Centennial Coal

Environmental Impact Statement

Western Coal Services Project

July 2013

Prepared by:

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Report Number: PR110910
Version/Date: Final / July 2013

Prepared for:

SPRINGVALE COAL PTY LTD

Document Status

Version	Purpose of Document	Orig	Review	Review Date
Draft 1	Draft for Client review	TP	RD	
Draft 2	Draft for Client review	TP	RD	
Draft 3	Draft for Client review	TP/KH/TM	RD	
Draft 4	Draft for Client review	TP/RD	DR	
Draft 5	Final Draft for Client review	RD	SG/VD/RD	
Final	Lodgement with DPI	RD	SG/VD/RD	03.05.13
Final	Lodgement with DPI for exhibition	RD	SG/VD/RD	29.07.13

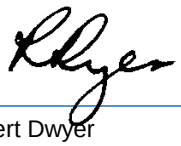
Approval for Issue

Name	Signature	Date
Rob Dwyer		29.07.13

Submission of Environmental Impact Statement (EIS) prepared under the *Environmental Planning and Assessment Act 1979*

EIS Prepared by	
Name	Robert Dwyer
Qualifications	BSc, Grad Dip URP.
Address	241 Denison Street, Broadmeadow NSW 2292
In respect of	Springvale Coal Pty Limited (Springvale Coal) is seeking approval to: ▪ Upgrade the existing facilities and infrastructure within the Springvale Coal Services Site to provide a total processing capacity of up to 7 Mtpa; ▪ Construct processing infrastructure including additional conveyors and transfer points and other coal handling requirements to cater for the upgraded Washery facility within the existing disturbance footprint of the Springvale Coal Services Site; ▪ Extend and enlarge an existing reject emplacement area on the Springvale Coal Services Site to enable sufficient reject disposal capacity for a 25 year life; ▪ Increase the utilisation of the return side of the existing Overland Conveyor (OL) system to enable up to 6.3 Mtpa of coal to be delivered to Lidsdale Siding; ▪ Construct a private Link Haul Road linking the Springvale Coal Services Site with the existing private haul road from Angus Place Colliery to Mt Piper Power Station; ▪ Improve the current water management systems on the Springvale Coal Services Site by separating clean and dirty water streams prior to either reuse or discharge off site; ▪ Integrate the existing approved transport and processing of coal at Springvale Coal Mine and Angus Place Colliery into the one consent; ▪ Integrate the remaining rehabilitation, monitoring, water management and reporting requirements associated with the Lamberts Gully Open Cut Mine, which occupies the Springvale Coal Services Site; and ▪ Allow continued use of all existing approved infrastructure, facilities and activities associated with the transport and processing of coal from each mine gate and the point of delivery to the Springvale Coal Services Site. This infrastructure includes the existing conveyors, private haul roads, Kerosene Vale Stockpile Area, reject emplacement areas (REA), services, access roads, car parks and buildings.
Development Application	
Proponent Name	Springvale Coal Pty Limited (Springvale Coal)
Proponent Address	Locked Bag 1002, Wallerawang NSW 2845
Land within area subject of the EIS	**Centennial Fassifern Pty Ltd**
	Lots 2 and 4 DP 260621
	Lot 1 DP 386554
	Lot 3 DP 542432
	Lots 32, 41, 57 and 351 DP 751636
	Lot 51 DP 751 651
	Lots 20, 24 and 44 DP 827626
	Lot 20 DP 877752
	Lots 1 and 4 DP 1139982
	Centennial Springvale Pty Ltd and Springvale Kores Pty Ltd
	Lot 1 DP 88503
	Lots 1 and 2 DP 126483

EIS Prepared by	
	Lot 13 and 357 DP 751651
	Lot 501 DP 825541
	Lot 2 DP 835651
	Coal Link>Pty Ltd
	Lot 1 DP 825887
	Council of the City of Lithgow
	Lot 42 DP 751636
	Lot 1 DP 1049809
	Lot 1 DP 1127043
	Delta Electricity
	Lot 191 DP 629212
	Lots 1 and 2 DP 702619
	Lot 67 DP 751636
	Lot 1 DP 803655
	Lots 9 and 15 DP 804929
	Lot 1 DP 825124
	Lots 40, 47, 49, 51 and 52 DP 827626
	Lots 3 and 5 DP 829137
	Lot 101 DP 829410
	Lot 16 DP 855844
	Lot 2 DP 1018958
	Lots 1 and 5 DP 1087684
	Lot 228 DP 1131953
	Lots 10 and 11 DP 1139978
	Lots 2 and 3 DP 1139982
	Lot 103 DP 1164619
	Enhance Place Pty Ltd
	Lots 32, 35, 36, 37, 38 and 39 DP 827626
	Lot 10 DP 877753
	Lot 29 DP 1096381
	State of NSW / Ben Bullen State Forest
	Lot 70 DP 751636
	Lot 502 DP 822541
	Lot 7005 DP 1026541
	Ivanhoe Coal Pty Ltd
	Lot 2 DP 567915
	Lots 16, 174, 375 and 385 DP 751651
	Lot 101 DP 1137972
	Private Owner (Janette Winifred Hunt)
	Lot 371 DP 751651
	Lidsdale Holdings Pty Ltd
	Lot 28 DP 827626
	State Rail Authority

EIS Prepared by	
	Lots 1 and 8 DP 252472
Environmental Impact Statement	
	An EIS is attached.
Declaration	
Certificate	I certify that I have prepared the contents of this EIS and to the best of my knowledge ▪ It is in accordance with clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000;* ▪ It contains all available information that is relevant to the Environmental Assessment (EA) of the development to which this statement relates; and ▪ It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.
Signature	
Name	Robert Dwyer
Date	29th July 2013

Executive Summary

Introduction and Overview

The Western Coal Services Project, comprising of the Springvale Coal Services Site, the existing private haul roads between Angus Place Colliery and Mount Piper and Wallerawang Power Stations referred to as the Angus Place – Mount Piper Haul Road and the Angus Place – Wallerawang Haul Roads, the existing OLs linking Springvale Coal Mine, Wallerawang and Mt Piper Power Stations, the Springvale Coal Services Site and Lidsdale Siding and the existing Kerosene Vale Coal Stockpile Area located along the Wallerawang Haul Road, all as depicted in **Figure 1**, is located approximately 15 km north of Lithgow, NSW. The Springvale Coal Services Site is an existing approved facility and receives coal by overland conveyor (OL) from the nearby Springvale Coal Mine and provides coal storage, handling and processing functions. The Angus Place – Mount Piper Haul Road and Angus Place – Wallerawang Haul Road are existing approved facilities under Angus Place Colliery.

RPS was commissioned by Springvale Coal Pty Ltd (Springvale Coal) to undertake investigations and prepare an EIS in relation to the Project Application Area (PAA), as provided in **Figure 1**. Land within the PAA is subject of the Western Coal Services Project (the "Project") and EIS. The PAA is owned by Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd under a joint venture arrangement. Springvale Coal is the manager of the Springvale joint venture and is the Proponent for the purposes of the Development Application for the Project.

An application and request for Director-General Requirements (DGRs) for the Project was lodged in September 2012 by Springvale Coal to the Department of Planning and Infrastructure (DPI). The DGRs for the Project (SSD 5579) were issued on 6th November 2012.

Subsequently, this EIS has been prepared and supported by specialist consultant studies utilising a risk-based approach for the identification, assessment and management of potential environmental impacts associated with the Project. These assessments and the EIS have been undertaken to meet the requirements provided by the DGRs and issues identified by other agencies including issues identified during the consultation process undertaken for the Project. The Project is outlined further below.

Project Description

The PAA, as identified in **Figure 1** of the EIS, contains the existing elements:

- Springvale Coal Services Site;
- Wallerawang Haul Road, which links Angus Place Colliery to Wallerawang Power Station;
- Mt Piper Haul Road, which links Angus Place Colliery to Mt Piper Power Station;
- Springvale OL, which links Springvale Coal Mine to Mt Piper Power Station, with off-takes to Wallerawang Power Station and the Springvale Coal Services Site; and
- Kerosene Vale Coal Stockpile Area;

Springvale Coal is seeking an approval of the Development Application (DA) and EIS under Part 4 of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) to:

- Upgrade the existing Washery, and supporting infrastructure within the Springvale Coal Services Site by constructing a new Washery adjacent to the existing facility that will remain operational to provide a total processing capacity of up to 7 Million tonnes per annum (Mtpa);

- Construct processing infrastructure including additional conveyors and transfer points and other coal handling requirements to cater for the upgraded Washery facility within the existing disturbance footprint of the Springvale Coal Services Site;
- Extend and enlarge the existing Reject Emplacement Area (REA) on the Springvale Coal Services Site to enable sufficient reject disposal capacity for a 25 year life;
- Construct a private Link Haul Road, approximately 1.3 km in length, linking the Springvale Coal Services Site with the existing private haul road from Angus Place Colliery to Mt Piper Power Station. The private Link Haul Road will cross a section of the existing Pine Dale Mine operation and over the Castlereagh Highway via the construction of a road bridge;
- Improve the current water management systems on the Springvale Coal Services Site by separating clean and dirty water streams prior to either reuse or discharge off site;
- Integrate the remaining rehabilitation, monitoring, water management and reporting requirements associated with the now closed Lamberts Gully Open Cut Mine which occupies the Springvale Coal Services Site;
- Integrate the existing approved transport of coal from Springvale Coal Mine and Angus Place Colliery into the one consent;
- Increase the utilisation of the return side of the existing OL system to enable up to 6.3 Mtpa of coal to be delivered to Lidsdale Siding; and
- Continue use of all existing approved infrastructure, facilities and activities associated with the transport and processing of coal from each mine gate and the point of delivery to the Springvale Coal Services Site. This infrastructure includes the existing conveyors, private haul roads, Kerosene Vale Stockpile Area, REAs, services, access roads, car parks and buildings.

Project Benefits

The EIS outlines a range of positive benefits that will accompany the Project at a local, regional and state level. Notable benefits include, but are not limited to, the following:

- Improved water quality being discharged from the Springvale Coal Services Site as well as a reduction in the volume of process water discharged. This will result in an overall improvement in water quality and aquatic habitat condition for aquatic biota in the length of Wangcol Creek that is adjacent to the Springvale Coal Services Site;
- Improved understanding of groundwater conditions including a better understanding of the groundwater movement between Wangcol Creek and the Springvale Coal Services Site;
- The removal of the eastern REAs at the Springvale Coal Services Site thus reducing noise and visual impacts on the main residential area of Blackmans Flat;
- Improved understanding and management of Aboriginal Heritage issues on the Springvale Coal Services Site;
- Continued opportunities for local residents in relation to employment and training;
- The sustaining of employment at the mines that the Springvale Coal Services Site services. At present, Angus Place Colliery has an approved workforce of 225 permanent employees and an additional 75 contractors. Springvale Coal Mine has 270 permanent employees. The sustainability of employment at Angus Place Colliery will be enhanced by the new infrastructure provided by the Project;
- Provision of thermal coal for domestic and international customers to provide for the energy requirements of the people of NSW and elsewhere;
- The Project is projected to generate a benefit to the NSW and regional community of approximately $374 million;

- Centennial's operations, and the broader mining industry, are critical to the economic sustainability of the Lithgow Local Government Area and the surrounding region. This role is acknowledged in the Lithgow City Council Economic Development Strategy; and
- Following direct engagement with the residents in the main residential area of Blackmans Flat, the development of a strategy to manage the cumulative impacts resulting from a number of incompatible land uses.

Consultation

Springvale Coal has established and maintains an open and two-way communication with neighbours, authorities and stakeholders. As part of the preparation of the EIS, a dedicated Stakeholder Engagement Plan was established for the Project and opportunities for input into the EIS process was provided as part of a transparent process to identify and address key issues for the Project. The Stakeholder Engagement Plan and strategies arising from it were developed utilising the services of specialist social planners.

These opportunities are described in Section 6 of the EIS and included:

- Community Information sessions;
- Letter box-drop of leaflets;
- A series of articles and advertisements in the local paper;
- Direct engagement with residents in the main residential area of Blackmans Flat;
- Meetings with key government stakeholders including the DPI; and
- Consultation with the local Aboriginal Community as part of a specialist Cultural Heritage Assessment (CHA).

Key Environmental Issues and Assessment

Potential environmental issues associated with the Project were identified through the risk-based and consultative approach as outlined above. A Preliminary Broad-Brush Risk Assessment (BBRA) for the Project was completed in April 2011, supplemented by a further BBRA in November 2011. Both were carried out by an appropriate risk team specifically assembled for the Project with the aim of identifying all issues to be considered by the EIS. Subsequently, environmental aspects were prioritised for assessment and management for the Project as outlined in **Table (i).**

While the information presented within the EIS and in the appended specialist assessments should be read in its entirety, **Table (i)** below provides a very broad overview of the key outcomes of the EA.

Table (i) Broad Overview of Environmental Assessment Issues

Environmental Issue	Overview of Key Findings
Noise and Vibration	▪ Modelled predictions indicate that the Project will comply with the Industrial Noise Policy (INP) Project Specific Criteria in the locality of Lidsdale, Wolgan Road and Springvale. ▪ Modelled predictions indicate that the Project will comply with short term noise goals of the draft conditions of consent for the Lidsdale Siding Project (MP 08_0223). ▪ Modelled predictions indicate that there will be likely residual noise impacts above the INP Project Specific Criteria at some receptors at the main residential area of Blackmans Flat. ▪ Sleep disturbance modelling indicates that maximum noise levels generated by the Project will comply with sleep disturbance goals at the closest, potentially most affected receptors in Wallerawang, Lidsdale and Springvale. Predicted maximum noise levels from the Project at the main residential area of Blackmans Flat and Wolgan Road receptors show potential exceedance of the noise goals but are below a level that is considered to cause awakening reactions. ▪ During the night period the modelling indicates the cumulative amenity noise level exceeds the acceptable level of 40 dBA at Blackmans Flat (Locations B2 and B17), refer to **Figure 23** of EIS for these locations, but remains below the maximum noise level of 45 dBA. ▪ With the exception of some residential lots at Blackmans Flat (B2, B4 B5 and B6), refer to **Figure 23** of this EIS, modelled predictions for the construction phase of the Project indicate that noise emission from construction will comply with the noise affected management level. However, the predicted construction noise levels are below the highly noise affected level for the scenarios considered. ▪ Predicted vibration levels for the construction and operation of the Project are significantly below damage and annoyance risk criteria at all times. ▪ Mitigation measures that will be implemented include the removal of the eastern REAs at the Springvale Coal Services Site, the construction of the Link Haul Road in the location as depicted in **Figure 1**, material haulage will be managed to maintain compliance with the approved noise criteria on the private Haul Roads, and reduction of truck movements along Mt Piper Haul Road during prevailing noise enhancing weather conditions in order to meet the nominated Project Specific Noise Criteria.
Air Quality	▪ Modelled predictions indicate acceptable air quality impacts at all privately owned receptors. ▪ Mitigation measures outlined in the Springvale Coal Services Pollution Reduction Program (PRP) 2012 will be implemented.

Environmental Issue	Overview of Key Findings
Water Balance, Surface Water and Geomorphology	▪ The existing coal processing operation uses 0.885 Megalitres (Ml) per day which will increase to a total of 2.725 Ml per day with the increase coal processing and dust controls. The project has incorporated increased water recycling capability to remove and recover water from the tailings. This will result in approximately 1.5 ML per day of water recovery and recycling and only 0.34 Ml per day of make-up water required. ▪ The project provides for an additional 15 Ml of pollution control storage, additional drainage collection and separation of the process water circuit water, completion of the separation of the Lamberts Gully drainage line from disturbed areas and additional rehabilitation commitments. This work will provide improvements in the discharge quality leaving the site and a reduction in the volume of process water discharge. ▪ It is proposed to relocate the Licensed Discharge Point (LDP) to the spillway of Cooks Dam which will represent the final discharge from the operational footprint. The existing location at the site entrance includes a mixture of natural flows from the Lamberts Gully catchment and process water discharges. This location would be converted to a monitoring point to obtain data on the effectiveness of the upgraded water management system. ▪ The Water Balance modelling has shown that the Springvale Coal Services site will still be a net producer of water during average rain years but there will be a water deficit for 20 to 30% of days in future. During low rainfall periods and drought conditions, water makeup will be provided from the Springvale Mine via a water supply pipeline along the overland conveyor. ▪ The Geomorphology Assessment identified measures needed to protect Wangcol Creek during both construction and operation of the private haul road link. These measures included scour protection and sediment controls and form part of the project.
Groundwater	▪ The groundwater regime at the Springvale Coal Services site is complex due to the interaction between old underground and open cut mine workings. A groundwater model was established and predicted that as a result of the Project there will be slightly higher groundwater inflow to the existing DML and Cooks Dams of around 7.7m^3/day (a net increase of 4.7m^3/day) following 25 years of reject emplacement in the designated area. This slight increase will occur as a result of increased direct recharge to high permeability backfilled areas as opposed to the current runoff and high evaporation from those areas. The increased groundwater flow does not represent a net loss of groundwater. ▪ Wangcol Creek down gradient from the Springvale Coal Services site is a losing creek, that is, surface flow in the creek enters the groundwater system rather than the creek being fed by groundwater. ▪ Additional groundwater monitoring bores will be installed in order to better understand the groundwater movement between Wangcol Creek and the Springvale Coal Services Site.
Social	▪ According to the Social Impact Assessment (SIA), conventional measures to reduce the impacts (noise, visual, dust) will not address the cumulative impacts that have occurred over many years for the main residential area of Blackmans Flat. Lithgow Council's Land Use Strategy acknowledges this and has identified that the future zoning of Blackmans Flat will need to recognise the dominant land use – which is heavy industry, therefore removing opportunities to protect residential amenity. ▪ A strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents has been developed. This strategy will mitigate the impacts of the Project related to noise, dust and visual amenity on the main residential area of Blackmans Flat. The Strategy will result in an individual agreement with each private property owner in the main residential area of Blackmans Flat and allow for the Project to be developed to its full potential and positively contribute to the long term viability of the industry in the region.

Environmental Issue	Overview of Key Findings
Terrestrial Ecology	▪ There are no significant impacts on the ecology of the Springvale Coal Services Site, including vegetation communities, threatened flora and fauna or endangered ecological communities that are known or expected to occur. ▪ There are no significant impacts on threatened species or Endangered Ecological Community (EECs) listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act 1995), or Matters National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).
Aquatic Ecology	▪ The Coxs River at the junction of Wangcol Creek plus Wangcol Creek and its sub-catchment tributaries (Neubecks Creek, Huon Gully and Lamberts Gully) are listed as "Key Fish Habitat" (KFH) under the *Fisheries Management Act 1994,* (FMA Act). ▪ Whilst there are no threatened aquatic species as listed under the FMA or *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) ,and none are expected, both Wangcol Creek and Coxs River support native fish and provide fish passage upstream past the Springvale Coal Services Site. ▪ Both Wangcol Creek and Coxs River are classified as Class 2 “Moderate Fish Habitat” under the NSW Department of Fisheries’ stream classification scheme. ▪ The proposed works would maintain and improve the KFH and Class 2 features of Wangcol Creek and of the Coxs River below the confluence and the positive impact of works on the Springvale Coal Services Site will be in line with the Hawkesbury-Nepean Catchment Management Authority (HNCMA) Action Plan 2007-2016 for the upper Coxs River catchment. ▪ There are no significant impacts on adjacent aquatic habitats as impacts will be satisfactorily managed and mitigated via construction and operational Environmental Management Plans (EMPs).
Visual	▪ The Visual Impact Assessment (VIA) states that the Link Haul Road overpass is likely to create ‘visual intrusion’ and further compound the visual sensitivity of the area. However the existing Pine Dale mine site, including the existing and likely expanded overburden emplacement bund, and the Mt Piper Power Station site are considered more visually prominent and contributing more to visual intrusion than the proposed activities within the Springvale Coal Services Site. ▪ Impacts associated with the Link Haul Road overpass will be satisfactorily managed by landscaping and material selection whilst impacts associated with the extended REA will be satisfactorily managed by prompt staged rehabilitation.
Cultural Heritage	▪ A total of nine known Aboriginal sites (three existing and six new sites) are located on the Springvale Coal Services Site. Of these sites, none are at high risk of impact, one is at low-moderate risk, and eight are at low (remote) risk of impact. All Aboriginal heritage on the Springvale Coal Services Site will be managed under a Cultural Heritage Management Plan (CHMP), the Aboriginal aspects of which will be developed in consultation with the Aboriginal Stakeholders. ▪ There are no impacts on non-Aboriginal Heritage items. No mitigation measures are required.
Traffic	▪ The Project will result in a slight increase in light vehicles entering and exiting the Springvale Coal Services Site due to additional staff numbers. There will also be a slight increase in heavy vehicles during the construction phase. To offset this, there will be no coal transported on the public road network after construction is complete. ▪ Interaction of coal haulage with traffic using public roads will be avoided by the continued use of the existing private haul roads, utilised to transport coal from Angus Place Colliery to Mt Piper and Wallerawang Power Stations. ▪ All road intersections, including the Springvale Coal Services access road intersection are considered adequate to cope with the existing and projected traffic levels. ▪ The Link Haul Road will be constructed in accordance with AUSROADS Guidelines and all construction sites will prepare and implement a Construction Traffic Management Plan.

Environmental Issue	Overview of Key Findings
Agriculture	▪ There are no significant impacts on current land use or agriculture arising from the Project.
Greenhouse Gas	▪ The Project's contribution to projected climate change, and the associated impacts, would be in proportion with its contribution to global GHG emissions. Average annual Scope 1 emissions from the Project (0.005 million tonnes [Mt] CO2-e) would represent approximately 0.001% of Australia's commitment under the Kyoto Protocol (591.5 Mt CO2-e) and a very small portion of global greenhouse emissions, given that Australia contributed approximately 1.5% of global GHG emissions in 2005 (Commonwealth of Australia, 2011).
Economics	▪ The sustainability of employment at Angus Place Colliery is enhanced by the new infrastructure provided by the Project. ▪ Mining is a crucial contribution to the economy of the region and beyond; and ▪ Continued opportunities for local residents in relation to employment and training.
Contamination	▪ Phase 1 Environmental Site Assessments (ESAs) have been carried out for the Springvale Coal Services Site and the Kerosene Vale Stockpile Area, with each Assessment recommending Phase 2 EAs to be carried out.
Hazards	▪ Of the hazards assessed (including bushfire, unauthorised access, hazardous materials, and traffic) the Project is not expected to result in an increased environmental or safety risk.
Waste	▪ All waste generated during construction on the Springvale Coal Services Site will be reused or removed from the work areas at regular intervals by a suitably qualified contractor and disposed of as required at an approved waste facility. ▪ Waste generated during operation of the Project will be managed in accordance with existing Waste Management protocols.

Environmental Safeguards, Management and Mitigation Measures

Further to the management and mitigation measures outlined in **Table (i)** above, the existing operations and infrastructure within the PAA operates under an established Environmental Management System (EMS) that has been developed in accordance with the Centennial EMS Framework.

The EMS has been developed and implemented to ensure the effective management of environmental issues and compliance with all regulatory requirements. The EMS incorporates a number of Environmental Management Plans (EMPs) that are designed to assist in meeting community and regulatory expectations. Current Management Plans, applicable to the Springvale Coal Services Site, Existing Haul Roads, and Kerosene Vale Stockpile Area, are relevant to the Project.

The Springvale Coal Services Site has developed the following Plans, Programs and Procedures:

- Rehabilitation and Landscape Plan;
- Water Management Plan;
- Dust Management Plan;
- Best Practice Dust Management PRP;
- Noise Management Plan;
- Erosion and Sediment Control Plan;
- Bushfire Management Plan;
- Hazardous Substances Management Plan;
- Slope Stability Management Plan; and
- Reject Emplacement Procedure.

Management Plans and Protocols for the existing Haul Roads, relevant to the Project include:

- Wallerawang Haul Road Inspection Protocol;
- Wallerawang Haul Road Landscape Management Plan; and
- Noise Management Plan (Haul Roads).

Management Plans and PRPs for the Kerosene Vale Stockpile Area, relevant to the Project include:

- Draft Kerosene Vale Rehabilitation Plan; and
- Angus Place Colliery Site Specific Particulate Matter Control - Best Practice Dust Management PRP (Angus Place PRP).

Additionally, environmental monitoring at the Springvale Coal Services Site is also conducted in accordance with Environmental Protection Licence (EPL) 3697.

A Statement of Commitments has also been developed for this EIS to address aspects requiring further action to mitigate potential impacts, including updating (or development) of management plans where required for various aspects.

For the Springvale Coal Services Site the following Management Plans, Program and Procedure will require updating as a result of the Project:

- Rehabilitation and Landscape Plan;
- Water Management Plan;
- Dust Management Plan;
- Best Practice Dust Management PRP;
- Noise Management Plan;
- Erosion and Sediment Control Plan;
- Slope Stability Management Plan; and
- Reject Emplacement Procedure.

For the existing Haul Roads the Noise Management Plan (Haul Roads) will be updated, whilst the Draft Kerosene Vale Rehabilitation Plan and the Angus Place PRP will also require updating.

The Statement of Commitments will also require the development of management plans for various aspects including Construction Environmental Management, Aboriginal (Cultural) Heritage and a rehabilitation monitoring program for the rehabilitation of the REA on the Springvale Coal Services Site.

Justification and Conclusion

The Project has been developed to provide flexibility to respond to changing market trends. It provides both security for the operations of Angus Place Colliery and Springvale Coal Mine, and an opportunity for future projects in the local area. The Project will also provide additional flexibility to access to both the domestic and export markets.

The linkage of the Springvale Coal Services Site to the existing Lidsdale Siding (with recent approval for upgrading as per Project Approval 08_0223) creates synergies for Centennial's coal operations and reduces the potential impacts on the community through the utilisation of existing infrastructure and the upgrading of these facilities that will further reduce those environmental impacts. Community benefits of private road haulage are maintained with the proposed Link Haul Road from the existing Angus Place to Mt Piper Haul Road to the Springvale Coal Services Site.

The potential environmental impacts of the Project have been kept to a minimum through:

- The confinement of new infrastructure predominately to existing disturbed areas of the Springvale Coal Services Site;
- Obtaining a detailed understanding of the issues and potential impacts for the Project using a risk-based approach to appropriately identify and assess relevant environmental aspects (refer to Section 9 of this EIS). The multi-disciplinary assessment and consultation has been to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted;
- Implementation of existing management plans employed at the Springvale Coal Services Site, existing Haul Roads and Kerosene Vale Stockpile Area to avoid, minimise, mitigate, or manage potential impacts, with commitment to update those or develop new plans where required, refer to Section 10 of this EIS; and
- Implementation of the Statement of Commitments, refer to Section 10 of this EIS.

Springvale Coal has shown a commitment to the principles of Ecologically Sustainable Development (ESD) and understands that social, economic and environmental objectives are interdependent. Springvale Coal acknowledges that a well designed and effectively managed operation will avoid significant and/or costly environmental impact or degradation. The Project design and the suite of existing EMPs have been developed on a risk-basis to appropriately identify, mitigate and manage environmental risk. These demonstrate environmental due diligence and provide procedures for on-going management and monitoring of the operation in-line with the objectives of ESD.

The socio-economic output of the Project, particularly in terms of direct and indirect employment and flow-on benefits, is anticipated to make a positive contribution to the Lithgow LGA and the surrounding region, and as a continuing operation, the Project will not significantly influence social and community infrastructure requirements.

Accordingly, it is considered that the Project will meet environmental performance and socio-economic benefit requirements in order for the Project to be considered for approval.

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1.0 Introduction

On behalf of Springvale Coal Pty Limited (Springvale Coal), RPS Australia East Pty Ltd (RPS) has prepared this EIS in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to assess the environmental impacts of the Western Coal Services Project (the Project). The Project will support the ongoing operations of Springvale Coal Mine, Angus Place Colliery and the Springvale Coal Services Site.

The PAA, the subject of this EIS, comprises land affected by Consolidated Coal Lease (CCL) 704 and CCL 733, and Mining Lease (ML) 1319, ML 1323, ML 1448, ML 1569 and ML 1578. It is located approximately 15 km north of Lithgow in New South Wales (NSW). The PAA is owned by Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd under a joint venture arrangement. Springvale Coal is the manager of the Springvale joint venture and is the Proponent for the purposes of the Development Application for the Project.

1.1 Project Overview

1.1.1 Objectives of this Report

This EIS has been prepared in accordance with Part 4 of the NSW EP&A Act to accompany a DA for the Project. The Project is a ‘‘State Significant Development’’ (SSD) to which Division 4.1 of Part 4 of the EP&A Act applies in accordance with the *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional Development SEPP).

This EIS considers the potential environmental impacts of the Project in accordance with clauses 6 and 7 in Schedule 2 of the NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), and the Director-General’s Requirements (DGRs) issued by the NSW Department of Planning and Infrastructure (DPI) on 6 November 2012 as contained in **Appendix 1**. The DGRs were issued in accordance with clause 3 of Schedule 2 of the EP&A Regulation. A summary of the DGRs is provided in Section 9.3.

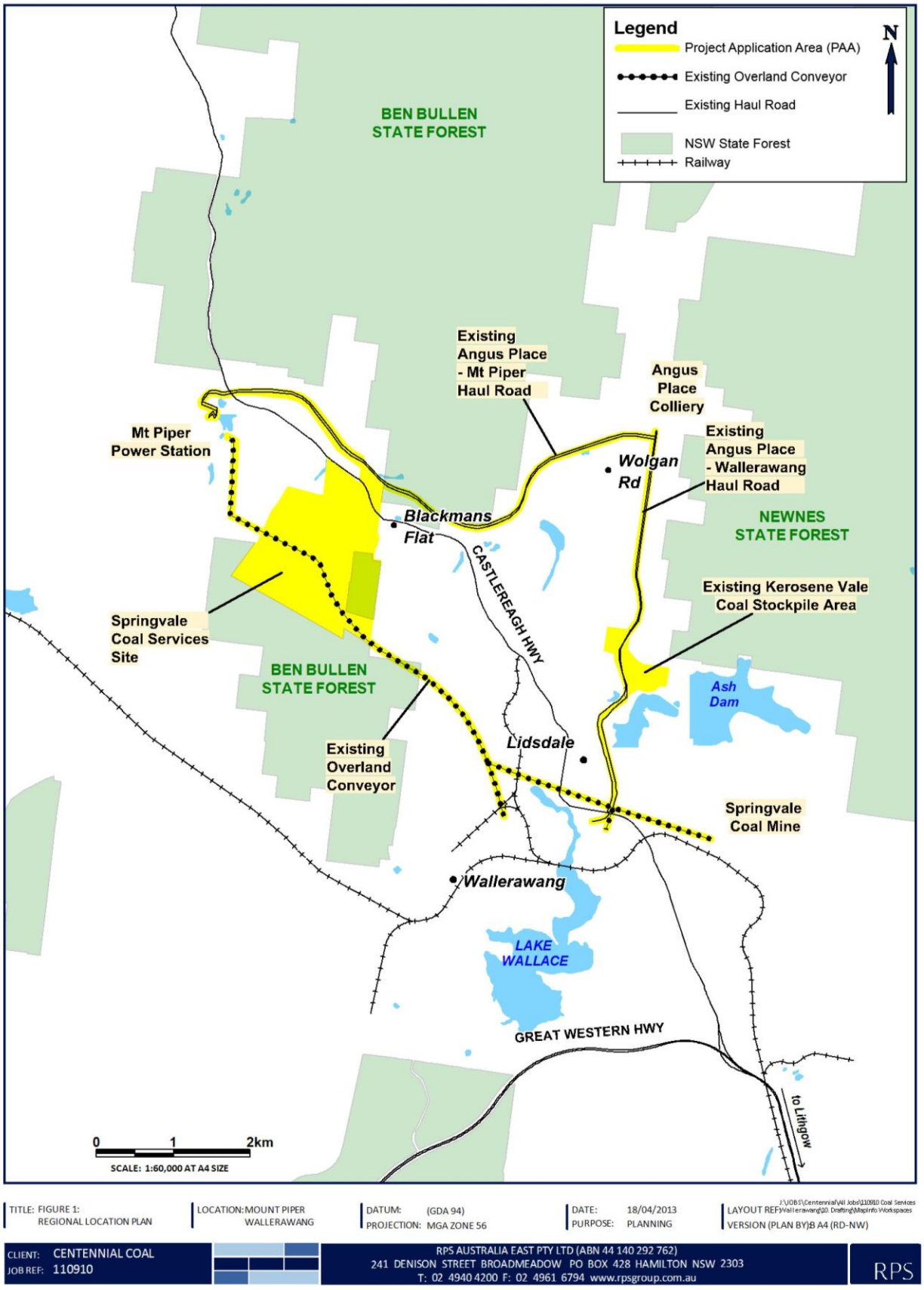
1.1.2 Background

The regional location of the PAA is shown in **Figure 1** and can be described as approximately 15 km north of Lithgow. The largest land component of the PAA, the Springvale Coal Services Site, is approximately 4 km north-west of Lidsdale, approximately 2 km south-east of the Mt Piper Power Station and approximately 5 km north of the town of Wallerawang.

The Springvale Coal Services Site is an existing approved facility under the Springvale Coal Mine development consent (DA 11/92). It consists of a coal handling and processing plant (Washery), reject and tailings emplacement facilities, and a coal distribution network of conveyors from the existing Springvale Coal Mine to both the Wallerawang and Mt Piper Power Stations and from the Springvale Coal Services site to Lidsdale Siding for export. The PAA also includes the existing and approved private haul roads and the Kerosene Vale Coal Stockpile Area as shown in **Figure 1.** All existing facilities and activities within the PAA, as described in Chapter 3, as well as the proposed works described in Chapter 4, form the Western Coal Services Project.

A detailed description of the existing operations that are carried out within the PAA is provided in Section 3 of this EIS.

Figure 1 Regional Location Plan



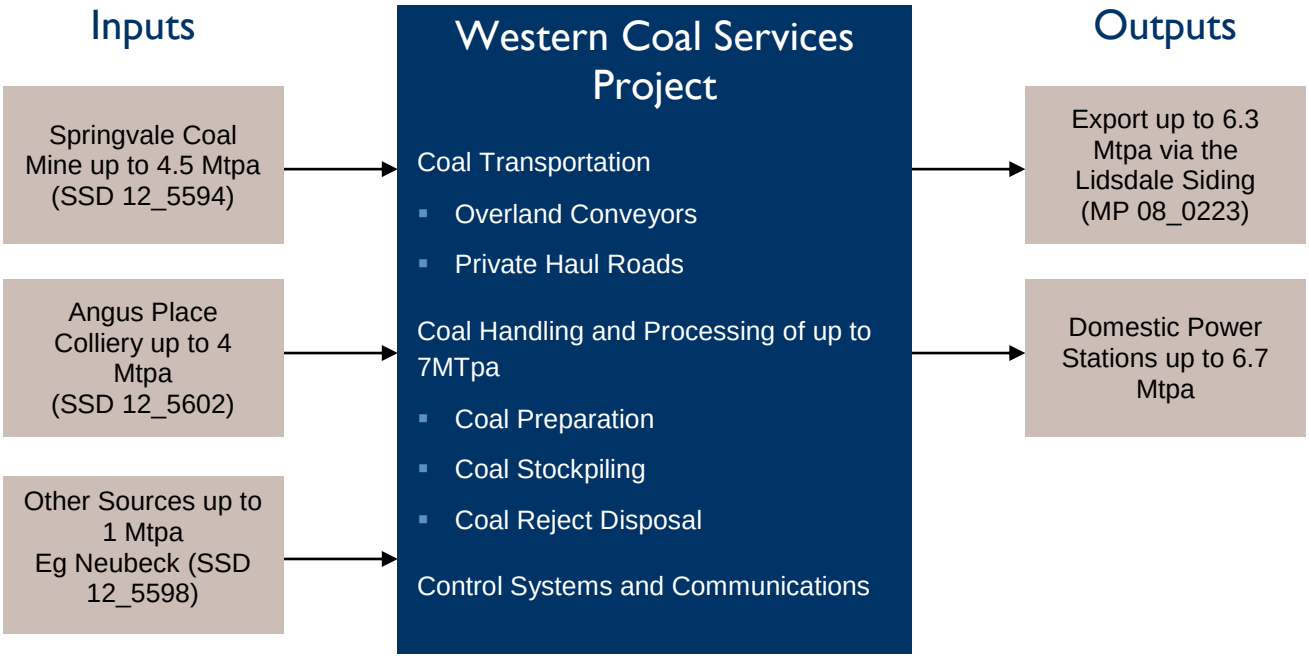
1.1.3 Project Summary

Centennial has developed a long-term strategy for its future operations in the Western Coalfield. This strategy is in response to future marketing opportunities for both domestic and export coal sales. The strategy centres on the transport and processing of coal from both Springvale Coal Mine and Angus Place Colliery, but also facilitates receipt of coal supplies from other areas.

In line with the Centennial strategy the Project will involve building an additional Washery adjacent to the existing Washery within the Springvale Coal Services Site, linking the facility to the Angus Place Colliery via a Link Haul Road, and separating the transport and logistics function of the facility from the source mines.

Maximum coal that could be received by the Project is 9.5 Mt per annum (Mtpa) representing coal supplied from Springvale Coal Mine, Angus Place Colliery and other potential Centennial sources. The design of the Project enables up to 7.0 Mtpa to be washed with up to 6.3 Mtpa of export coal delivered to Lidsdale Siding via the existing overland conveyor system. An overview of the Project inputs and outputs has been provided in **Figure 2** below.

Figure 2 Overview of the Western Coal Services Project (SSD-5579)



The Project will provide the flexibility, not possible under existing approvals, to supply varying quantities of coal to either domestic or export markets. Product will be delivered by OL to Lidsdale Siding or private road or conveyor to Wallerawang and Mt Piper Power Stations. This Project does not cover the mining operations of the existing source mines or any future sources. These will be subject to separate applications as required.

The Project will have a life of 25 years.

The key objectives of the Project are to:

- Provide infrastructure to enable flexibility of supply to both domestic and export markets from Springvale Coal Mine and Angus Place Colliery and other Centennial operations within the Western Coalfield;

- Upgrade of the existing Coal Handling and Preparation Plant (CHPP) including Washery at the Springvale Coal Services Site; and
- Integrate into one approval the processing and distribution of coal from Springvale Coal Mine, Angus Place Colliery, and the Springvale Coal Services Site.

1.2 Director-General's Requirements

The DGRs for the Project were issued on 6 November 2012 and are provided in **Appendix 1**and discussed further in Section 9.3.

1.3 Project Consultants

This EIS was prepared by RPS with specialist input provided by a range of consultants and the Western Coal Project Team, who provided input into project design, alternatives and justification, preliminary hazard analysis, environmental risk assessment, background data, resource economics, consultation, rehabilitation, remediation and mitigation.

A complete list of the assessment team is provided in **Table 11** in Section 9.2.

1.4 Document Structure

This EIS comprises a main text component and supporting studies, which include Appendices 1 to 15. An overview of the main text sections is presented below:

Section 1	Provides an introduction to the Project and this EIS;
Section 2	Provides a detailed description of the Project Application Area and surrounds;
Section 3	Provides a detailed description of the existing operations;
Section 4	Provides a detailed description of the Project;
Section 5	Describes the rehabilitation and mine closure measures for the Project;
Section 6	Describes the consultation undertaken with the stakeholders including government agencies (State and Federal) and local community;
Section 7	Outlines the statutory planning provisions relevant to the Project;
Section 8	Describes the Project Alternatives;
Section 9	Details the EA for the Project including an assessment of potential impacts; and a description of the measures that will be implemented to avoid, minimise, mitigate, offset, manage and/or monitor the potential impacts of the Project;
Section 10	Statement of Commitments;
Section 11	Justification and Conclusion; and
Section 12	Terms and Abbreviations

2.0 Site Description

2.1 Location

The location of the Project is shown in **Figure 1** and **Figure 3**. It is located to the west of the Blue Mountains in NSW, approximately 4 km north-west of Lidsdale which is located approximately 15 km north of Lithgow. Wallerawang is located approximately 5 km to the south of the site.

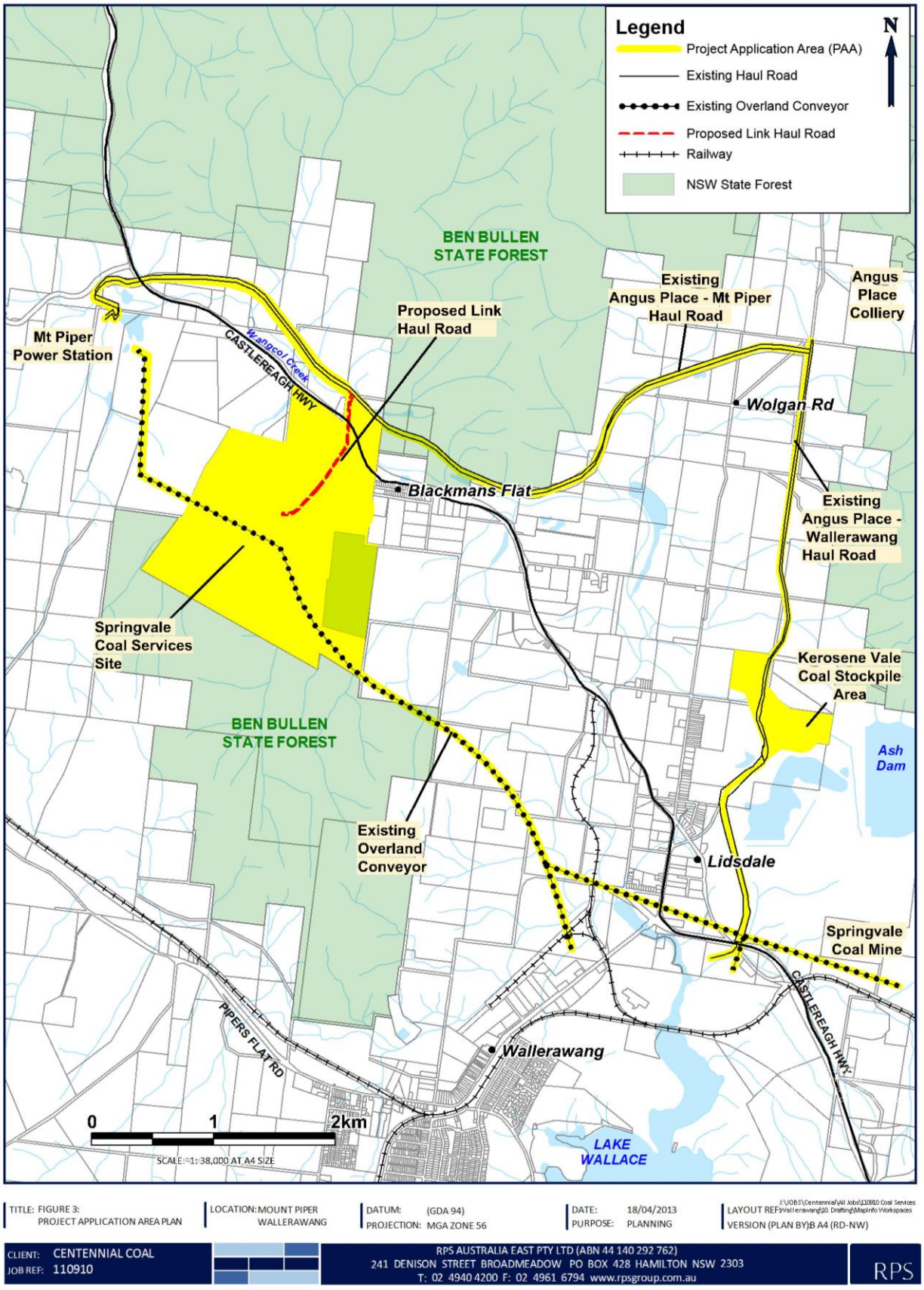
2.2 Project Application Area

The PAA includes those existing approved activities proposed to be incorporated into the development consent issued for this Project, as well as areas covering the physical works included as part of the Project. The PAA includes the Wallerawang Haul Road, which links Angus Place Colliery to Wallerawang Power Station, and the Mt Piper Haul Road, which links Angus Place Colliery to Mt Piper Power Station. The PAA also includes the Springvale OL, which links Springvale Coal Mine to Mt Piper Power Station, with off-takes to Wallerawang Power Station and the Springvale Coal Services Site.

In summary, the PAA includes the following:

- Springvale Coal Services Site including all existing and proposed infrastructure on CCL 773 and Mining Lease 1448;
- The existing private haul roads between Angus Place Colliery and Mount Piper and Wallerawang Power Stations referred to as the Angus Place – Mt Piper Haul Road and the Angus Place – Wallerawang Haul Road respectively;
- A proposed Link Haul Road between the Springvale Coal Services Site and the Angus Place – Mt Piper Haul Road, with an overpass of the Castlereagh Highway;
- The existing overland conveyors linking Springvale Coal Mine, Wallerawang and Mount Piper Power Stations, the Springvale Coal Services Site and Lidsdale Siding; and
- The existing Kerosene Vale Coal Stockpile Area located along the Wallerawang Haul Road.

Figure 3 Project Application Area (PAA)



2.3 Land Ownership

Land within the PAA is owned by various entities as listed in **Table 1** and shown in **Figure 4.**

Table 1 Land Ownership Table

Land within area subject of the EIS	
Centennial Fassifern Pty Ltd	
Lots 2 and 4 DP 260621	Lot 51 DP 751 651
Lot 1 DP 386554	Lots 20, 24 and 44 DP 827626
Lot 3 DP 542432	Lot 20 DP 877752
Lots 32, 41, 57 and 351 DP 751636	Lots 1 and 4 DP 1139982
Centennial Springvale Pty Ltd and Springvale Kores Pty Ltd	
Lot 1 DP 88503	Lot 501 DP 825541
Lots 1 and 2 DP 126483	Lot 2 DP 835651
Lot 13 and 357 DP 751651	
Coal Link>Pty Ltd	
Lot 1 DP 825887	
Council of the City of Lithgow	
Lot 42 DP 751636	Lot 1 DP 1127043
Lot 1 DP 1049809	
Delta Electricity	
Lot 191 DP 629212	Lot 101 DP 829410
Lots 1 and 2 DP 702619	Lot 16 DP 855844
Lot 67 DP 751636	Lot 2 DP 1018958
Lot 1 DP 803655	Lots 1 and 5 DP 1087684
Lots 9 and 15 DP 804929	Lot 228 DP 1131953
Lot 1 DP 825124	Lots 10 and 11 DP 1139978
Lots 40, 47, 49, 51 and 52 DP 827626	Lots 2 and 3 DP 1139982
Lots 3 and 5 DP 829137	Lot 103 DP 1164619
Enhance Place Pty Ltd	
Lots 32, 35, 36, 37, 38 and 39 DP 827626	Lot 29 DP 1096381
Lot 10 DP 877753	
State of NSW / Ben Bullen State Forest	
Lot 70 DP 751636	Lot 7005 DP 1026541
Lot 502 DP 822541	
Ivanhoe Coal Pty Ltd	
Lot 2 DP 567915	Lot 101 DP 1137972
Lots 16, 174, 375 and 385 DP 751651	
Private Owner (Janette Winifred Hunt)	
Lot 371 DP 751651	
Lidsdale Holdings Pty Ltd	
Lot 28 DP 827626	
State Rail Authority	
Lots 1 and 8 DP 252472	

2.4 Surrounding Land Uses

Land uses within, and surrounding, the PAA vary and include industrial, mining, power generation, residential, agricultural and forestry uses. Mt Piper Power Station is situated on land immediately west of the Springvale Coal Services Site, whilst the locality of Blackmans Flat, a collection of eleven (11) residential dwellings, is located east of the Springvale Coal Services Site. Pine Dale Coal Mine is located north of the Springvale Coal Services Site on the northern side of the Castlereagh Highway. A compartment of the Ben Bullen State Forest is located to the south of the Springvale Coal Services Site. However the main area of Ben Bullen State Forest occurs to the north of the Angus Place – Mt Piper Haul Road. The Newnes State Forest occurs to the east of the Angus Place – Wallerawang Haul Road and the Kerosene Vale Coal Storage area.

Land between the Springvale Coal Services Site and the village of Lidsdale and land containing the majority of the overland conveyors and private haul roads may be described as generally cleared grazing land with scattered trees and rural dwellings.

2.5 Topography, Drainage, Soils and Geology

The PAA is situated within the Coxs River Valley. Dominant landforms include the forested hills and slopes of the Ben Bullen State Forest. The terrain is described as an active mine site, predominantly open and undulating, located on the valley floor approximately at 940 m Australian Height Datum (AHD).

The Springvale Coal Services Site drains to Wangcol Creek which is located north of the Castlereagh Highway. Wangcol Creek drains into the Coxs River approximately 2.5 km east of the site. The Springvale Coal Services Site is bound by Lamberts Gully on the east and Huon Gully on the west, both of which drain northward to Wangcol Creek. All three water courses are depicted on the 1:25000 topographical map but only Wangcol Creek is formally named. Wangcol Creek flows into the Coxs River to the south of the Angus Place – Mt Piper Haul Road. The Coxs River flows generally south towards Wallerawang Power Station flowing beneath the overland conveyor from the Springvale Coal Mine to the Springvale Coal Services Site before discharging into Lake Wallace which is part of the water supply system for Delta Electricity.

Soils within the PAA have developed on the Illawarra Coal Measures and are naturally low in fertility. The soils have been subject to erosion, physical disturbance due to mining activities, and past overgrazing. The majority of soils are generally shallow and stony or contain coal material, particularly in higher elevations where the Irondale Seam outcrops. Salinity is not a limiting factor in soils at either the Springvale Coal Services site or within the wider PAA with the main limitation being low fertility and poor structure. However, there are two more developed soil types which are suitably structured, and of sufficient depth, for low intensity agricultural activities, these are structured loams and Gleyed podzolic soils, and Yellow Podzolic soils.

The main geological unit in the area is the Cullen Bullen Subgroup of the Illawarra Coal Measures which consists of the Katoomba Seam, Middle River Seam, Irondale Seam, Lidsdale Seam and Lithgow Seam. The Lithgow Seam is the main target for the underground mines in the district with the other seams above this being extracted in the open cut operations where they occur and economically viable. Above this sequence is Triassic Sandstone while the unit below the coal measures is the Shoalhaven Group consisting of the Berry Formation (siltstones and shales) and the Megalong Conglomerate. The more recent Quaternary alluvium deposits are associated with the Coxs River and associated tributaries including Wangcol Creek.

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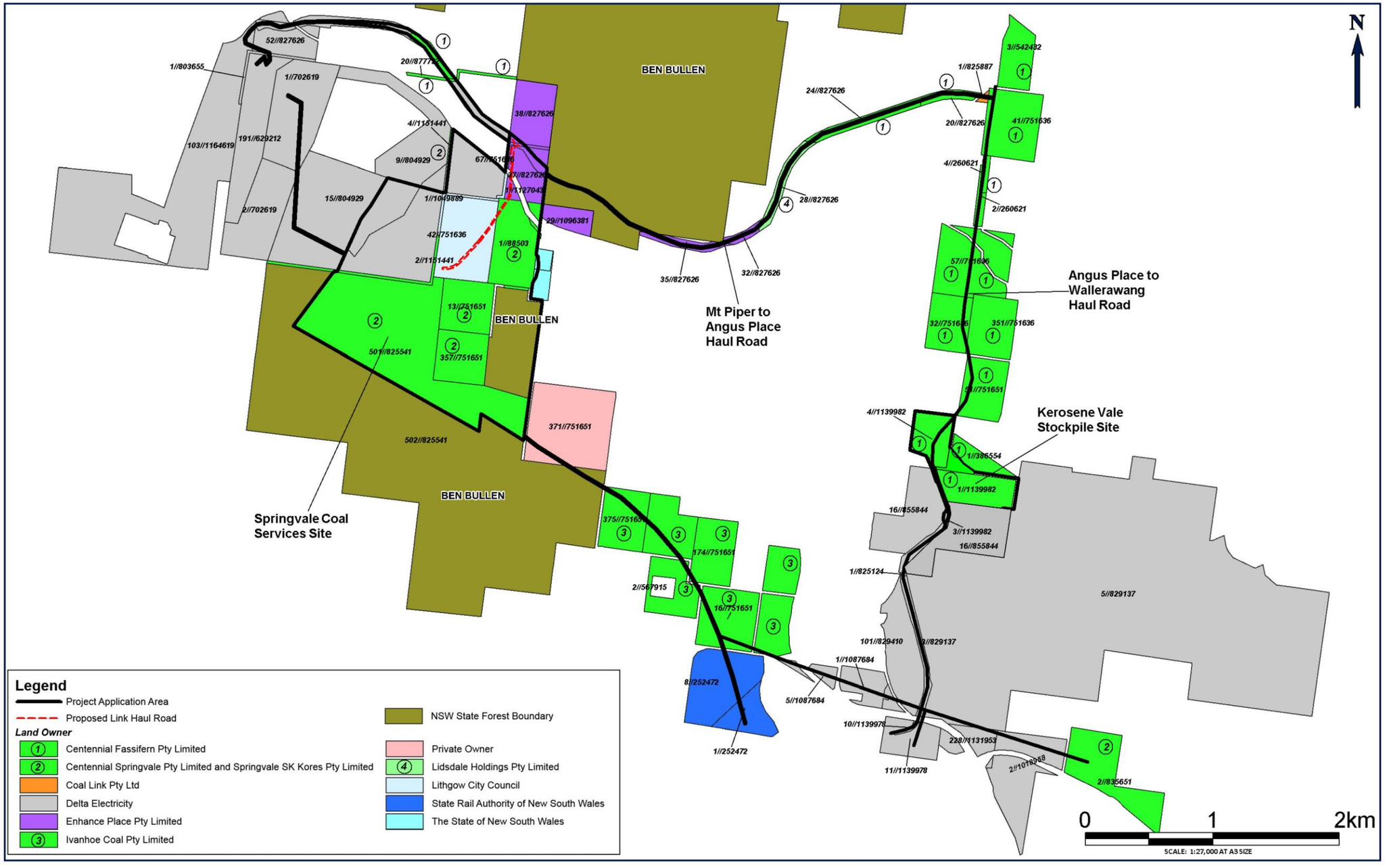
Figure 4 Land Ownership Plan



TITLE: FIGURE 4: LAND OWNERSHIP PLAN
LOCATION: WALLERWANG
DATUM: (GDA 94)
PROJECTION: MGA ZONE 56
DATE: 29/07/2013
PURPOSE: PLANNING
LAYOUT REF: J:\JOBS\Centennial\All Jobs\110910 Coal Services Wallerwang\10. Drafting\MapInfo Workspaces
VERSION (PLAN BY): G A3 (TP-RD-NW)

CLIENT: CENTENNIAL COAL
JOB REF: 110910

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

3.0 Existing Operations

3.1 Historical Operations

Open cut mining operations within the Springvale Coal Services Site commenced in 1940, extracting coal from the Lidsdale and Lithgow seams. Underground operations commenced in 1942 with the Western Main underground entries opposite the existing Washery, and the Eastern Main Mine being where the current tailings dams are located, near the main entrance to the Springvale Coal Services Site. **Figure 5** is a plan showing existing infrastructure and activities on the Springvale Coal Services Site. Further, **Figure 5** shows the location of the current tailings dam, referred to as the existing Co-Disposal REA. The previous underground workings mined the Lithgow seam until the 1990s. Between 1980 and 1994, three separate open cuts were developed which extracted the remaining coal south of the Castlereagh Highway, from Mount Piper Power Station to the Springvale Coal Services Site entrance.

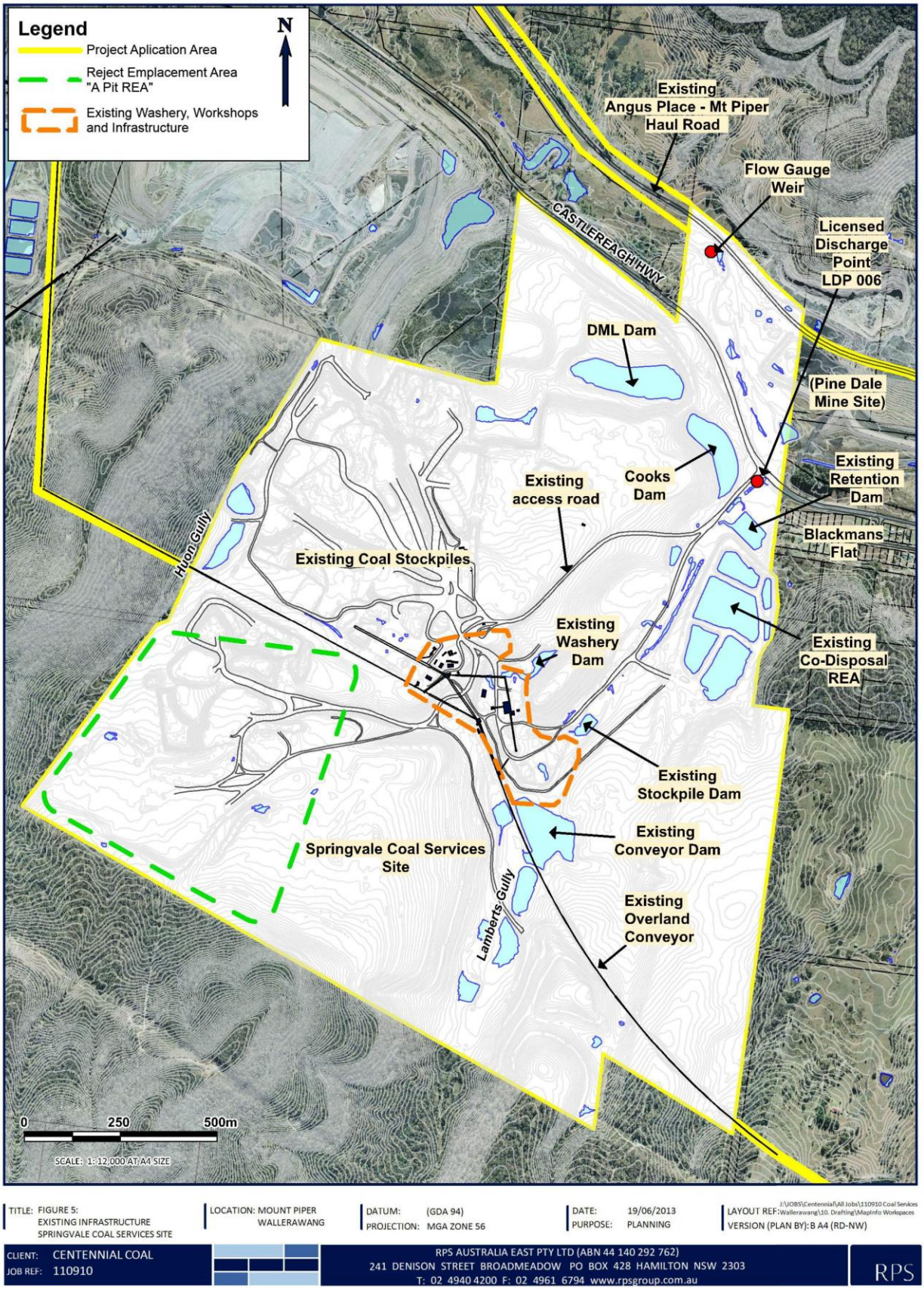
The Lamberts Gully Open Cut Mine was operational from 1994 to 2010 and extracted coal from both north and south of the OL.

Springvale Coal purchased the Springvale Coal Services Site in October 1994 from Novacoal, who, under a 1992 development consent relating to the main Springvale Coal Mine, constructed the OL, coal stockpile facilities and reject disposal facilities. The Washery was built in the early 1970s for production of export steaming coal that was trucked across the Castlereagh Highway to the Wallerawang Rail Siding (now dismantled and part of the Pine Dale Mine site). This Washery was upgraded in 1995.

Springvale Coal Mine, an underground mining operation, was approved in 1992 and developed in 1995 to supply coal to Mt Piper Power Station by OL via the old Western Main site – now referred to as the Springvale Coal Services Site. The original approval included the ability to process coal for export via the same OL to Lidsdale Siding. A subsequent modification (MOD) in 1995 to the original 1992 development consent (DA 11/92) allowed the construction of a short conveyor link to Wallerawang Power Station.

Angus Place Colliery is an underground mining operation that commenced operations in 1979. It received a contemporary Part 3A approval in 2006 to extend mining operations. Angus Place Colliery produces coal from the Lithgow seam to supply Wallerawang and Mt Piper Power Stations using two private haul roads.

Figure 5 Existing Infrastructure on Springvale Coal Services Site



3.2 Existing Approvals, Leases, Licenses and Titles

Development consents relevant to the Project are detailed in **Table 2** below.

Table 2 Development Consents and Project Approvals

Consent	Description	Expiry date	Issued by
Springvale Coal Mine			
11/92	Original development consent for the construction and operation of an underground coal mine, OL and coal Washery at Springvale.	28 September 2014	DoP (now DPI)
11/92 – MOD 1	Modification to original consent to include: ▪ Pit top layout; ▪ Stormwater control; ▪ New mine entry; ▪ Relocation of ventilation shafts; ▪ Utilisation of existing Western Main Washery; and ▪ Relocation of overland conveyor route.	28 September 2014	DoP (now DPI)
11/92 – MOD 2	Modification to original development consent by the replacement of the land description with a revised schedule of land tenements.	28 September 2014	DoP (now DPI)
11/92 – MOD 3	Modification to development consent to allow construction and operation of an additional mine dewatering facility (Bore 8) and ancillary infrastructure.	28 September 2014	DPI
326/02	Development consent for the construction and operation of a coal conveyor under the Castlereagh Highway to Wallerawang Power Station.	In perpetuity	Lithgow City Council (LCC)
461/02	Development consent for the construction and operation of a ventilation shaft facility on the Newnes Plateau in the Newnes State Forest.	In perpetuity	LCC
Angus Place Colliery			
PA 06_0021	Project approval under Part 3A of the EP&A Act for the extension of longwall mining operations at Angus Place Colliery. This included increasing the production limit to 3.5 Mtpa and allowing haulage by truck to Wallerawang and Mt Piper Power Stations.	18 August 2024	DoP (now DPI)

Consent	Description	Expiry date	Issued by
PA 06_0021 MOD 1	Modification to the Part 3A approval for: ▪ two additional longwall panels (LW910 and 900W); ▪ increase in annual coal production from 3.5 to 4.0 Mt and the total extraction to 33.6 million tonnes over the life of the mine; ▪ modifications to the pit-top dirty water management system; ▪ increase in full-time staff from 215 to 225; and ▪ increase the life of mine by two years to 2016.	18 August 2024	DPI (through the Planning Assessment Commission)
PA 06_0021 MOD 2	Modification to the Part 3A approval for Ventilation Facility Project.	18 August 2024	DPI (through the Planning Assessment Commission)
Lamberts Gully Open Cut and Springvale Coal Services			
110/98	Development consent for an open cut at Lot 501 in DP 825541, located on the Castlereagh Highway Lidsdale (referred to as Lamberts Gully Open Cut Mine).	In perpetuity	Lithgow City Council
06-0017	Project approval under Part 3A of the EP&A Act for the expansion of Lamberts Gully Open Cut Mine.	12 May 2014	DoP, (now DPI)
06-0017 MOD 1	Modification to Part 3A Project approval to extract an additional 114,000 tonnes of coal and construct an access ramp to LCC's waste disposal facility on behalf of the Council.	12 May 2014	DoP (now DPI)
Coal>Link Pty Ltd			
DA 105/92	Development consent held by Coal >Link Pty Ltd for the purpose of a private haul route from Angus Place Colliery to Mt Piper Power Station.	In perpetuity	LCC

Mining leases relevant to the Project are identified in **Figure 6** and **Table 3**.

Springvale Coal Pty Limited holds an Environmental Protection Licence (EPL 3607) that includes licenced discharge point (LDP 006) for the Springvale Coal Services Site and LDP 007 for the OL.

LDP 006 permits water to discharge from the Springvale Coal Services Site into Lamberts Gully and, ultimately, into Wangcol Creek.

Angus Place Colliery holds EPL 467 and this includes LDP 003, which permits discharges from the Kerosene Vale Coal Stockpile Area via the pollution control dam west of the Angus Place to Wallerawang Power Station Haul Road.

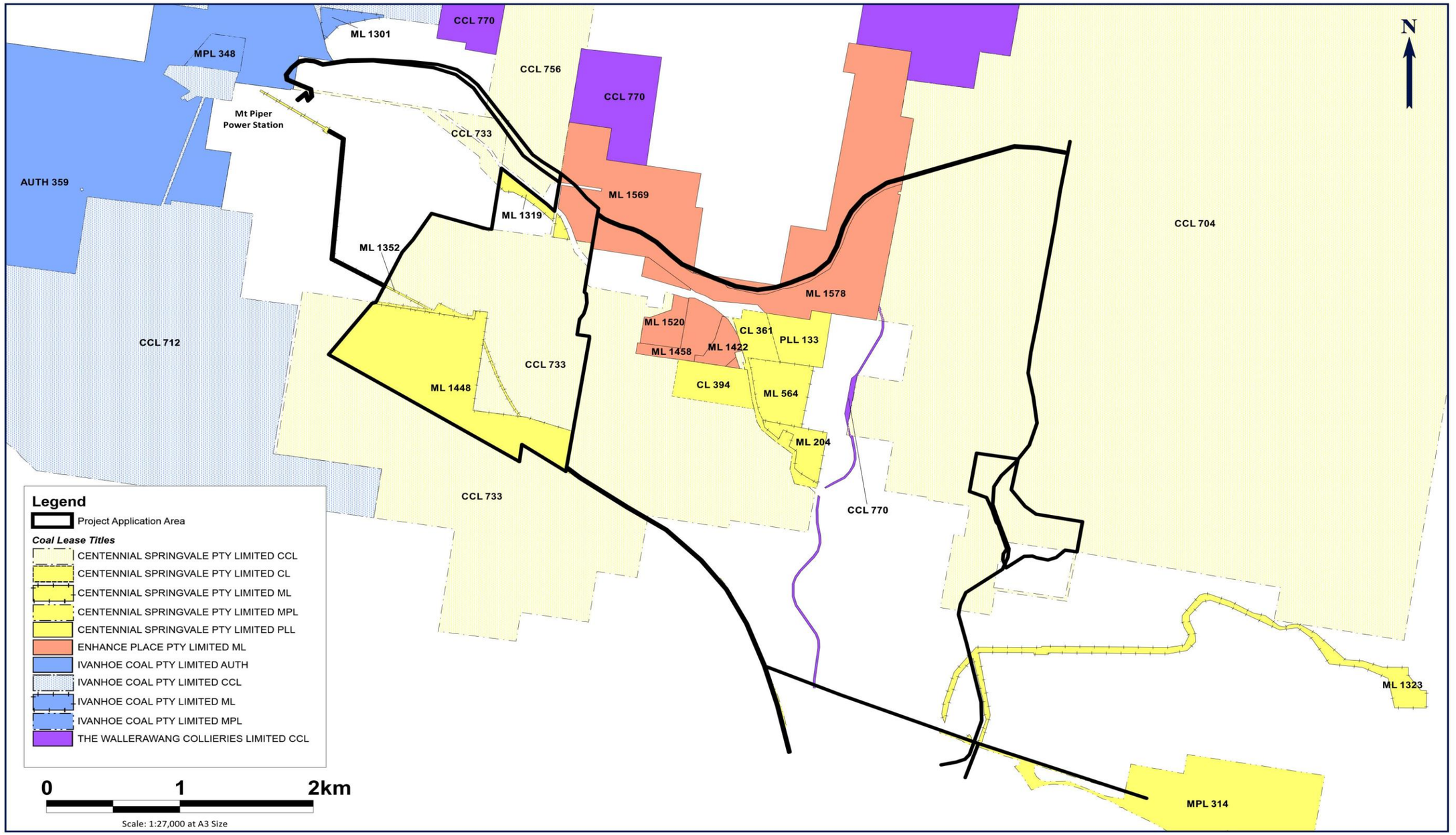
Leases, Authorisations and Licences relevant to the Project are detailed further in **Table 3.**

Table 3 Mining Leases, Authorisations and Licences

Authority	Type of Authority	Expiry date	Holder
Lamberts Gully Open Cut Mine and Springvale Coal Services			
CCL 733	Consolidated Coal Lease	3 July 2027	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
ML 1448	Mining Lease	30 May 2020	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
ML 1352	Mining Lease	22 June 2015	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
ML 1319	Mining Lease	5 July 2014	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
Springvale Coal Mine			
MPL 314	Mining Purposes Lease	2 August 2014	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
Angus Place Colliery			
CCL 704	Consolidated Coal Lease	18 August 2023	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
ML 1424	Mining Lease	18 August 2024	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
EL 6293	Exploration licence	16 September 2014	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
EL 7415	Exploration licence	20 October 2014	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd

Licences			
Reference	**Description**	**Expiry Date**	**Issued by**
EPL 467 (Angus Place)	Environment Protection Licence.	Anniversary 1 January	NSW Environmental Protection Agency
EPL 3607 (Springvale)	Environmental Protection Licence.	Anniversary 1 January	NSW Environmental Protection Agency
Bore Licences	Licences for groundwater bores licensed under Part 5 of the Water Act 1912 for mine dewatering and monitoring purposes.	Various	NSW Office of Water (NOW)

Figure 6 Coal Mining Leases Plan



3.3 Existing Operations and Infrastructure

The current approved operations that are associated with this Project are:

- Springvale Coal Mine, which extracts the Lithgow Seam by longwall mining methods and includes the transport of coal by OL to both the Mt Piper and Wallerawang Power Stations. The existing Springvale Coal Services Site is approved within the Springvale Coal Mine consents and consists of coal processing and reject and tailings disposal activities;
- Angus Place Colliery, which extracts coal from the Lithgow Seam via longwall mining methods and includes the transport of coal to Wallerawang and Mt Piper Power Stations by private haul roads and storage of coal at the Kerosene Vale Stockpile site; and
- Lamberts Gully Open Cut, which is located at the Springvale Coal Services Site. Coal production has ceased at this location and rehabilitation is underway.

3.3.1 Springvale Coal Mine

Springvale Coal Mine received a development approval in 1992 which provided for the construction of an underground longwall operation and associated infrastructure. The approval covered the construction of the OL system, and coal handling, processing, stockpiling and reject disposal at the Springvale Coal Services Site.

This Project does not involve any changes to the underground mining operation, coal production rates or mine related infrastructure, such as ventilation and boreholes. Nor does the Project modify pit top facilities, such as workshops and stores, office and amenities. This Project does, however, include all aspects of the OL system to the power stations and Lidsdale Siding and the Springvale Coal Services Site as described below.

3.3.2 Overland Conveyors

As shown in **Figure 3**, the OL links the Springvale Coal Mine pit top to the Springvale Coal Services Site, Mt Piper Power Station and Wallerawang Power Station. A single conveyor structure with a capacity of 900 tonnes per hour (tph) runs the entire route, which is approximately 10 km in length. Run of Mine (ROM) coal from the Springvale Coal Mine travels on the upper belt to the Springvale Coal Services Washery. Washed or processed coal for export travels on the return strand of the belt from the Washery to Lidsdale Siding.

Drive motors for the OL are located so as to minimise noise impacts at surrounding residences. The first drive is located in a valley running off the Castlereagh Highway near its intersection with the Angus Place Colliery to Wallerawang Power Station Haul Road. The site is visible from the highway but there are no residences nearby.

The area between the Washery and the Mt Piper Power Station is isolated from any residential areas and cannot be viewed from any publicly accessible vantage point.

The entire conveyor is equipped with three-quarter enclosed Colorbond sheeting weather covers. A demountable galvanised wire-mesh screen runs down the full length of the exposed side of the conveyor as well as down both sides and under the conveyor to prevent contact with any moving parts.

Access across the conveyor route has been provided for stock and general landholder access. A service and access road has been constructed adjacent to the conveyor for the majority of the route, except in sections where a nearby road exists.

3.3.3 Coal Handling and Processing

Coal handling of up to 3.4 Mtpa and processing of up to 2 Mtpa occur at the Springvale Coal Services Site. This site includes a Washery, raw and product coal stockpiles, coal reject disposal areas, coal handling infrastructure, offices and control room. These facilities were approved as part of the 1992 Springvale Coal Mine development consent. **Figure 5** is a plan showing existing infrastructure and activities on the Springvale Coal Services Site. Other than coal delivered to Wallerawang Power Station, the Springvale Coal Services Site currently handles all coal produced by Springvale Coal Mine. In previous years, Springvale Coal Services has also handled a maximum of 400,000 tonnes per annum from the Lamberts Gully Open Cut under separate approvals.

The Springvale Coal Services Site does not currently handle coal from Angus Place Colliery.

Over the past 10 years, approximately 100,000 tpa of reject has been blended with other coal for sale to Mount Piper Power Station and other commercial users.

There are two separate raw coal handling OL systems. The first allows raw coal to be delivered directly to Mt Piper Power Station from Springvale Coal Mine, while the second provides feed for the Washery. Coal requiring washing is delivered to a 150,000 tonne capacity stockpile within the Springvale Coal Services Site, which can then be conveyed into the Washery.

An additional stockpile capacity of up to 600,000 tonnes can be used if Mt Piper Power Station is unable to receive coal for an extended period. The stockpile area can also be used to blend reject and to store and feed raw coal produced from other operations.

3.3.4 Coal Rejects and Tailing Management

At present the Washery on the Springvale Coal Services Site is capable of processing approximately 2 Mtpa, producing over 300,000 tonnes per annum (tpa) of reject (comprised of 150,000 tpa fine and 150,000 tpa coarse reject).

There are currently two REAs located at the Springvale Coal Services Site as shown on **Figure 5.**

The main existing REA is located within the final void of the Lamberts Gully Open Cut, referred to as ‘‘A Pit REA’’. The A Pit REA is currently the main disposal area for both coarse and fine reject produced from the Washery.

Coarse reject from the Washery is trucked from the Rejects Bin to the A Pit REA, where it is used to construct cells to contain fine reject. The fine reject is pumped from the Washery as slurry (referred to as tailings) into these cells. Coarse reject is also used as a capping material once the cells are full.

A second REA is located near the main entrance to the Springvale Coal Services Site and is known as the Co-Disposal REA. This REA was the original reject disposal area for the site and was approved separately under the then Section 126 of the *Coal Mines Regulation Act,* and then later under Section 102 of the *Coal Mines Health and Safety Act*. Operation of the Co-Disposal REA will continue to be used as a backup to the existing and proposed fine reject circuit in the Washery.

3.3.5 Private Haul Roads

Private haul roads link Angus Place Colliery with Wallerawang and Mt Piper Power Stations. All coal produced at Angus Place Colliery is loaded into trucks from the Final Product Bin, after stockpiling and sizing, and transported directly to either Wallerawang or Mt Piper Power Stations. The private haul roads are shown in **Figure 3**. The Angus Place to Mount Piper Private Haul Road is owned by Coal>Link Pty Ltd, who obtained a planning consent for its construction. The Angus Place to Wallerawang Haul Road is owned by

Angus Place Colliery. Currently, planning consents for the use of both private haul roads are held by Angus Place Colliery.

3.3.6 Kerosene Vale Stockpile Area

The Kerosene Vale Stockpile Area represents the original pit top of Angus Place Colliery, known then as Newcom Colliery, which commenced operation in 1949. The pit top was relocated to its current location in 1979 and was renamed Angus Place Colliery. The Kerosene Vale Stockpile Area is an approved stockpile for up to 500,000 tonnes of coal. The area has a Licenced Discharge Point (LDP) 003 which is located opposite the site on the western side of the Angus Place to Wallerawang Haul Road.

The Kerosene Vale Stockpile Area is also the location of staging pumps for Angus Place Colliery water supply. The use of the Kerosene Vale Stockpile Area will form an ongoing component of the Project operation as it forms part of the coal transport logistics.

3.3.7 Lamberts Gully Open Cut Mine Operations

Open cut activities at Lamberts Gully Open Cut ceased in 2010. There are still some relevant activities which are proposed to be incorporated into the consent sought for this Project.

The Lamberts Gully Open Cut, although now closed, holds a separate Project Approval with conditions relevant to the ongoing operation and rehabilitation of the site. Springvale Coal Mine holds planning approval to emplace 4 million tonnes of coal Washery reject into the currently proposed emplacement area, while Lamberts Gully Open Cut provided planning approval to mine the coal beneath the approved REA and prepare the area to receive reject produced from the Washery.

3.4 Water Management

3.4.1 Springvale Coal Services Site

The Springvale Coal Services Site operates under a Surface Water Management Plan (SWMP) approved by the then Department of Planning in August 2009. The surface water management systems consist of a partial separate clean and dirty water flow paths. Dirty water is controlled by a series of dam structures with excess water being discharged through the LDP006 of EPL 3607 held by Springvale Coal Mine.

Dirty water is captured and contained within four main pollution control dams referred to as the Washery Dam, Stockpile Dam, DML Dam and Cooks Dam. Furthermore, several smaller pollution control structures exist around the Lamberts Gully Open Cut Mine area, as well as two structures located within the Lamberts Gully drainage line. These latter structures are known as the Conveyor Dam, which is divided by the OL and the Retention Dam, which is located near the site entrance. Locations of the dams are shown in **Figure 5.**

Contained water from the main pollution control structures (Washery, Stockpile, DML and Cooks Dams) is preferentially reused onsite to supply the existing Washery and for other raw water uses, such as dust suppression. The SWMP includes procedures for pumping between the various water storages in order to maximise both stormwater retention and recycling abilities.

The EPL for the Springvale Coal Services Site includes a number of additional water management improvements which have been implemented. These include establishing additional pumping capacity, further recycling initiatives, additional runoff controls around the Washery area, and further environmental investigations that may lead to additional controls in the future.

3.4.2 Overland Conveyors

The overland conveyors link the Springvale Coal Mine to Mt Piper Power Station via the Springvale Coal Services Site, Lidsdale Siding and Wallerawang Power Station. Except for the underpass beneath the Castlereagh Highway and a section parallel to Duncan Street, Wallerawang, the conveyor is above ground and no specific drainage controls are necessary. An access road runs adjacent to the conveyor for the majority of the route, with the exception of the road crossings and when running parallel to the Springvale Coal Mine entry road. The structure crosses the Coxs River flood plain but is elevated above the 1-in-100 year ARI flood level.

The transfer point between conveyors, being the intersection of the conveyor from the Springvale Coal Mine to the conveyor between the Springvale Coal Services Site and Lidsdale Siding, has a collection pit and sump. This is to contain any coal spillage from the transfer point, which can then be cleaned out using mobile plant. The collection pit represents LDP 7 (LDP 007) in the Springvale Coal Mine EPL. Similarly a conveyor spur branching from the overland conveyor at a point approximately 1 km west from the Springvale Coal Mine services the Wallerawang Power Station. The transfer point between the conveyors has a collection pit and sump.

The conveyor is three quarters enclosed to protect the belt from rainwater. There are four drive stations which are roofed to avoid any dirty runoff. There are no physical works proposed to the conveyors and the existing drainage systems are considered adequate.

3.4.3 Angus Place Colliery to Mount Piper Power Station Private Haul Road

This haul road was constructed by Coal>Link Pty Limited in 1991 for the purposes of hauling coal to the local power stations. The road is approximately 7.5 km long and intersects with the Angus Place to Wallerawang Power Station haul road, enabling access to both Mount Piper and Wallerawang Power Station. The road runs generally east-west, with the predominant natural drainage flowing from north to south.

The haul road crosses the Coxs River and Neubecks Creeks, and a section runs parallel to Wangcol Creek. Water course crossings are in-fill sections with multiple piped culverts. The road is predominantly in cut, with an earthen bund on the southern side. These sections are drained via a series of channels along the upslope side which direct water away from the road and into natural water courses. These, in turn, are piped under the road in-fill sections.

No works are proposed to this haul road and the drainage system is considered adequate.

3.4.4 Angus Place Colliery to Wallerawang Power Station Private Haul Road

This haul road was completed in 1979 for the purpose of hauling coal from Angus Place Colliery to Wallerawang Power Station. It is approximately 5.5 km long with a sealed pavement designed for heavy vehicle haulage. The road is aligned generally north-south, and prevailing drainage flows from east to west. Natural drainage is directed beneath the road into piped culverts generally in areas of fill batters. When the road is in-cut, i.e. below the natural surface, runoff is collected in channels above cut batters and directed to natural drainage paths towards the existing culverts. The pavement is drained via table drains along the road verge into culverts beneath the road.

The road passes beneath the overland conveyor from Springvale Coal Mine to the Springvale Coal Services Site as well as beneath the Castlereagh Highway. The final section of the road, as it enters Wallerawang Power Station, is drained into the existing surface water management system of the power station.

No works are proposed to this road and the drainage system is considered adequate.

3.4.5 Kerosene Vale Stockpile Area

The Kerosene Vale Stockpile Area is used to temporarily store coal when either Wallerawang or Mt Piper Power Stations are unable to accept coal. Stormwater run-off from disturbed areas of Kerosene Vale Stockpile Area drain to a separate dirty water system, which is directed through on-site settling ponds and dosing system prior to discharge through LDP 003 of Angus Place Colliery EPL. Water quality at LDP 003 is monitored during discharge via an automated sampler and flow rate is measured through a flow monitor. The sampler records live readings of water quality parameters such as Total Suspended Solids (TSS), pH and electrical conductivity (EC), as well as collecting water samples in bottles that later undergo laboratory testing.

No additional activities are proposed for the Kerosene Vale Stockpile Area.

3.5 Employment

The Springvale Coal Services Site currently employs 15 full time employees. This figure excludes contract truck drivers and service providers.

3.6 Hours of Operation

Springvale Coal Services Site operates 24 hours per day, 7 days per week. This includes all coal handling, processing, reject disposal and the OL system.

The private haul road between Angus Place Colliery and Mt Piper Power Station operates 24 hours per day, 7 days per week. However it is limited to 5 loaded trucks per hour between 21.30 and 0700, while transport between Angus Place Colliery and Wallerawang Power Station is limited to the hours of 0700 to 22:00.

3.7 Overlapping consents

Table 4 identifies the overlapping consents within the PAA. The interaction of these consents is managed through ongoing consultation with relevant consent holders and, where necessary, commercial agreements.

Table 4 Western Coal Services Project: Overlapping Development Consents

Consent and Consent Holder	Consented Use (Date of Consent)	Project Interaction
Coal>Link Pty Ltd	Haul road from Angus Place to Mt Piper Power Station (1992).	Haul road intersection linking the Mt Piper Haul Road to the Springvale Coal Services Site.
Springvale Coal Mine	Washery, reject and tailings management (1992).	Continued use of Washery, placement of reject in approved Reject Emplacement Area. The existing Springvale Mine development consent expires in October 2014. Any new consent granted for this Project will supersede the 1992 development consent.
Angus Place Colliery	Project Modification (2006).	Continued use of Mt Piper private haul road to transport 4 Mtpa by road.
Pine Dale Coal Mine	Open cut coal mine (2005).	New Link Haul Road crossing land owned by Enhance Place Pty Ltd.
Lamberts Gully	Open cut mine and Reject Emplacement Area (2006).	New Reject Emplacement Area over existing approved site, continuation of rehabilitation activities. The existing Lamberts Gully approvals will be surrendered with all remaining rehabilitation commitments included in the development consent for this Project.

Consent and Consent Holder	Consented Use (Date of Consent)	Project Interaction
Lithgow City Council	Waste management facility (2007).	New Link Haul Road crossing land owned by Lithgow City Council.
Weston Matrix	Crushing of reject material for road base (2011).	Coal stockpile located within Weston Matrix consent area.
Delta Electricity	Ash emplacement at Lamberts North and Lamberts South (February 2012) in an area equivalent to the existing and proposed Reject Emplacement Area.	Proposed expansion of existing Reject Emplacement Area on land owned by Centennial Coal within Delta consent area.

In order to undertake the Project, Springvale Coal will enter into agreements with Lithgow City Council, Coal>Link Pty Ltd, Enhance Place Pty Limited (Pine Dale Coal Mine) for access to land owned by these parties within the PAA.

Springvale Coal acknowledges that Delta Electricity obtained project approval in February 2012 that authorises the emplacement of ash over the area proposed in this Project for reject emplacement. As Springvale Coal is the landholder, Delta Electricity will be required to enter into an agreement with Springvale Coal (in much the same way Springvale Coal will be required to enter into agreements with other landholders within the PAA) for the emplacement of ash. To date, no such agreement is in place. Further, as Springvale Coal holds mining title over this area (ML1448) any works proposed by Delta in this area would also require consent from Springvale Coal as the leaseholder.

3.8 Existing Environmental Management and Monitoring

The existing approved operations and infrastructure within the PAA operates under an established EMS that has been developed in accordance with the Centennial EMS Framework.

The EMS has been developed and implemented to ensure the effective management of environmental issues and compliance with all regulatory requirements. The EMS incorporates a number of EMPs that are designed to assist in meeting community and regulatory expectations. The following management plans are relevant to the Project:

- EMS Framework document;
- Rehabilitation and Landscape Plan Coal Services;
- Water Management Plan Coal Services Site;
- Dust Management Plan Coal Services Site;
- Noise Management Plan Coal Services Site;
- Erosion and Sediment Control Plan Coal Services;
- Bushfire Management Plan;
- Hazardous Substances Management Plan;
- Slope Stability Management Plan Coal Services;
- Mechanical Engineering Management Plan;
- Electrical Engineering Management Plan;
- Lamberts Gully Surface Transport Management Plan;
- General Environmental Management;
- Stakeholder Engagement Plan;
- Contractor Environmental Management Plan;

- Wallerawang Haul Road Inspection Protocol;
- Wallerawang Haul Road Landscape Management Plan;
- Noise Management Plan (Haul Roads);
- Inspections and Maintenance Program (Coal Services);
- Order 34 Training and Competency Management System (Coal Services);
- Subsurface Drainage Management (Coal Services);
- Reject Emplacement Procedure (Coal Services);
- Cultural Heritage Plan;
- Angus Place Environmental Monitoring Plan;
- Kerosene Vale Rehabilitation Plan (draft);
- Angus Place Noise Monitoring Program;
- Angus Place Site Water Management Plan; and
- Angus Place Air Quality Monitoring Program.

These documents provide a framework for the planning of operations associated with the PAA, including operation of the transport infrastructure, while considering potential environmental issues and their management on-site. Springvale Coal Mine and Angus Place Colliery have other management plans and systems covering their respective mining operations, however these are not relevant to the coal transport and processing operations.

4.0 Project Description

4.1 Project Objective

The objective of the Project is to develop suitable infrastructure to enable flexibility to supply both domestic and export markets from nominated mines within the Western Coalfield. An overview of the Project inputs and outputs has been provided in **Figure 2** in the Introduction of this EIS.

4.2 Overview of Project

The key elements of the Project are illustrated in **Figures 7** and **8** include:

- Upgrading the existing Washery, workshops and infrastructure within the Springvale Coal Services Site by constructing a new Washery adjacent to the existing facility that will remain operational to provide a total processing capacity of up to 7 Mtpa;
- Construction of processing infrastructure including additional conveyors and transfer points and other coal handling requirements to cater for the upgraded Washery facility within the existing disturbance footprint of the Springvale Coal Services Site;
- Extending and enlarging an existing REA to enable sufficient reject disposal capacity for a 25 year life;
- Increasing the utilisation of the return side of the existing OL system to enable up to 6.3 Mtpa of coal to be delivered to Lidsdale Siding;
- Constructing a private Link Haul Road, approximately 1.3 km in length, linking the Springvale Coal Services Site with the existing private haul road from Angus Place Colliery to Mt Piper Power Station. This private road will cross a section of the existing Pine Dale Mine operation and over the Castlereagh Highway. The preferred location of the new private Link Haul Road is identified on **Figure 7**;
- Improving the current water management systems on the Springvale Coal Services Site by separating clean and dirty water streams prior to either reuse or discharge off site;
- Integrating the existing approved transport and processing of coal at Springvale Coal Mine and Angus Place Colliery into the one consent;
- Integrating the remaining rehabilitation, monitoring, water management and reporting requirements associated with the Lamberts Gully Open Cut Mine which occupies the Springvale Coal Services Site; and
- Continued use of all existing approved infrastructure, facilities and activities associated with the transport and processing of coal from each mine gate and the point of delivery to the Springvale Coal Services Site. This infrastructure includes the existing conveyors, private haul roads, Kerosene Vale Stockpile Area, REAs, services, access roads, car parks and buildings.

The Project will enable a total of 7 Mtpa of coal to be processed on site, yielding up to 6 Mtpa of product coal available for export. The delivery capacity of the OL system to Lidsdale Siding is 6.3 Mtpa, which can be used for both processed and unprocessed coal. The factors that have been considered in reaching this future production level include:

- The physical limitations of the existing OL system to Lidsdale Siding;
- A planned increase of coal production at Springvale Coal Mine up to 4.5 Mtpa;
- An approved production at Angus Place Colliery of up to 4.0 Mtpa;
- The ability to export coal from Angus Place Colliery to overseas markets; and
- The ability to export coal from other local resources.

4.3 Physical Project Components

4.3.1 Coal Handling and Processing

The existing Washery would be retained as part of the Project and would continue to operate at its nominal capacity of 2.0 Mtpa of ROM sized coal per annum.

A new Washery is proposed adjacent to the existing Washery in order to maintain the ability to process coal for export during the upgrade. This will enable an additional 5.0 Mtpa of ROM coal per annum to be processed and will include waste recovery and water recycling circuits which enable both a dry coarse and fine reject.

The new Washery may be required to process coal from other mines in the region. The Washery design will therefore be flexible to cater for various coal qualities, as well as any product specification that may change over time. At this stage the design will likely consist of two separate modules:

- Fine Coal Module (FCM), where de-sliming and classifying is undertaken, and includes equipment such as the classify cyclones and spirals; and
- Dense Medium Module (DMM), to beneficiate the larger particles of the feedstock, and includes items such as the dense medium cyclone.

Two main floor levels above ground level are proposed. Sumps and pumps will be located at ground level, while screens and fine coal processing equipment will be located on the first level. All process cyclones (dense medium, classifying and dewatering) will be mounted on the second level along with other miscellaneous equipment.

The plant and its associated thickener will be on a level concrete pad. The pad will be surrounded by a sloped, concrete floor slab to allow drainage to a number of collection sumps. The sumps are provided to contain and manage spillages. Stairs, cross-bridges and walkways allow full maintenance access to each module and to the plant's control room.

This design allows for both modules to be constructed either concurrently or consecutively, and provides minimal disruption to the existing coal handling processes during the construction phase.

There will also be a number of minor upgrades or modifications to existing coal handling infrastructure in order to cater for the new Washery facility. These are shown on **Figure 8** and include additional conveyors and transfer points, reject bin, product coal stacker and reclaim system, new belt press filter building, upgraded electrical and communication systems, internal road modifications and new control room.

The Project will also include the ability to receive up to 1 Mtpa of ROM coal from adjacent operations using the existing Mount Piper Haul Road and the proposed Link Haul Road linking the Mount Piper Haul Road to the Springvale Coal Services Site.

Figure 7 Proposed Infrastructure to Springvale Coal Services Site

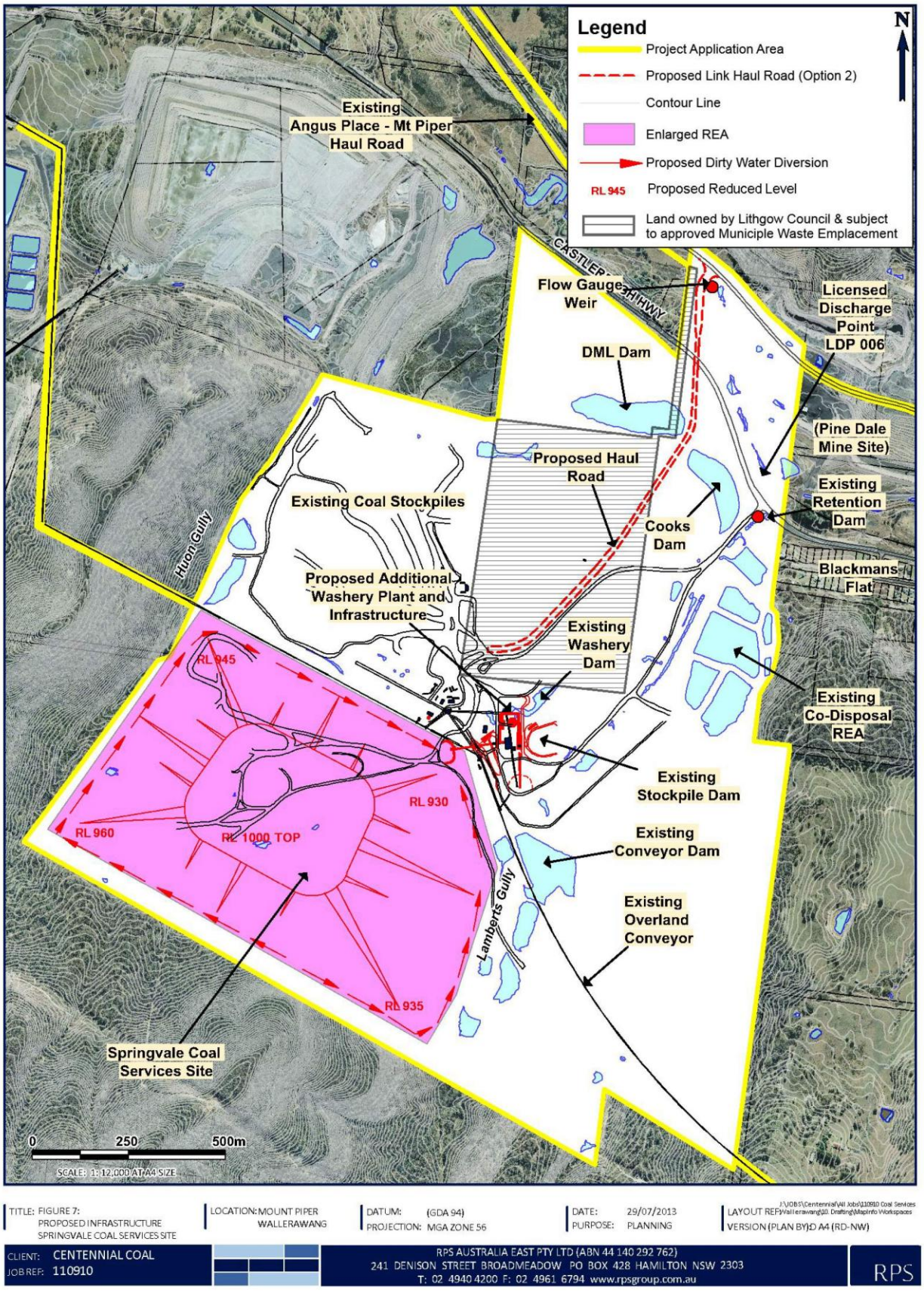
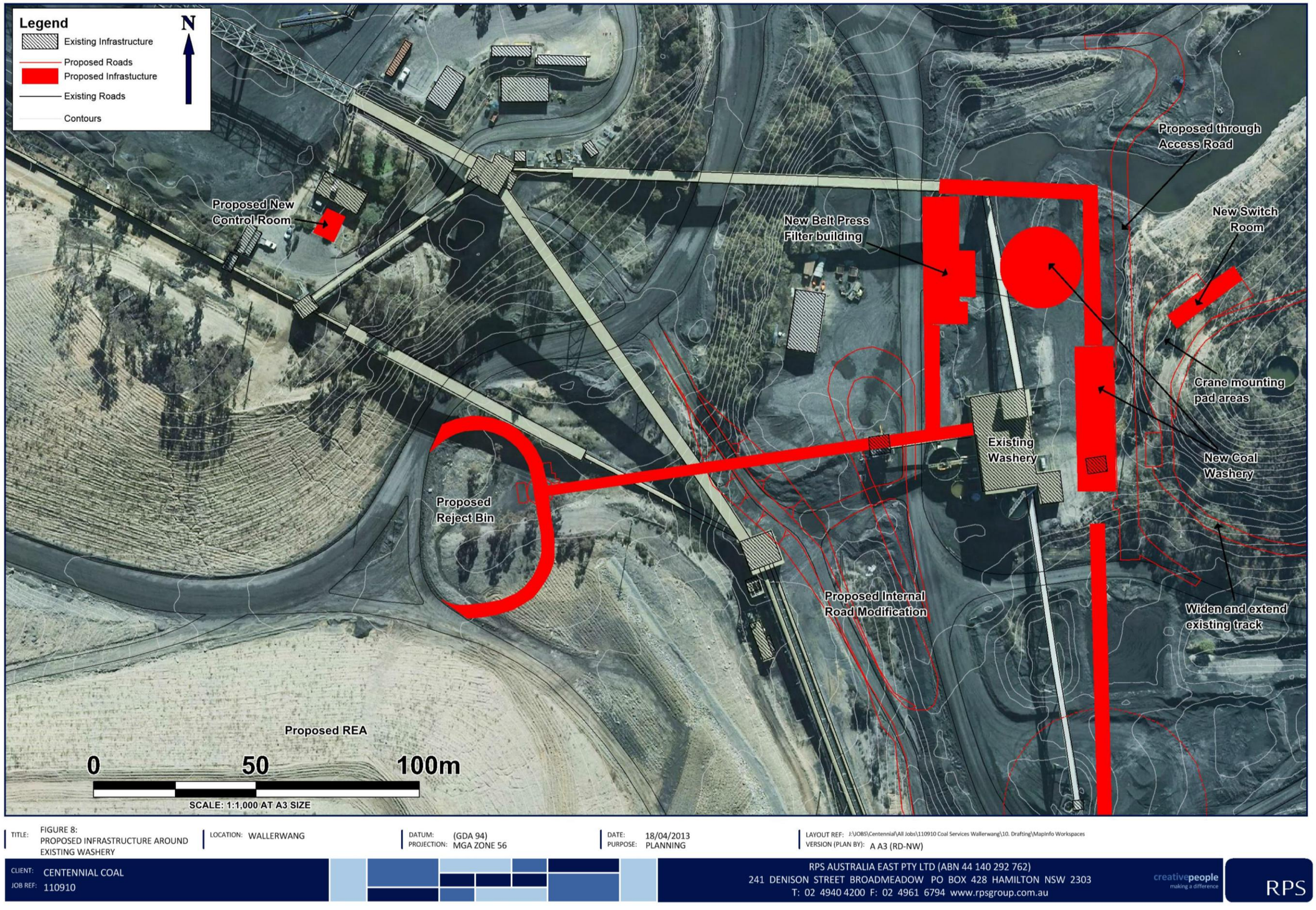


Figure 8 Proposed Infrastructure Upgrades Around Existing Washery



The assessment of impacts of the proposed infrastructure upgrade has included a total processing capacity of up to 7 Mtpa of processed coal.

4.3.2 Extension of Existing and Additional Reject Emplacement Areas

The Project will have a life of 25 years. It is anticipated that reject production will represent up to 15% of throughput, with an equal split between coarse and fine reject. With the upgraded Washery, tailings will be dewatered and combined with the coarse reject and conveyed to the rejects bin. From there, rejects will be trucked to designated emplacement sites.

Total reject production is expected to be up to 25 million tonnes.

One large new REA is proposed to the south of the existing conveyor as shown on **Figure 7**. The REA will rise from RL 930 at its lowest point in the north-east corner, to RL 1000. It will be approximately 1000 m long and approximately 700 m wide surrounded by a purpose built dirty water management system. The REA will be progressively rehabilitated as it is constructed.

The new REA will represent an enlargement of the existing approved REA. The operation of the existing REA will continue in accordance with its approval prior to any consent for its enlargement. The proposed enlarged REA will have a final design to meet industry standards as described in Section 5 of the EIS. All reject material will be moist when emplaced and compacted.

The total volume of reject able to be stored in the proposed emplacements is approximately 12.5 million m^3. Industry engineering standards suggest that a conservative density of 2 tonnes/m^3 should be used. Based upon this standard, the available storage capacity meets the required reject production over the 25-year life of the facility.

The existing Co-Disposal REA will continue to be used as a backup to the fine reject circuit however only the two southern ponds will be designated for this purpose. The remaining ponds will be rehabilitated as described in Section 5 of the EIS.

The Project also includes the ability to transport reject off site at a rate of 1 Mtpa using the private haul road network. The reject maybe emplaced at the future open cut project referred to as Neubeck Open Cut subject to obtaining the necessary approvals.

4.3.3 Existing Overland Conveyor

There are no changes proposed to the physical dimension and location of the Springvale OL.

4.3.4 New Private Link Haul Road Arrangements

In addition to the existing private haul roads, a new private Link Haul Road linking the Springvale Coal Services Site with the current Angus Place to Mt Piper Private Haul Road is proposed (Link Haul Road) and is shown in **Figure 7**. Two options for the proposed Link Haul Road have been identified and assessed, although Option 2 (the western most option) is the preferred route. Further discussion on the options explored for the Link Haul Road can be found in Section 8.

The construction of the Link Haul Road will allow a direct transfer of coal from Angus Place Colliery to the Springvale Coal Services Site for the processing of coal for export, and the blending of coal for the domestic market. The location of the preferred route for the new Link Haul Road is shown in **Figures 3** and **7**.

It is proposed that the consents relating to the use of the existing Angus Place to Mount Piper Private Haul Road and the Angus Place to Wallerawang Private Haul Road will be incorporated into the Project rather than the Angus Place Colliery consents, as is currently the case.

The proposed Link Haul Road crosses the Pine Dale Mine operation on the north side of the Castlereagh Highway, but is not likely to interfere with the current or proposed future operation of Pine Dale Mine. The land is owned by Enhance Place Pty Limited and use of this land for the proposed Link Haul Road is included in stakeholder consultation.

The Link Haul Road will also enable access to the Springvale Coal Services Site from other potential operations such as Neubecks Coal Project utilising the existing private haul road network to its approved capacities.

4.3.5 Water Management

The upgraded Washery will utilise the same water supply system as the current Washery. This water is sourced from various dams on site. There is also the provision for a water supply pipeline from the Springvale Coal Mine to the Springvale Coal Services Site running along the OL structure approved under consent 11/92 for the Springvale Coal Mine. This pipeline was approved at a diameter of 100 mm but will be installed under this approval at a diameter of 150 mm. The pipeline will also be extended to the Lidsdale Siding on the same conveyor. The proposed infrastructure upgrades and the new REA lie within the existing pollution control system for the Springvale Coal Services Site. The new REA will require the construction of a perimeter drain leading to a new 15 ML pollution control dam. This dam will be linked to the existing Washery pond and recycled water system.

The existing domestic waste water system at the Springvale Coal Services Site consists of two separate aerated waste water treatment systems. The main unit is associated with the bathhouse and ablutions building located adjacent to the existing office. This unit was designed to cater for the previous Lamberts Gully Open Cut as well as Springvale Coal Services personnel. It has a capacity in excess of 40 EP. The second unit is located near the existing Washery Control Room. Both units have spray irrigators and utilise adjacent landscaping areas. The capacity of the existing waste water treatment is more than adequate to cater for the proposed increase in workforce from 15 to 18 personnel and do not require upgrading as part of the project.

The Springvale Coal Services Site is currently upgrading its water management system. LPD 006, as identified on **Figure 5**, is at the base of the Retention Dam and takes water from Cooks Dam, Retention Dam, and the Lamberts Gully catchment. The Project proposes to separate clean water into the Lamberts Gully drainage line from the upstream catchment. The Project also proposes to separate the dirty water into the Cooks Dam catchment. LDP 006 will become a water monitoring point to monitor clean water and assess the effectiveness of the clean water diversion strategy. LDP 006 will be relocated to be a LDP for the dirty water catchment reporting ultimately to Cooks Dam.

The current approved water management programs for the existing haul roads and the Kerosene Vale Coal Stockpile site will continue unchanged.

There are no changes proposed to the water management structures and systems at the Kerosene Vale Stockpile Site, the Wallerawang Haul Road, the Mount Piper Haul Road and the OLs.

4.4 Operation

4.4.1 Operating Hours

Operating hours for the Project will continue to be 24 hours per day, 7 days per week.

4.4.2 Employment

The Project will create an additional 3 permanent employees. The 18 full time employees will work over three shifts per day.

4.5 Construction

4.5.1 Construction Activities and Scheduling

The construction is anticipated to be undertaken in three separate phases being:

- Materials handling section including conveyors, bins, skyline tripper, reclaim tunnel together with associated civil, drainage and electrical installation;
- New Washery installation; and
- Earthworks covering both the Springvale Coal Services Site and the new Link Haul Road.

The construction phase will extend over an 18-month period with the majority of the works being completed within 12-months, the remaining 6-month period being the final fit-out, and wet and dry commissioning.

4.5.2 Construction Hours

The majority of construction workers will arrive by 6am and depart around 4pm each day, however as the Springvale Coal Services Site operates 24 hours per day, 7 days per week, and needs to continue to do so during the construction period, some construction activities will need to occur outside normal construction hours.

This will include any works which involve interactions with the current operation of the Washery, conveyors, stockpiles or the Mt Piper Haul Road or the Castlereagh Highway.

4.5.3 Plant and Equipment

Anticipated equipment to be used during the construction program will include:

- Bulk earthmoving equipment (dozer, front end loader, excavators, grader and trucks);
- Cranes of various sizes;
- Concrete equipment (vessels, mixes, delivery pumps, agitators); and
- Compactor.

Not all equipment will be used at one time. The Noise and Vibration Impact Assessment contained in **Appendix 2** has modelled a worst case scenario covering anticipated construction equipment. The assessment has also included the potential for blasting which may occur when excavating some foundations.

A separate construction compound will be erected that would include minor servicing of equipment and machinery on site.

4.5.4 Employment

The construction program will involve an average of 50 workers with a peak of up to 120 workers during the 18-month construction program.

4.6 Likely Interactions between Existing and Approved Mining Operations and the Proposed Project

The Project forms part of a strategy for coal logistics for Centennial's Western Operations. The Springvale Coal Services Site will manage all coal logistics from the two primary source mines (Springvale Coal Mine and Angus Place Colliery) and market destinations including coal exported through Lidsdale Siding. The upgrade of the Lidsdale Siding is the subject of a separate Project Application. See Section 4.8 below for a more detailed analysis of the proposed interactions.

4.7 Summary of Proposed Changes to Existing Approval Conditions

Key features of the existing approved operations, and how these would be changed by the Project, are summarised in **Table 5** below:

Table 5 Summary of Changes to the Project

Key feature	Current approval	Proposed change
Production	2 Mtpa Washery throughput 600,000tpa to Lidsdale Siding.	Total capacity received 9.5 Mtpa. Total Washery throughput 7.0 Mtpa. Total conveyed to Lidsdale Siding 6.3 Mtpa. Ability to receive coal from Centennial projects via the private haul roads.
Washery	Location of plant, conveyors and stockpiles as built.	New Washery located adjacent to existing plant, additional coal feeders and conveyors within existing disturbance footprint.
Overland Conveyor	Operate at 900 tonnes per hour.	No change.
Reject Emplacement Areas	Two approved REAs. Lamberts Gully Open Cut approval allowed for the creation of a void for reject emplacement.	Additional reject emplacement capacity required to cater for future 25 year life. The Project also includes the ability to transport reject off site at a rate of 1 Mtpa using the private haul road network. The reject maybe emplaced at the future open cut project referred to as Neubeck Open Cut subject to obtaining the necessary approvals.
Hours of Operation	24 hours per day, 7 days per week.	No change.
Workforce	15 full time employees.	18 full time employees.
Rehabilitation	Rehabilitation activities included in Lamberts Gully Open Cut Mine Project.	Revised rehabilitation initiatives required as new REA will encroach on existing rehabilitation areas and approved additional revegetation provisions of the Lamberts Gully Open Cut Consent.
Pollution control	Existing licenced discharge point LDP006 at the entrance to the Springvale Coal Services Site. Existing licenced discharge point LDP003 at Kerosene Vale. Existing licenced discharge point LDP007 at Duncan Street along the OL. Existing pollution control dams (Washery,	New EPL to be sought to cover the Springvale Coal Services operation. This EPL will include the relocated licenced discharge point at Cooks Dam, the existing licenced discharge points at Kerosene Vale and along the OL at Duncan Street. Additional water quality monitoring points will be included upstream on Lamberts Gully and upstream and downstream along Wangcol Creek.

Key feature	Current approval	Proposed change
	Stockpile, DML and Cooks Dam).	Improved separation of clean water through the site along Lamberts Gully. Construction of additional sediment control ponds within the Springvale Coal Services Site to capture dirty water from disturbed areas.
Coal transport	Overland Conveyor between Springvale Coal Mine and Mt Piper Power Station and Wallerawang Power Stations. Private Haul Road between Angus Place Colliery and Wallerawang Power Station. Private Haul Road between Angus Place Colliery and Mount Piper Power Station. 50,000 tonnes of public road haulage.	A new private Link Haul Road from the Mt Piper Haul Road to the Springvale Coal Services Site.

4.8 How the Project's Proposed Development Consent would Interact with the Existing Planning Approvals for Angus Place Colliery, Springvale Coal Mine and Lamberts Gully Open Cut

The Project includes land and infrastructure which are currently regulated by the planning approvals for the Angus Place Colliery, Springvale Coal Mine and Lamberts Gully Open Cut. The Project will procure a development consent that regulates the construction and maintenance of all transport and processing infrastructure which is part of the Project. The granting of development consent for the Project will have implications for the existing planning approvals for Angus Place Colliery, Springvale Coal Mine and Lamberts Gully Open Cut. This section explains how the Project's implications for existing approvals could be managed.

4.8.1 Harmonising the Existing Part 3A Approval for Angus Place Colliery

In order that the existing Part 3A Approval for the Angus Place Colliery is ultimately compatible with the proposed development consent for the Project, it is Angus Place Colliery's intention, in due course, to lodge a new application for the life of the mine extension Project, which will align the approvals.

The granting of development consent for the Project 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 the Colliery to the Washery at the Springvale Coal Services Site via the Project's proposed private Link Haul Road. The conditions which regulate the construction and maintenance of this new private Link Haul Road would be contained in the development consent for the Project, but the conditions regulating to the use of the private Link Haul Road should be contained in the Part 3A Approval for the Colliery. For example, it would be expected that the Minister would want to modify conditions 19 and 21 of the Colliery's Part 3A Approval to make reference to the new private Link Haul Road. These conditions relevantly state:

  "19. The Proponent shall not use the Wallerawang Power Station Haul Road at night" and

  "21. The Proponent shall:

  (b) investigate ways to reduce the noise generated by the project, including noise from use of the Wallerawang Power Station Haul Road; and

  (c) report on these investigations and the implementation and effectiveness of these measures in the Annual Environmental Management Report (AEMR) to the satisfaction of the Director-General."

The deletion of conditions which impose responsibility for the maintenance and landscaping of the existing private haul road from the Angus Place Colliery to Wallerawang Power Station. These conditions, which are conditions 26 and 29 in Schedule 3 of the Part 3A Approval, will be redundant because the maintenance and landscaping of the road would be regulated by the new development consent for the Project.

4.8.2 Harmonising the Existing Development Consent for Springvale Coal Mine with the Project's Proposed Development Consent

The granting of the development consent for the Project would have the following consequences for the existing approvals for the Springvale Coal Mine:

- The regulation of the Washery and the overland conveyors from the Springvale Coal Mine to the Mt Piper Power Station and to the Lidsdale Siding by the modified Ministerial Development Consent (S91/06569/001) would be redundant. This is because those items of infrastructure, in an upgraded form, would be regulated by the Project's proposed development consent; and
- The Development Consent (326/02) granted by LCC for the construction and use of the overland conveyor to the Wallerawang Power Station would be redundant. This is because the overland conveyor will be regulated by the Project's development consent.

Springvale Coal Mine is currently seeking development consent for its life of mine operation. If Springvale Coal Mine proceeds in this manner it will facilitate the Minister granting a new development consent for the Springvale Coal Mine which is compatible with the Projects proposed development consent. Consequently it would be anticipated that the new development consent for the Springvale Coal Mine would contain a condition which requires the surrender of the modified Ministerial Development Consent and the LCC Development Consent (326/02).

4.8.3 Proposed Surrender of the Development Consent for the Lamberts Gully Open Cut Mine

The Lamberts Gully Open Cut is within the PAA. It is the intention that the proposed development consent for the Project will regulate among other things:

- The continued rehabilitation of the Lamberts Gully Open Cut;
- Monitoring of those rehabilitation works after the establishment of vegetation; and
- The REAs are shown in **Figures 5** and **7.**

It is anticipated that the proposed development consent for the Project will contain a condition which requires the surrender of the three existing development consents which relate to the Lamberts Gully Open Cut.

5.0 Rehabilitation and Mine Closure

5.1 Introduction

This section provides details of the proposed rehabilitation plan for the Western Coal Services PAA, specifically, the Springvale Coal Services Site, existing overland conveyors, existing and proposed private haul roads, and the Kerosene Vale Coal Stockpile Area. Further, the rehabilitation plan includes additional rehabilitation commitments to the now closed old Lamberts Gully Open Cut Mine at the Springvale Coal Services Site. The plan covers progressive work required during the life of the project, as well as a Final Landform Strategy.

The statutory requirements for rehabilitation work in relation to surface disturbance within coal leases in NSW are principally governed by environmental provisions of the *Mining Act 1992,* which is administered by the NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS). Springvale Coal currently holds a security deposit for the decommissioning and rehabilitation of the Springvale Coal Services Site. Angus Place Colliery holds a security deposit for the rehabilitation of the Kerosene Vale Coal Stockpile Area. These securities are held with DTIRIS.

The general rehabilitation requirements for the PAA are listed below:

- Provision of pollution control systems to protect water ways and surrounding ecosystems;
- Progressive rehabilitation of disturbed areas to a safe and stable landform compatible with the surrounding land uses;
- Provision of suitable waste management systems;
- Control of soil erosion;
- Control of noxious weeds and vermin;
- The lodgement of security deposits to ensure compliance with conditions and a regular review of these amounts in line with environment liability; and
- Upon the decommissioning of the site, removal of plant and infrastructure, and making the site safe.

In terms of overall rehabilitation requirements, DTIRIS require the site to be effectively managed until final landform is created and vegetation cover is self-sustaining. The final landform must provide long-term stability with no future liability from coal processing and reject disposal activities.

5.2 Objectives of the Rehabilitation Strategy

Planning for mine closure includes integrating the closure objectives for the Project, identifying the timing of the closure execution process, considering issues that relate to specific rehabilitation methods, consideration of community expectations, as well as making sure adequate financial provision has been made to execute the rehabilitation and closure commitments.

The purpose of the Rehabilitation Strategy is to ascertain the most appropriate option for closure in terms of performance and cost. The Strategy involves:

- Establishment of an overall vision for closure. This includes general objectives for the rehabilitation and ultimate closure of the site;
- Identification of options to achieve this overall vision, and the subsequent evaluation of identified options to assess their viability;
- Definition of objectives and targets to achieve the preferred options; and

- Description of the communication and consultation process for the preferred options.

The principal objectives of the Rehabilitation Strategy for the Project include:

- Providing an overall framework for mine closure – including rehabilitation and decommissioning strategies;
- Reducing or eliminating adverse environmental effects once the site ceases operation;
- Ensuring closure is completed in accordance with leading industry practice;
- Ensuring that the site, and any nominated infrastructure, can be put to a suitable beneficial use post-closure;
- Ensuring that the needs of employees and the local community are appropriately considered and addressed in the closure planning process, with an emphasis on generating minimal negative impacts;
- Where practical, ensuring that consideration is given to the biodiversity value of the surrounding area and the integration of these values with the final land use options for the Western Coal Services PAA;
- Establishment of clear and agreed criteria that can be used to provide the standard against which the final rehabilitation and post-mining land use can be assessed; and
- Ensuring the closed facility does not pose an unacceptable risk to public health and safety.

The principle rehabilitation objectives for the Western Coal Services Project include:

- Achieving an acceptable post-disturbance land use which takes into account both approved and potential industrial activities, municipal waste disposal, power station ash disposal, and environmental objectives;
- Creating a stable post-disturbance area for long-term beneficial uses, as well as for native vegetation propagation. Ensuring surface water dams identified to be retained will be safe, self-sustaining and acceptable for the post-mining land uses; and
- Preserving downstream water quality – the quality of surface and ground waters that leave the mining leases will be adequate to maintain, or improve, environmental values and beneficial uses downstream of the PAA.

5.3 Existing Rehabilitation and Monitoring Activities

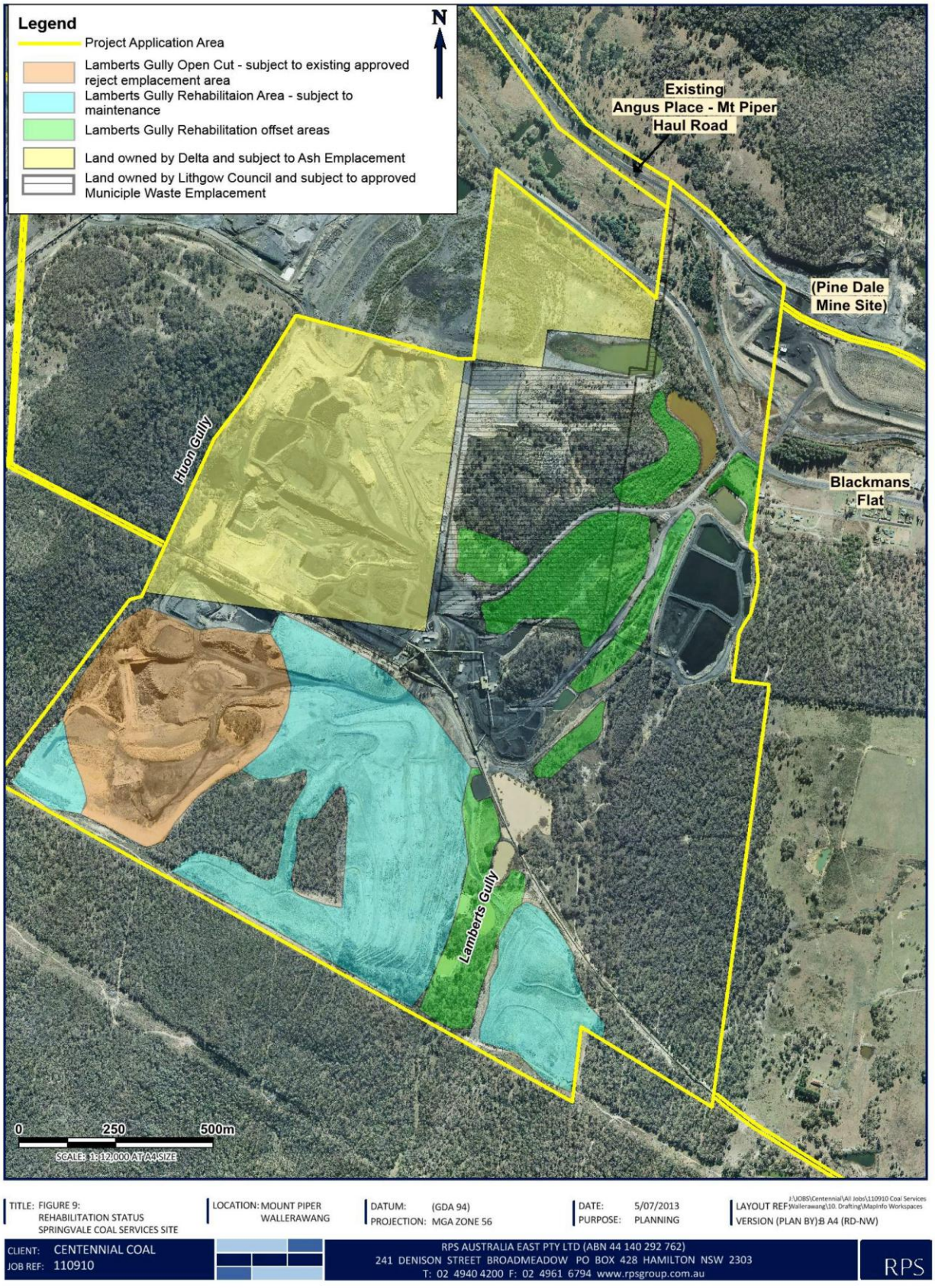
Within the PAA, Springvale Coal has a number of existing rehabilitation commitments and ongoing rehabilitation monitoring activities. These are discussed in the following sections.

5.3.1 Continuation of Rehabilitation and Monitoring for Lamberts Gully Open Cut Mine

The Lamberts Gully Open Cut Mine extracted shallow coal that was largely subject to previous underground extraction. It extended from the southern side of the current Washery and processing area at the Springvale Coal Services Site around to the northern side of the overland conveyor – towards the existing ash emplacement.

The extent of the Lamberts Gully Open Cut, and the status of the current rehabilitation work, is shown on **Figure 9**. The Lamberts Gully Open Cut was the last phase of extraction following the cessation of the previous underground mine operations, which were referred to as Western Main Colliery. As shown on **Figure 9**, the area to the north of the overland conveyor will be used by Delta Electricity for ash emplacement.

Figure 9 Rehabilitation Status Springvale Coal Services Site



The Lamberts Gully Open Cut Mine involved several phases of open cut extraction, which are now sites of ash emplacement and an approved waste disposal facility. There are some areas of historic disturbance that have not been rehabilitated. The Lamberts Gully Environmental Assessment (2006) identified these areas and proposed to rehabilitate them as part of the Lamberts Gully Open Cut Mine Expansion Part 3A Project. These areas are also identified on **Figure 9**. The commitments made in the Lamberts Gully Environmental Assessment (2006) and the subsequent Rehabilitation Plans are provided in **Table 6**.

Table 6 Lamberts Gully Environmental Assessment and the subsequent Rehabilitation Plans

Commitment	Reference	Status/Achieved	Future Commitments
Vegetation clearing to be minimised as much as practicable.	2006 EA	Achieved and completed. Vegetation was windrowed above each extraction area and then spread across completed sections.	N/A
Fill completed mining blocks with overburden as soon as practical following completion.	2006 EA	Achieved and completed. Only one mining strip was extracted at any one time.	N/A
Strip available topsoil in advance of mining.	2006 EA	Achieved and completed. A total of 62,251 m^3 of topsoil was stripped and respread.	N/A
Contour and plant final surfaces as soon as possible, consistent with constraints imposed by the operation.	2006 EA	Achieved and completed. Areas identified for final rehabilitation were contoured and planted within 12 months of the completion of mining. This excludes areas identified for future ash disposal on land owned by Delta Electricity, waste disposal on land owned by LCC, and an area set aside for reject emplacement (identified in the 1992 Springvale Mine EIS).	N/A
Native tree seed is to be used within the mining area and nominated reforestation sites at a rate of approximately 7 kg/ha. Species to be used include *Eucalyptus mannifera, E. dives E. macrorhynca, E. pauciflora, E. rubida, Acacia buxifolia, A. dealbata, A. decurrens, A. rubida*.	2006 EA	Achieved and completed. Seed mix varied with a total of 12 kg/ha of native seed used and a further 10 kg/ha of sterile cover crop. Sowing was done by helicopter. The listed species were used in the mix, as well as other native grasses and shrubs.	N/A
Tree seed collected from Capertee Stringybark will also be used in reforestation.	2006 EA	Achieved and completed. Approximately 500grams of Capertee Stringybark seed was collected from specimens on-site and used in aerial sowing.	N/A
Rehabilitation of the old mining contractors area located to the north-west of the main coal stockpile.	2006 EA	This area has been completed but requires ongoing maintenance.	Ongoing monitoring and maintenance.
Rehabilitation of the area north of the Washery water tanks and adjacent to the main access road.	2006 EA	This area has been shaped, top-dressed and sown with native vegetation. The area is considered complete.	N/A
Revegetation in the form of tree planting above the Lamberts Gully Dam between the dam and the Ben Bullen State Forest boundary.	2006 EA	This work has commenced but is yet to be completed.	Rehabilitation to be completed in Year 5 ie 2018.

Commitment	Reference	Status/Achieved	Future Commitments
Additional sowing of native tree and shrub species on the eastern side of the current tailings dams and pollution control dams to assist in shielding the operation from residents in Blackmans Flat.	2006 EA	This work has commenced and is developing.	Rehabilitation to be completed in Year 5 ie 2018.
Additional sowing of native tree and shrub species between the main pollution control ponds and the Castlereagh Highway to further assist with screening the entrance of the mine site.	2006 EA	This work has commenced and is developing.	Rehabilitation to be completed in Year 5 ie 2018.
Construct a geomorphologically stable landform that is compatible with the changed mine environment and the surrounding landforms.	2007 Rehabilitation Plan	Achieved and completed. Rehabilitation profile generally at, or less than, 1:3 (V:H) – which is both stable and similar to surrounding natural topography.	N/A
Create a drainage system within the mined areas to convey run-on from the upper catchments, and run-off from disturbed areas, across the mined area and into the existing drainage system. Erosion rates are to be comparable to the surrounding landforms, acknowledging the changed substrate.	2007 Rehabilitation Plan	Achieved and completed. Contour banks provided at regular intervals across the rehabilitated profile.	N/A
Establish the structural elements of the prior vegetation community to allow the development of an ecosystem that is compatible with the surrounding vegetation and is suitable for the physical environment of the reshaped mine area.	2007 Rehabilitation Plan	Achieved but ongoing. Rehabilitation monitoring program established, which includes a reference woodland site and three rehabilitation survey sites.	Ongoing monitoring and maintenance.
Enhance the return of faunal elements to the post-mining ecosystem by providing suitable microhabitat that is available from local materials from clearing and other sources.	2007 Rehabilitation Plan	Achieved but ongoing. Windrowed vegetation was used to spread over the completed rehabilitation areas.	N/A
Isolate any potentially acid forming material to prevent acid-generation and release into drainage and groundwater systems at a rate that cannot be neutralised by natural buffering within the immediate landform.	2007 Rehabilitation Plan	Achieved and completed. Recommendations followed to ensure that all carbonaceous material which may result in potential acid formation was buried within the completed mining strips.	N/A
Surface ripping required prior to spreading topdressing.	2007 Rehabilitation Plan	Achieved and completed.	N/A
The northern section of the open cut in the E Block will be shaped to allow access to the Council waste emplacement.	2010 Closure Plan	Achieved and completed.	N/A

Commitment	Reference	Status/Achieved	Future Commitments
The remainder of the E Block will be left in a stable condition but totally un-rehabilitated. Access roads will be left or modified to assist Delta in the transport of ash from the power station.	2010 Closure Plan	Achieved and completed.	N/A
F and C Blocks to be shaped with suitable slopes and channel profiles that merge into the natural landform contours present along the boundary of the mining area.	2010 Closure Plan	Achieved and completed.	N/A
Block A and its extension, referred to as Block D, will form the final void to be filled with reject. Block B will form the future base of the currently approved REA.	2010 Closure Plan	Achieved and completed with reject currently being emplaced in the A Pit void. The prepared base of the currently approved REA has been prepared but not utilised as of yet.	N/A
The current open cut void (A Pit) and area beneath the proposed REA will remain un-rehabilitated until such time as the proposed REA has been completed. This will be in approximately 10 years.	2010 Closure Plan	A Pit is still being used to emplace reject. Area nominated in 1992 Springvale EIS for reject emplacement has been bunded with overburden for use as future cover material.	Subject to ongoing rehabilitation commitments as detailed in Section 10.
Monitor rehabilitation work. The areas to be monitored include the existing open cut rehabilitation works to the south of the overland conveyor; existing and proposed future rehabilitation and re-vegetation works associated with the habitat compensation areas; and a minor additional amount of rehabilitation required around the future REA – but not within the footprint of the final REA.	2010 Closure Plan	Monitoring program has been established and the results reported in each AEMR.	Ongoing

The E Blocks are all located on the northern side of the overland conveyor and, as described above, have been prepared in accordance with both Delta Electricity and LCC requirements. On the southern side of the overland conveyor (Blocks A, B, C, D and F), the open cut has been backfilled and shaped, with the final void being used for reject emplacement. This area is now proposed for the REA as part of this Project. There are other smaller sections of the original Lamberts Gully open cut which will continue to be rehabilitated as part of the ongoing operation. These areas are shown on **Figure 9**. As part of the Project, Springvale Coal will continue to rehabilitate and monitor the previous Lamberts Gully Open Cut Mine in areas not subject to the proposed new REA. This consists of the:

- Continuation of rehabilitation activities within the approved Rehabilitation and Landscape Management Plan, and the Additional Rehabilitation Initiatives – with the exception of the land proposed for future reject emplacement; and
- Monitoring of previous rehabilitation works that will not be impacted by the proposed REA, and of all new areas of rehabilitation arising from the Project. Such monitoring will continue for a period of up to 10 years following the establishment of vegetation, or until such time as the rehabilitation work has been approved by DRE as detailed in **Table 6.**

The additional rehabilitation areas nominated in the Lamberts Gully Open Cut EA and subsequent approval are shown on **Figure 9.** Of the 25 ha nominated, approximately 18 ha has been rehabilitated. These areas include the slopes above Cooks Dam, the area adjacent to the Site's main access road, an area to the north of the ROM stockpile (referred to as the Open Cut Contractors Area), and sections of the drainage line to the west of the Co-Disposal REA. The remaining area is the narrow valley of the main Lamberts Gully drainage line, and the area between the Co-Disposal REA and the Castlereagh Highway. The Project is proposing to improve the drainage along Lamberts Gully, separating clean water from the undisturbed areas of Ben Bullen State Forest to the south of the Springvale Coal Services Site and directing dirty water through a dirty water management system. Once this work is completed, the area surrounding the new clean water system will be rehabilitated.

5.3.2 Existing REAs known as 'A Pit' and Co-Disposal Area

There are two existing REAs within the Springvale Coal Services Site. The main REA is the final void of the Lamberts Gully Open Cut Mine ('A Pit'), used to dispose of coal reject, and is located on the southern boundary, south of the existing Washery and overland conveyor.

The second existing REA is known as the Co-Disposal REA, this consists of a series of tailings ponds and the retention dam located on the eastern boundary of the PAA.

There are commitments to rehabilitate the existing REAs to a standard acceptable to DTIRIS. These commitments are listed below:

- Prepare the A Pit Void to accept reject by cleaning the floor of the Lithgow Seam, constructing pond walls with coarse reject and establishing a suitable truck access using existing ramps. This has been completed;
- Seal exposed underground workings with coarse reject. This has been completed;
- Fill the remaining void space with reject. This is currently underway;
- Once filled, the surface expression of the REA is to conform to the 1992 EIS, and have no more than 4 Million tonnes above natural surface. This REA has yet to be started and lies within the proposed REA as described in Section 4.3.2;
- The currently approved emplacement will have an overall slope of no greater than 14^{o}. The emplacement will be constructed with approximately 10 m lifts and berm widths of 5 m for stability, erosion control and ease of rehabilitation. The maximum slope of the finished emplacement will be 3:1 (H:V);
- Material placed in the emplacement will meet a minimum requirement of 95% of Standard Maximum Dry Density;
- A drainage blanket will be placed beneath the emplacement to minimise build-up of water pressures within the emplacement. This will consist of compacted coarse reject; and
- Each lift will be battered, top-dressed and revegetated, prior to constructing the next lift.

The Co-Disposal REA is an above ground reject emplacement, consisting of an external earthen wall with separate internal tailings ponds, which are separated by coarse reject walls. There are 4 internal tailings ponds with two additional drainage ponds. The ponds are allowed to sequentially dry to a point enabling excavation and transport by truck to the A Pit REA.

The proposed rehabilitation work for this area is provided in Section 5.8.

5.3.3 Kerosene Vale Coal Stockpile Site

This site is within the PAA and is located on the Angus Place to Wallerawang Power Station Haul Road.

The site represents the former Newcom Colliery mine entries and surface facilities area, it is currently being used to store coal as required from Angus Place Colliery. The Kerosene Vale Stockpile Site provides for stockpiling up to 500,000 tonnes of coal.

As shown on **Figure 10,** approximately 7 ha of previously disturbed land associated with the original Newcom Colliery pit top has been rehabilitated. The remaining rehabilitation requirements relate to the area currently being used for coal stockpiling and underground mine entries. Rehabilitation works are also required for decommissioned buildings, infrastructure, and water management structures.

There are currently no commitments to advance rehabilitation while the site is being actively used for storage. A final Mine Closure Plan has been prepared and liaison with DTIRIS regarding the finalisation of the Plan is continuing. The proposed future rehabilitation works are described in Section 5.5 below.

5.4 Final Land Use Options

In determining the appropriate final land use for the Western Coal Services Project components, the suitability of the sites to sustain the selected land use, both as they currently exist and post-rehabilitation, needs to be considered. For the Springvale Coal Services Site, there are three potential land uses to be considered:

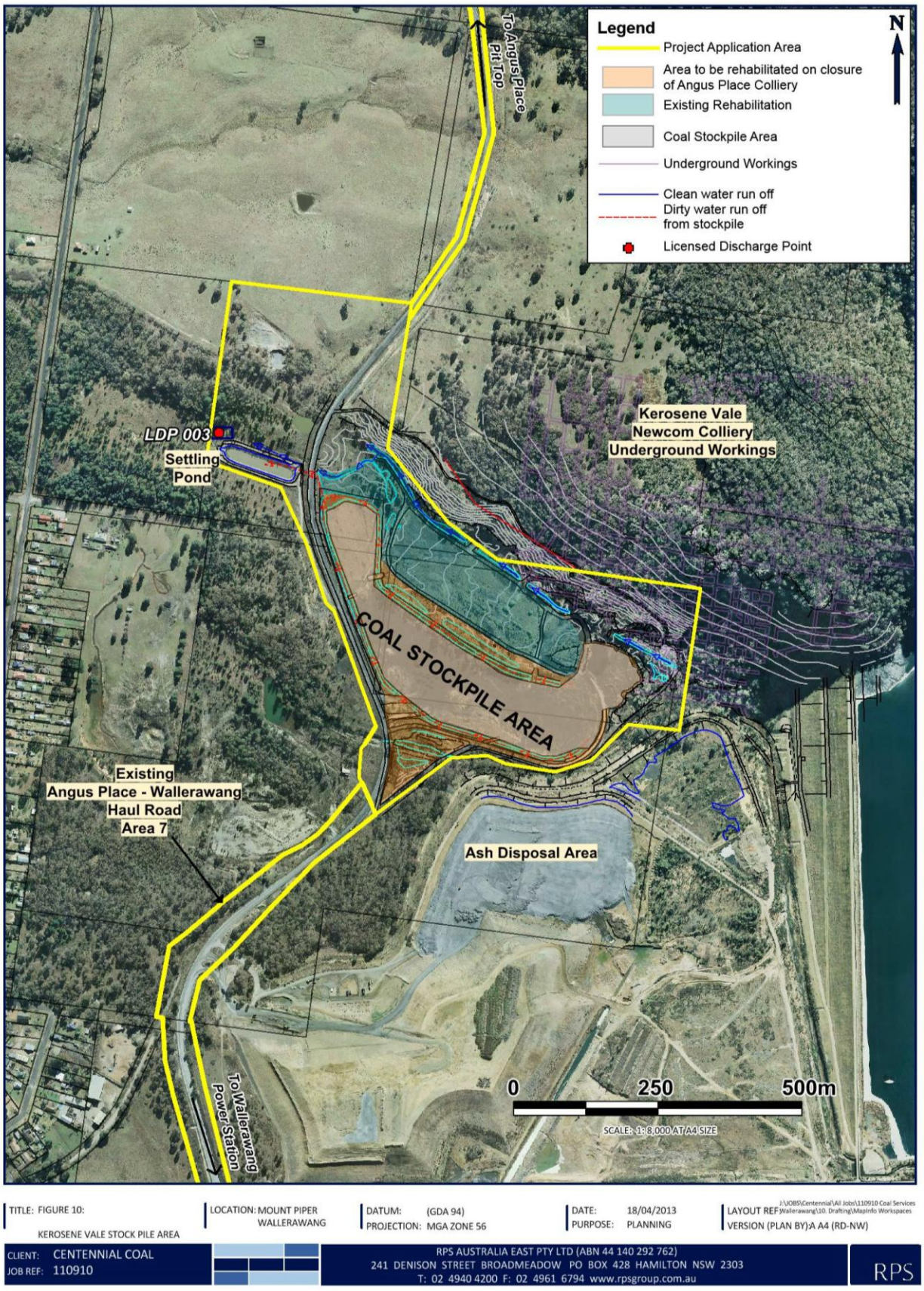
- Ash emplacement from nearby power stations;
- Industrial land use, including continuing use of existing private haul roads for access; and
- Reforestation and conservation.

Although the immediate prior land use was a mix of forestry and grazing, the majority of the Springvale Coal Services Site is now used for reject or ash emplacement. There are no available high quality soils on site, and the overall terrain would be unsuitable for anything other than low level grazing. There is currently no agricultural production land within the PAA and no Strategic Agricultural Land in accordance with the NSW Strategic Land Use Policy.

The Springvale Coal Services Site would be suitable for various industrial uses and is currently accommodating a reject treatment and reuse venture. A portion of the PAA is also planned to be a waste disposal facility operated by LCC, as illustrated in **Figure 3** in Section 2 of this EIS**.** The site has road access and is in close proximity to major power generating facilities and mining operations.

Components of the site would be suitable to return to a forest community comparable with the nearby Ben Bullen State Forest, which would be in line with the current rehabilitation plan under the Lamberts Gully Open Cut Mine approval. This approval also provides commitments for additional rehabilitation initiatives as an offset to the vegetation clearing associated with the open cut. These offsets included sections of the Lamberts Gully drainage line, which will be further separated from the dirty water system so it would, in future, operate solely to convey clean water from above the site to Wangcol Creek.

Figure 10 Rehabilitation Status Kerosene Vale Stockpile Area



The rehabilitation program for the Springvale Coal Services Site comprises a mix of rehabilitated stable landforms covering the reject emplacements and forest ecosystem for the remaining areas not identified for future industrial activities or ash emplacements. These areas have already been completed to the requirements of both Delta Electricity and LCC and no further work is proposed. The proposed final rehabilitation plan is provided as **Figure 11,** while the staging of this rehabilitation work is shown on **Figures 12** to **16.** These figures provide 5-year increments for site rehabilitation, however, the final rehabilitation at site closure would be subject to the preparation of a Mine Closure Plan within the last 3 years of operations – in accordance with DTIRIS requirements.

The Kerosene Vale site is located adjacent to the existing Wallerawang Power Station Ash Emplacement and there is the potential for the site to be used for ash disposal in the future. Unless a separate project is proposed for this land, the final land use for this site will be revegetation to a forest ecosystem compatible with the surrounding vegetation communities.

The overland conveyors represent mine infrastructure and will be dismantled on completion. This will see the land returned to its previous land use – predominantly, improved pasture.

The private haul roads will remain as roads to be used in the public or private road network.

5.5 Rehabilitation Domains

The PAA has been divided into the following rehabilitation Domains:

- Domain 1 – Washery and Coal Handling: this area includes the existing and proposed coal processing area, coal stockpiles, associated conveyors, access roads and storm water dams;
- Domain 2 – REA: this area incorporates both the existing approved REA and the proposed expanded REA;
- Domain 3 – Co-Disposal REA: this incorporates the old tailings dams and retention dam;
- Domain 4 – Cooks and DML dams and other water management structures;
- Domain 5 – Previous rehabilitation work and offsets associated with the Lamberts Gully Open Cut Mine;
- Domain 6 – Kerosene Vale Site; and
- Domain 7 – Haul roads and conveyors.

The above domains are shown on **Figures 17 to 18** and discussed further in the following section.

Figure 11 Rehabilitation Program Final Closure

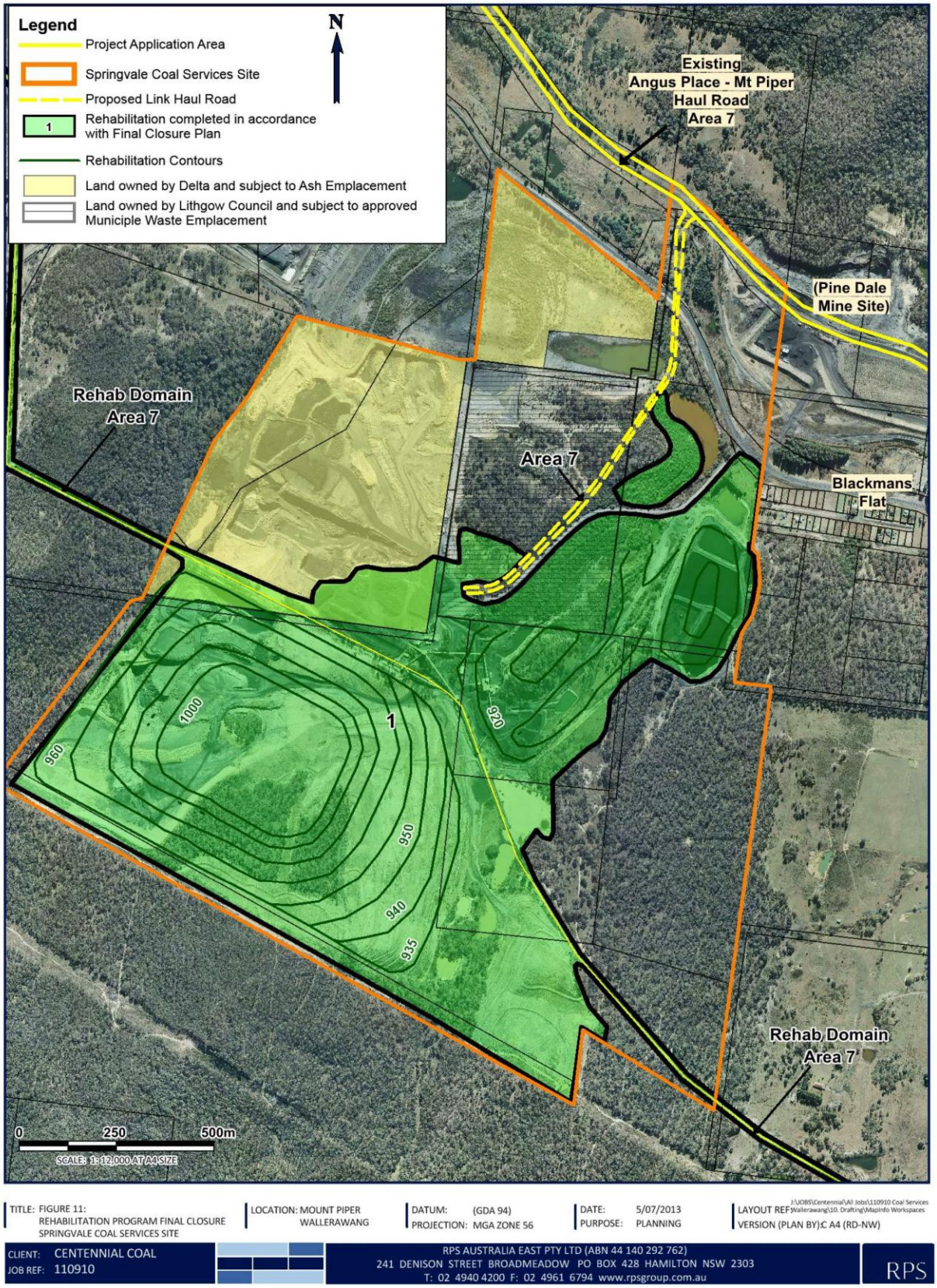


Figure 12 Rehabilitation Program Year 5

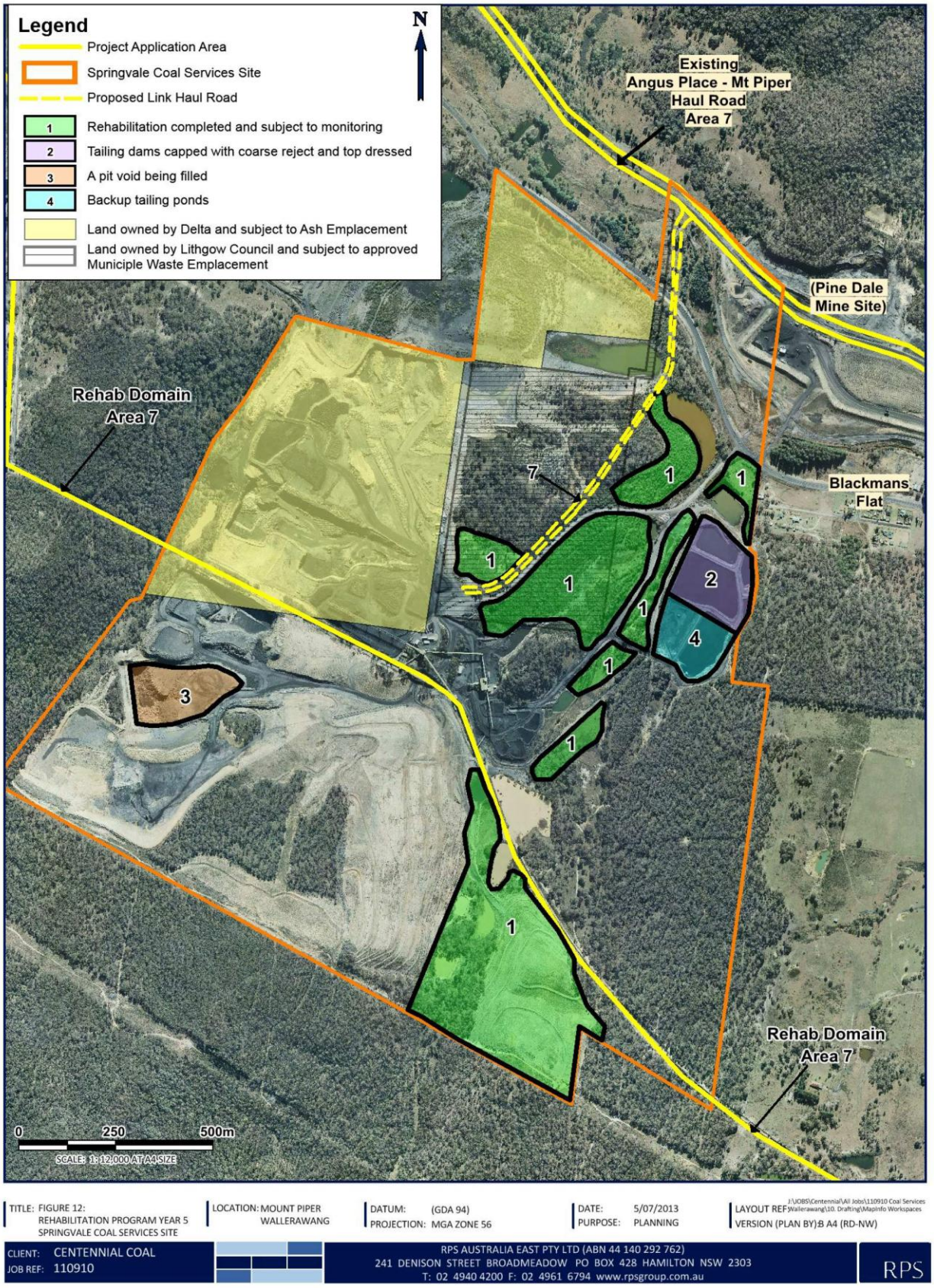


Figure 13 Rehabilitation Program Year 10

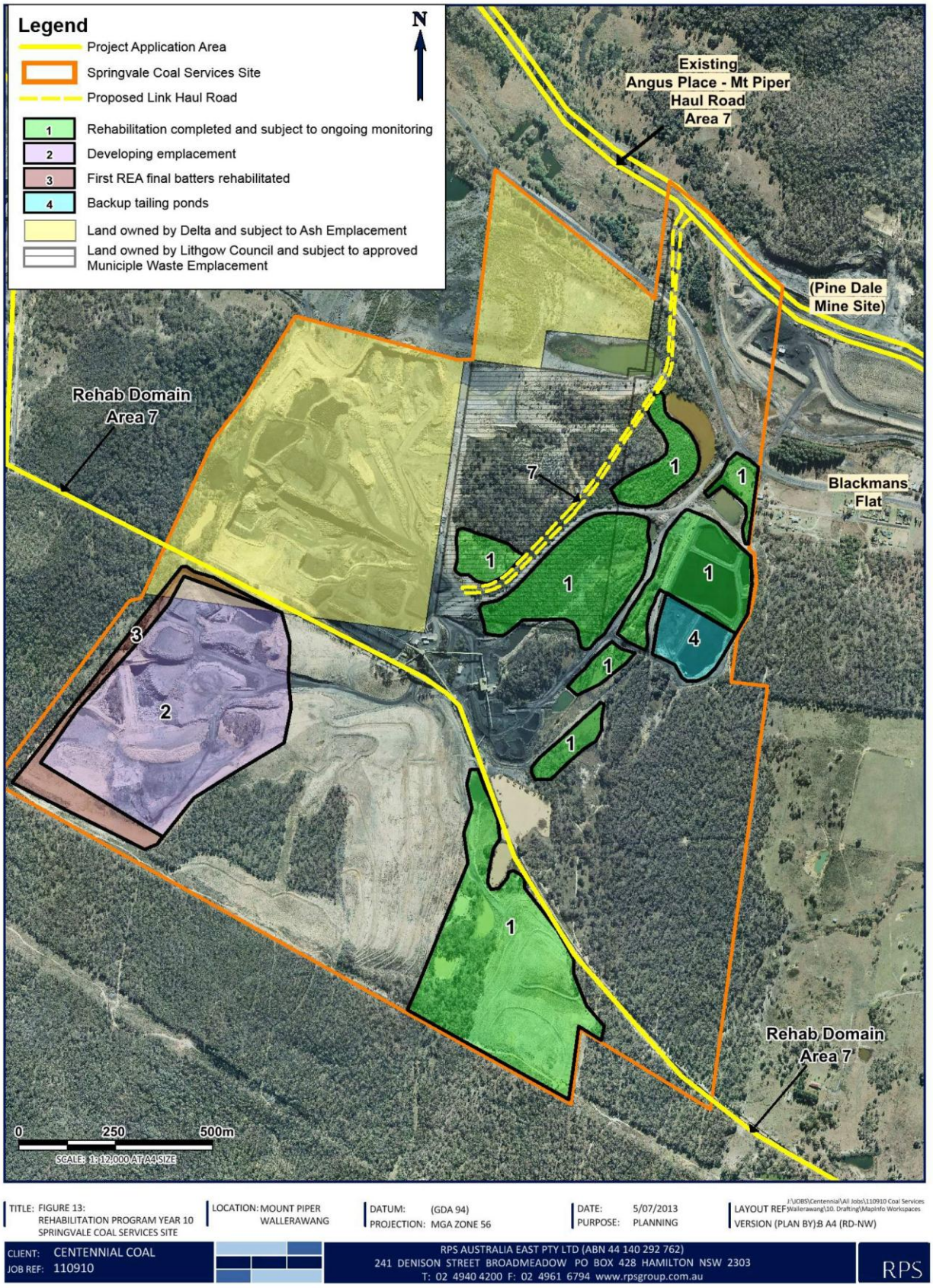


Figure 14 Rehabilitation Program Year 15

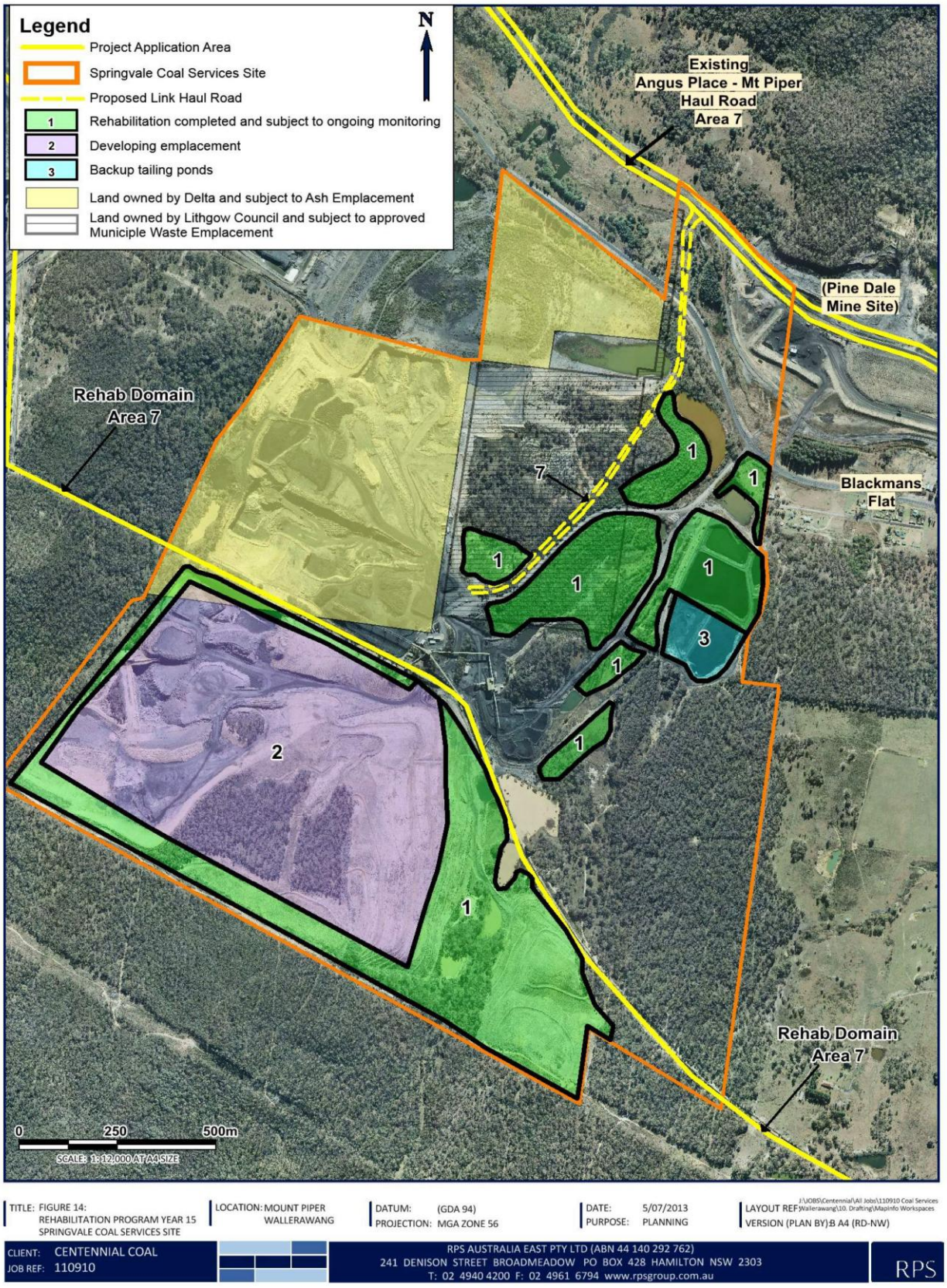


Figure 15 Rehabilitation Program Year 20

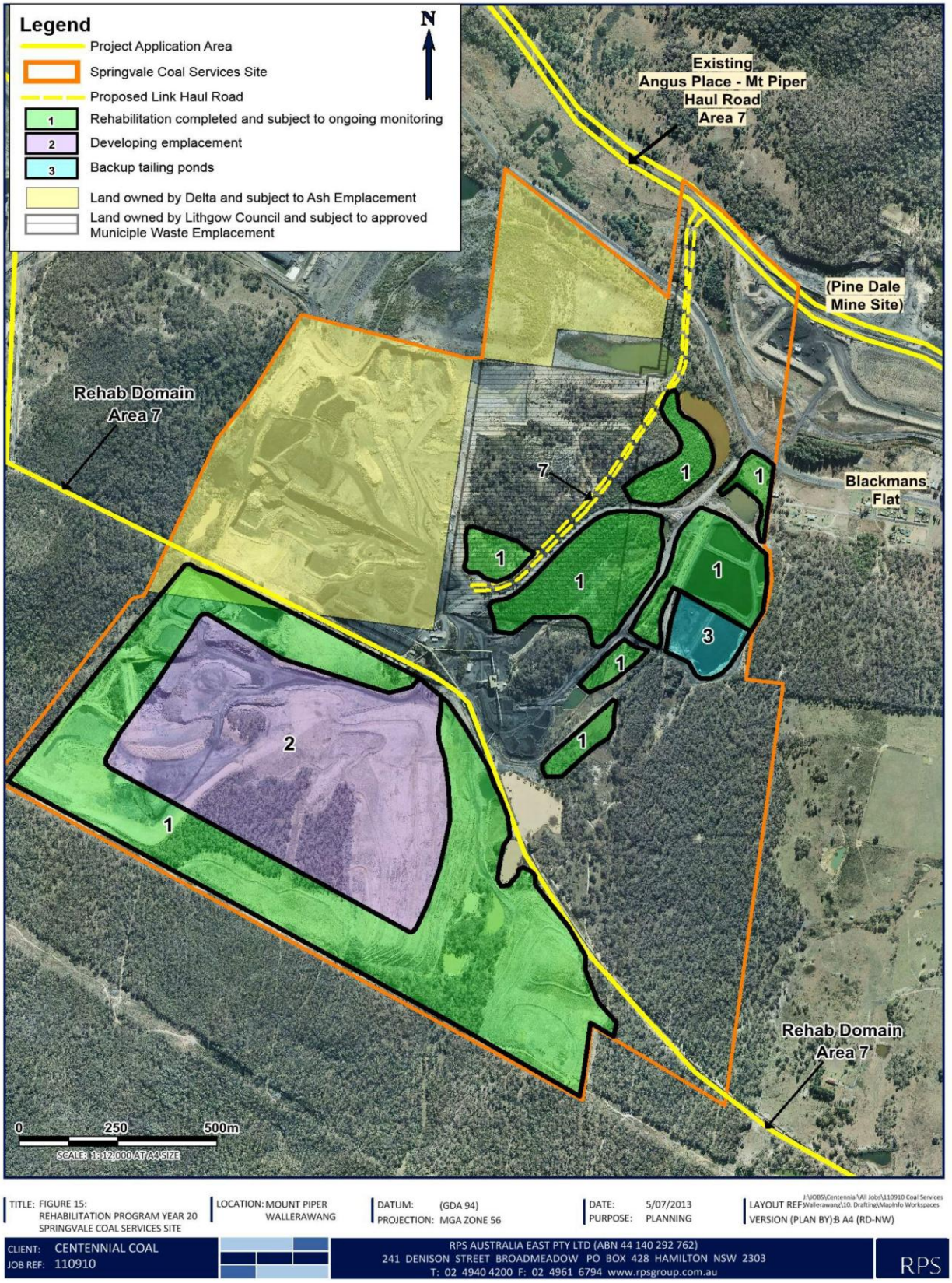


Figure 16 Rehabilitation Program Year 25

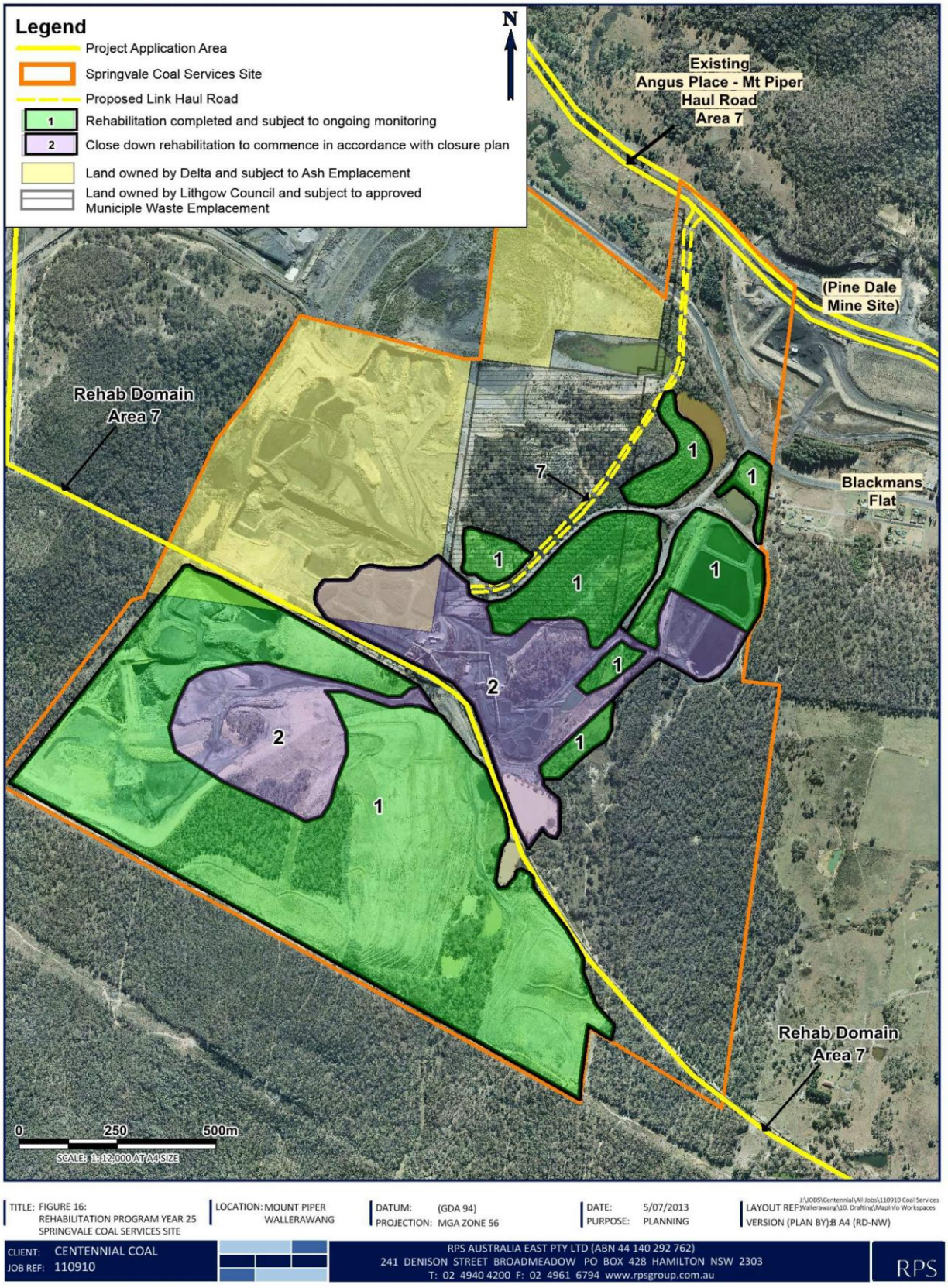


Figure 17 Rehabilitation Domains Western Coal Services Project

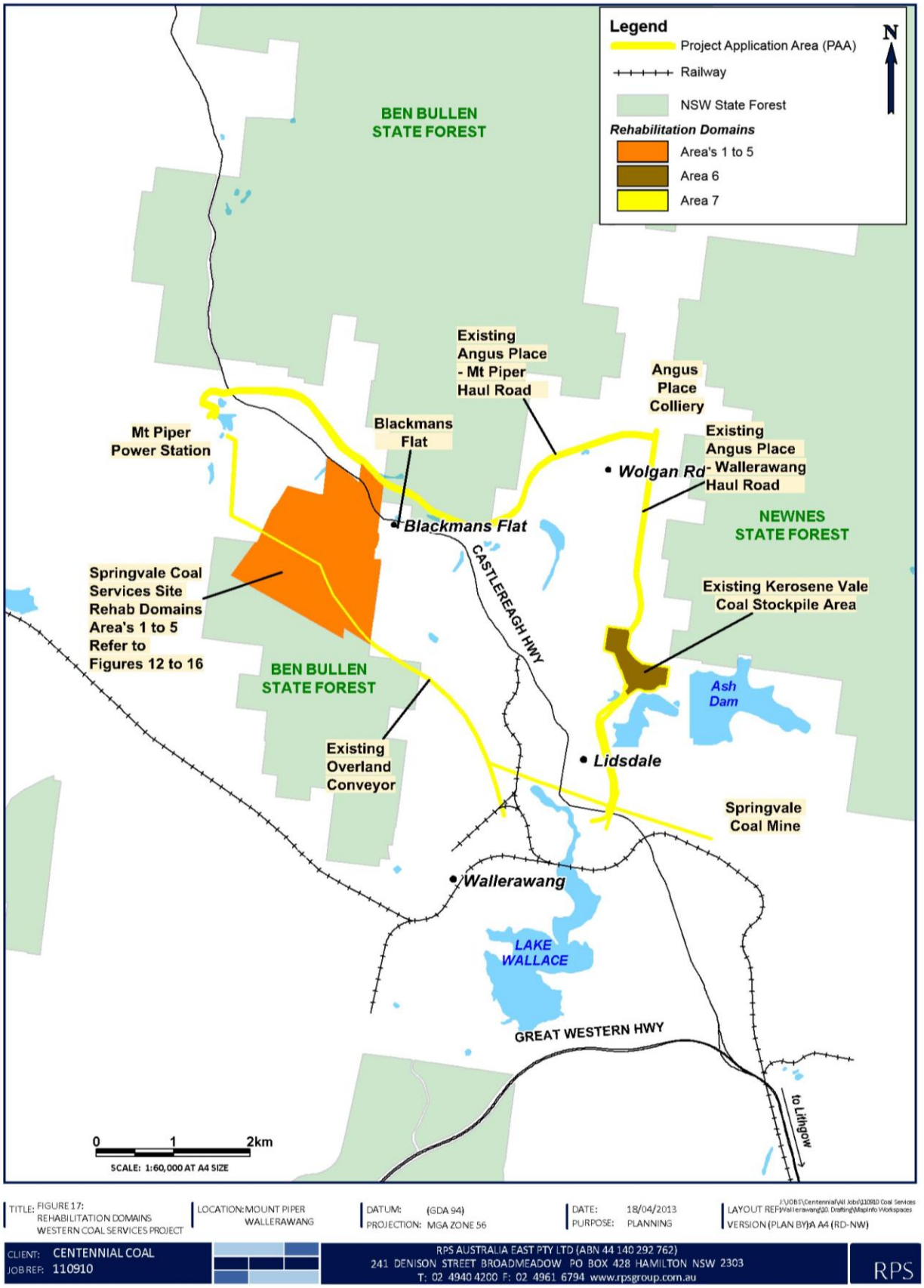
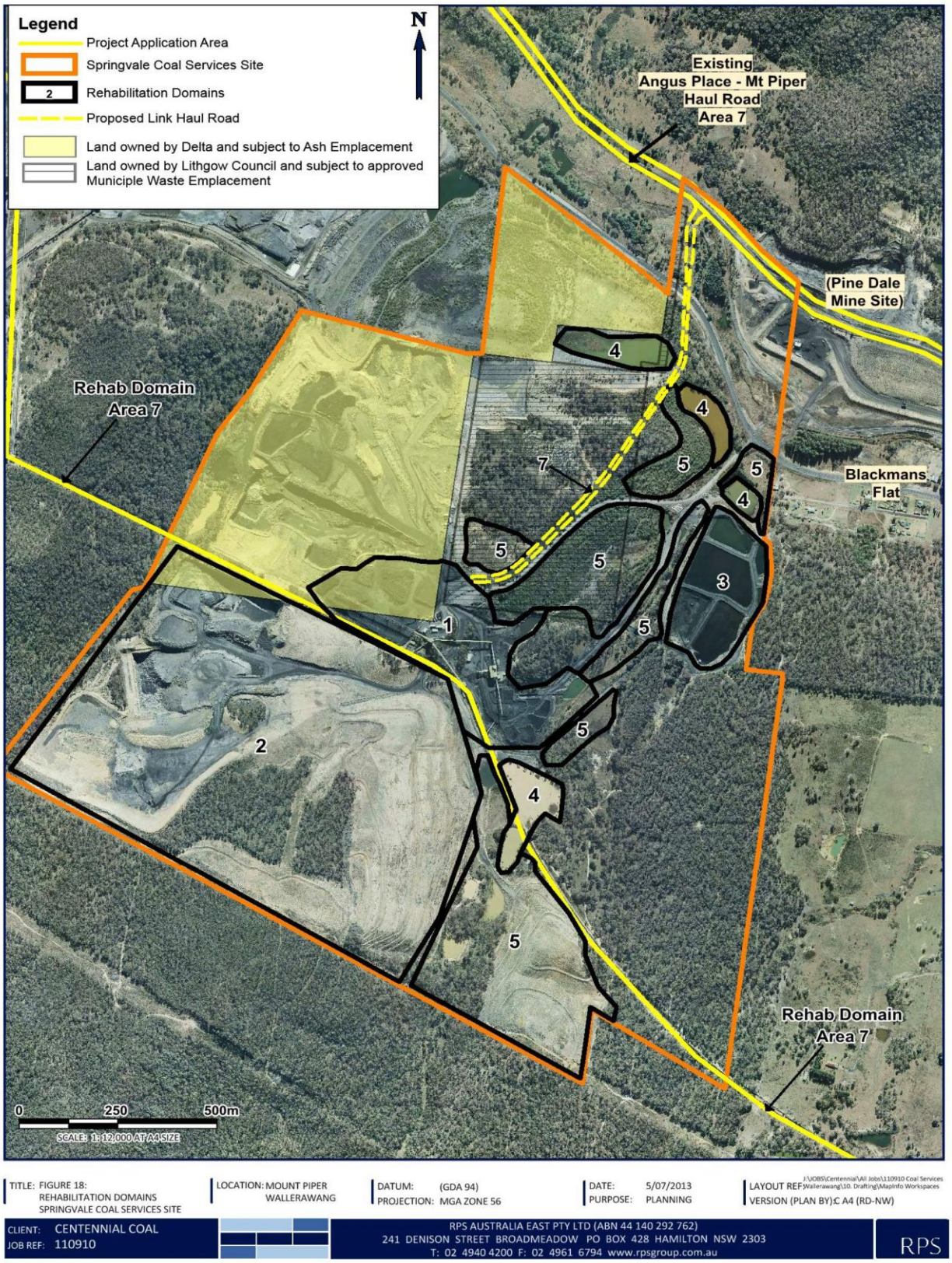


Figure 18 Rehabilitation Domains for Springvale Coal Services Site



5.5.2 Washery and Coal Handling Area – Domain 1

The Washery and Coal Handling Area lies on the floor of the Lithgow Seam, which was previously extracted by the original open cut in the 1940s prior to the development of the Western Main underground entries. The site is relatively flat but is surrounded by the old highwall to the west and north, and a natural hill to the east. This domain area drains in two directions and runoff is controlled by the Washery Dam to the north, and by the Stockpile Dam to the east. There is a road cutting to the north and infrastructure associated with the Washery and coal handling. Rehabilitation of this site would occur upon site closure. The rehabilitation activities would include:

- Removal of all infrastructure and services;
- Removal of all coal (including coal stockpiles), surface materials, and contents of dams and sumps;
- Reduce the angle of the old highwall batter by a combination of cut and fill. The cut may be done by throw blasting. The final angle should be no greater than 1:3 (Vertical:Height);
- Deep rip the sandstone base;
- Transport suitable topdressing material from drainage embankment around the REA and spread to a depth of 30 cm over the ripped base;
- Apply soil conditioners as required following soil testing. These may include mulch to increase organic content, fertilisers and gypsum to improve fertility and structure; and
- Revegetate using a mixture of direct sowing and tubestock planting – using species that support a stable landform for an industrial land use.

5.5.3 Reject Emplacement Area – Domain 2

The REA lies to the south of the overland conveyor to Mount Piper Power Station. It lies over a portion of the Lamberts Gully Open Cut Mine and incorporates the existing approved REA and its extension to the east.

The new REA will be developed progressively and rehabilitation activities will be delayed until such time as final external benches are completed. The first stage of the emplacement represents the completion of the existing REA as shown on **Figure 12**. This includes filling of the final void with reject to the level approved under the 1992 Springvale Mine consent.

Once this area is completed, the first lift (base of the expanded REA) will be developed. This will require the progressive shaping of the rehabilitated Lamberts Gully Open Cut Mine area from Year 10 onwards, as shown on **Figure 13**. Surface material suitable for earthworks will be separately stripped and used to construct the external drainage embankment.

The base of the REA will be progressively extended in line with reject production from the Washery. The preparation work for the REA base will progress at the same rate in order to minimise the area of disturbance. The base will be 5 m thick in total, but will be laid down in thinner layers to enable compaction under the normal operation of trucks dumping and dozer pushing over the surface.

The base of the REA varies from RL 930 to RL 950, with its lowest point on the north-east corner and will rise to RL 1000 at the centre of the REA.

The REA will have external batters of no greater than 1:3 (Vertical:Height) and 5 m high – this will be in line with geotechnical advice during development. Each lift will be separated by a 5.5 m wide bench, which would

grade back toward the rejects. This will enable access along the benches but also facilitate long-term stability. The benches will include drains to shed water from the face of the emplacement.

Once the first final external face is completed, rehabilitation works can commence. As shown on **Figures 12** to **16,** this will commence on the western edge of the REA once the mining voids have been filled. The full lateral extent of the REA will be reached between Year 10 and 15, as shown on **Figure 14**. To minimise dust generation from exposed areas prior to rehabilitation, temporary revegetation or other surface stabilisation methods will be applied.

REA cross-sections and a Typical Emplacement Section can found in **Figures 19** and **20** respectively.

The rehabilitation objectives of this domain include the:

- Progressive removal of sufficient overburden from the base of the REA to be used in progressive rehabilitation of the completed REA batters;
- Containment of all surface runoff in external drainage embankment and pollution control ponds, and the subsequent recycling of this water to the Washery;
- Rehabilitation of all final batters, including drainage embankments as soon as practical on completion;
- Undertaking of soil testing and characterisation to determine soil additives and fertiliser requirements;
- Revegetation of the completed benches using direct sowing and/or tubestock planting – using species suitable for use of rehabilitated REAs; and
- Establishment of a rehabilitation monitoring program and report the results each year in the AEMR.

Figure 19 Reject Emplacement Area Cross Sections

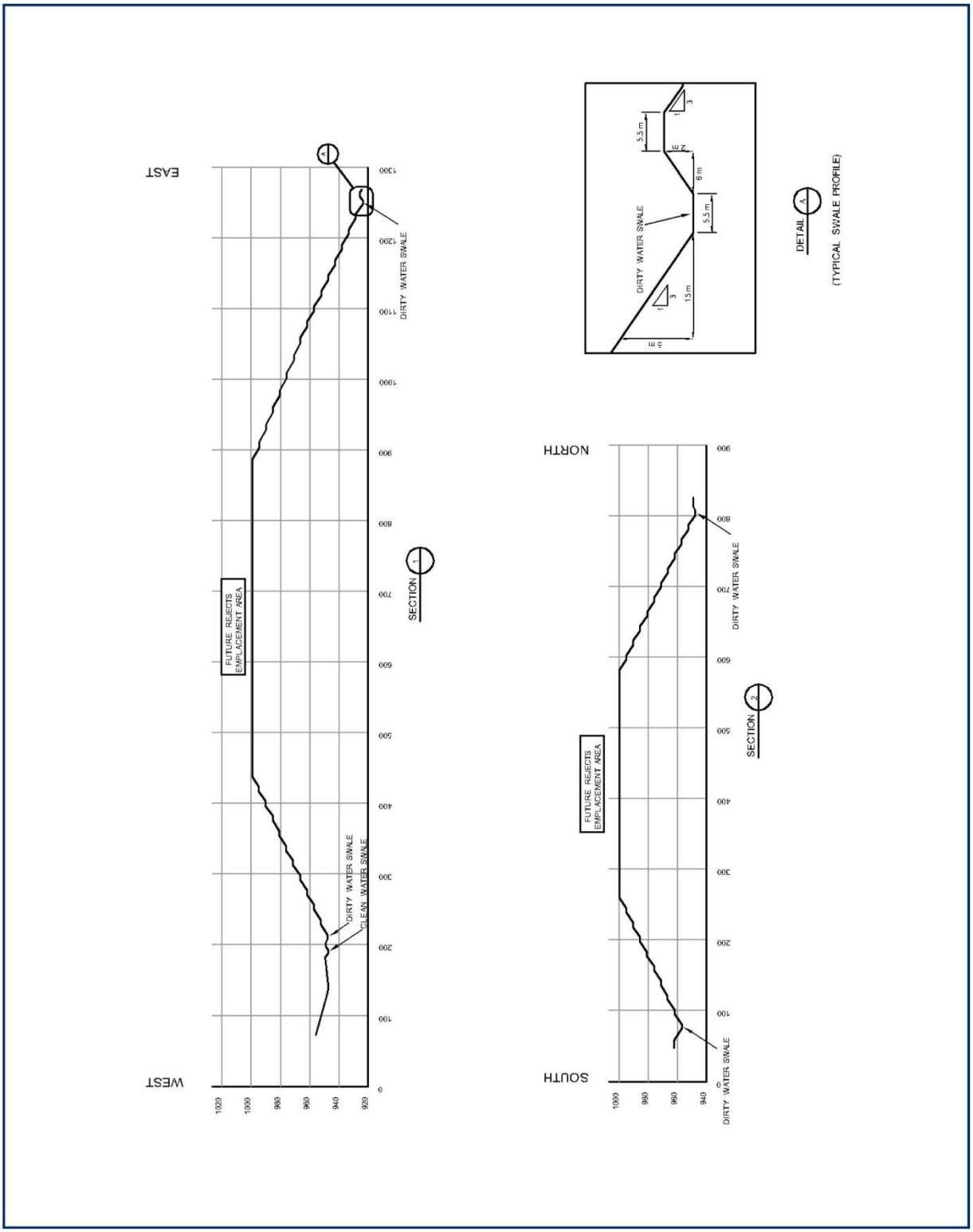
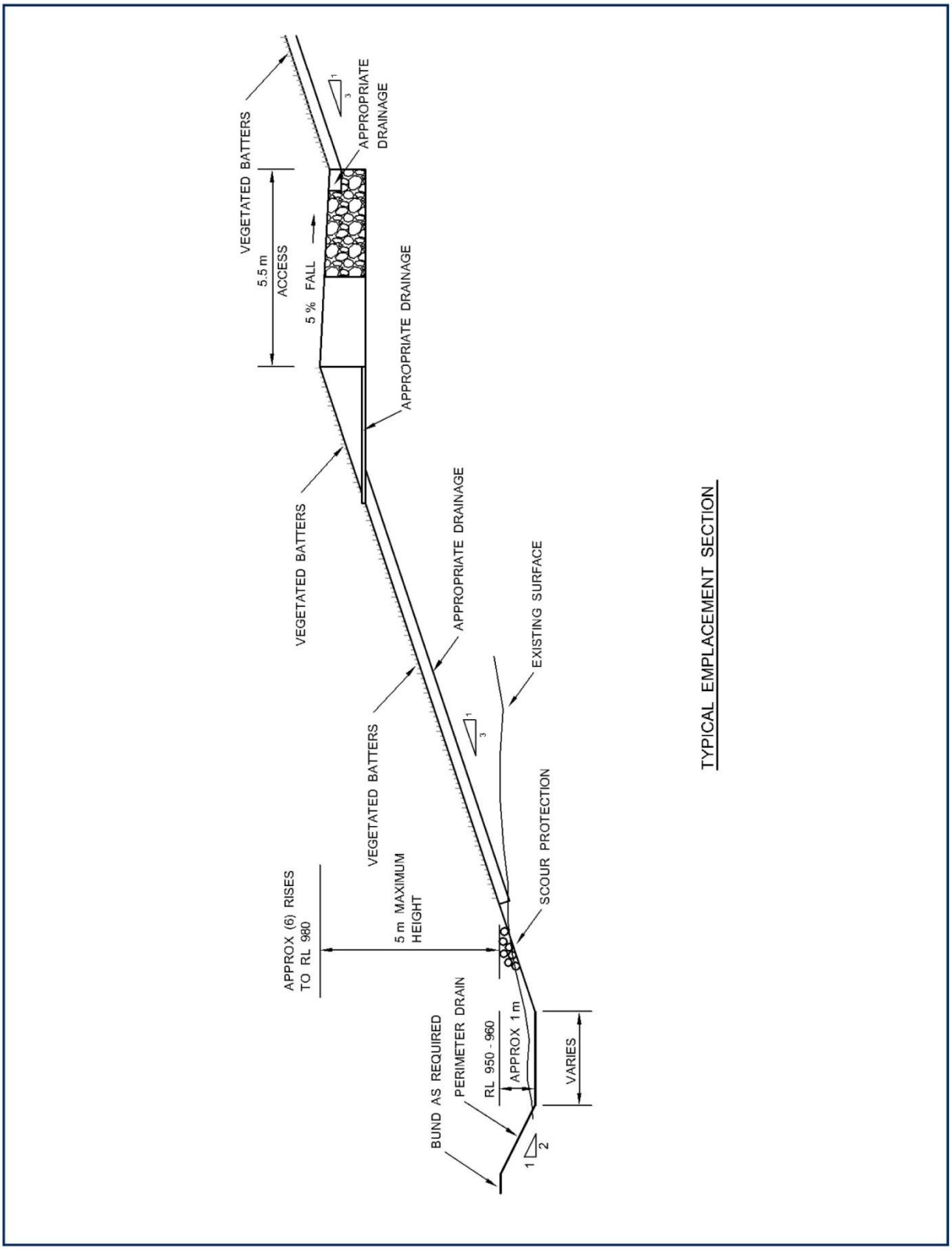


Figure 20 Typical Emplacement Section



5.5.4 Co-Disposal Reject Emplacement Area – Domain 3

The Co-Disposal REA is located near the main entrance to the Site and consists of a series of tailings ponds and the retention dam. The Co-Disposal REA has been used to dry the wet tailings prior to either blending them into the product coal, or transporting them to the REA. The Co-Disposal REA is divided into separate cells that are rotated to enable drying and excavation.

When the new Washery module is constructed, the 'fines reject' will be separately processed in a belt press filter to produce a 'cake' which is then mixed with coarse reject and conveyed to the main REA, thereby enabling the Co-Disposal REA to be rehabilitated.

As belt press filters require ongoing maintenance, there is a need to provide a backup system. It is proposed to utilise a portion of the existing Co-Disposal REA for this purpose, as it is already designed to accept wet tailings. The most suitable places to accept tailings are the two southern cells of the Co-Disposal REA.

This will provide the opportunity to rehabilitate the northern half of the REA that faces the Castlereagh Highway. As shown on **Figure 12**, this will be completed in the first 5 years of the Project.

Following completion of the clean water drainage along Lamberts Gully, the Retention Dam will collect water from the Co-Disposal REA and access roads. On final rehabilitation of the Co-Disposal REA, this dam will be rehabilitated. This will involve removal of the liner and backfilling

The rehabilitation objectives of this domain are therefore:

- Covering the northern half of the area with coarse reject to a minimum depth of 2 m in order to provide a stable cap to allow for rehabilitation in accordance with current DRE requirements;
- Covering the coarse reject cap with a minimum of 20 cm of topdressing material;
- Undertaking soil testing and characterisation to determine soil additives and fertiliser requirements. This will also include depth profiling to ensure that subsurface materials are not found to be hostile to future plant growth; and
- Revegetating the completed area using direct sowing and/or tubestock planting – using species suitable for use of rehabilitated REAs.

As shown in **Figure 11**, on final closure, the remaining two tailings dams will be rehabilitated in a similar fashion as above.

5.5.5 Cooks and DML Dams – Domain 4

These dams were constructed as part of the open cut activities on site. They form an essential component of the dirty water management system and will remain in operation for the life of the facility. Both dams will remain upon mine closure, as they will still form part of the drainage system for the approved ash emplacement and LCC waste disposal area.

These dams will be maintained as dirty water structures during the life of the operation, with leakage controlled and existing external vegetation maintained.

5.5.6 Previous Rehabilitation Areas– Domain 5

The Lamberts Gully Open Cut Mine approval included a commitment to undertake additional rehabilitation activities on site. Some of these areas are affected by the proposed Project, however, the majority fall within areas that will not be impacted, and these will continue to be rehabilitated in accordance with existing commitments. Domain 5 also includes completed rehabilitation areas associated with the Lamberts Gully Open Cut Mine, which will not be impacted by the project. Such areas, identified on **Figure 18,** will continue to be monitored until revegetation works are self-sustaining and satisfy the completion criteria.

The objectives of this area are to:

- Identify all areas which are not required for ongoing access or mining related purposes;
- Remove and/or cover carbonaceous materials in identified areas;
- Construct drainage network to direct clean runoff into the Lamberts Gully drainage line and dirty runoff into the existing pollution control ponds;
- Undertake civil works on the Lamberts Gully drainage line to ensure long-term stability. The design will include capacity to accept additional water from the Huon Gully drainage line, which is to be diverted to Lamberts Gully by Delta Electricity as part of its Lamberts North Ash Emplacement project;
- Identified clean areas can be revegetated using a mixture of direct sowing and tubestock planting; and
- Undertake soil testing and characterisation to determine soil additives and fertiliser requirements.

5.5.7 Kerosene Vale Site – Domain 6

The overall objectives for the rehabilitation program are as follows:

- Provide a stable final landform, with overall slopes no greater than 1:3 (V:H), by re-contouring shaping open cut spoil or in situ material;
- Maintain the current drainage system by directing dirty water towards the current pollution control pond and LDP;
- Top-dress the profile with suitable growing media, either generated from any future open cut workings or from existing material around the old mine entries;
- Remove and/or remediate remaining identified contamination;
- Undertake soil testing and characterisation to determine soil additives and fertiliser requirements;
- Progressively revegetate the site using direct sowing and/or tubestock planting – using species endemic to the surrounding vegetation communities;
- Establish a rehabilitation monitoring program and report the results each year in the AEMR; and
- Produce a vegetation community comparable with the surrounding vegetation systems, which represent the lower slopes of the Newnes State Forest to the east. On final closure of the site, all mine entries will be sealed in accordance with DRE Guideline MDG 6001.

5.5.8 Haul Roads and Conveyors – Domain 7

The haul roads will become part of the existing road network. The remaining coal handling infrastructure, including the overland conveyors, will be removed and the existing cut batters shaped. The conveyor running beneath the Castlereagh Highway will be removed and the tunnel and embankment filled and shaped.

The following rehabilitation objectives apply to the conveyor structures:

- Remove all belting, steel structures, electrical services, water pipeline, drives and gantries;

- Shaping of cut and fill batters as required to create a stable land form;
- Revegetation of the newly formed cut and fill batters using a mixture of direct sowing and tubestock planting as required; and
- Undertake soil testing and characterisation to determine soil additives and fertiliser requirements.

The section of overland conveyor between the Springvale Mine pit top and the Wallerawang Power Station link conveyor will be revegetated to a forest community comparable to surrounding vegetation. The remaining section of conveyor to the Springvale Coal Services Site and Lidsdale Siding crosses agricultural land. This easement would be returned to pasture of an equivalent grass mix as the surrounding paddocks. The section from the Springvale Coal Services Site to Mount Piper Power Station crosses land owned by Delta Electricity and borders the current ash emplacement area. This section will be rehabilitated in accordance with any specific requirements of Delta Electricity.

5.6 Strategic Rehabilitation Completion Criteria

The completion criteria for the selected domains are outlined in the following table:

Rehabilitation Phase	Completion Criteria
Decommissioning	▪ Remove all nominated infrastructure; ▪ Remove remaining carbonaceous material; ▪ Make safe any remaining footings; and ▪ Remove all remaining rubbish and debris.
Landform Establishment	▪ Create a stable land form; ▪ Final landform is consistent with surrounding landforms; ▪ Side slopes of the REA are 1:3 (Vertical:Height); ▪ Establish drainage systems as part of batter formation to ensure stability; ▪ Constructed contour banks and diversion drains to direct water into the new REA pollution control pond; and ▪ Completed REA batters to be top-dressed and sown within 6 months of completion.
Growth Media Development	▪ Progressively remove and stockpile available topdressing material from the base of the REA; ▪ Remove and stockpile all available topsoil from the haul road crossing of Wangcol Creek floodplain; ▪ Respread topsoil/topdressing media at a depth of 20 cm, or as required under the approved Closure Plan; ▪ Benchmark soil structure and nutrient status to establish target soil condition; ▪ Determine soil characterisation of the topdressing material and treat as necessary with soil conditioners and fertilisers; and ▪ Undertake follow-up soil testing every two years, or as considered necessary.
Ecosystem Establishment	▪ Undertake vegetation monitoring as required to determine target community structure and floristics; and ▪ Sow initial coloniser species with follow-up sowing and/or tubestock planting as required.
Ecosystem Development	▪ Continue monitoring until self-sustaining levels are confirmed; and ▪ Undertake maintenance work as required – including soil treatment, erosion control, weed spraying and re-sowing.
Closure	▪ Establishment of a self-sustaining vegetation community compatible with the chosen land use. Kerosene Vale Mine entries sealed in accordance with DRE Guideline MDG 6001.

5.7 Erosion and Sedimentation Controls

Whenever soils or land surfaces are disturbed, appropriate erosion and sedimentation controls will be provided. All erosion and sediment controls will be installed in accordance with the publication *Managing Urban Stormwater: Soils and Construction (Landcom) and associated Volume 2E: Mines and Quarries*. Erosion and sedimentation controls will be required during the construction phase, as well as during the ongoing construction of the REA. The existing site Water Management Plan and Erosion and Sedimentation Control Plan will be updated prior to construction to include specific details of the required erosion controls during construction, as well as any changes required to accommodate the new REA. These controls will consist of:

- Drainage Channels – to be constructed with either a parabolic or trapezoidal cross-section rather than a V-shape which can be easily eroded. Channels to be constructed with an adjacent earth bank constructed from the material excavated from the channel. The main drainage embankment around the new REA will conform to this and contain some internal drainage lines that are required to further separate clean and dirty water systems;
- Contour Banks – to be constructed around each bench of the new REA. These banks will be constructed in situ on the each bench with no greater than a 1 percent fall, to allow stable passage of water. Depending on the overall length and profile of the slope, small check dam structures maybe constructed to slow water flow;
- Absorption Banks – these are the same as a contour bank, but are constructed along the contour and then tapered up at each end. Runoff from the batter will be therefore contained within the bank with no discharge at either end. These will be used in selected areas required to retain as much water as possible within the bank to assist with rehabilitation;
- Sediment Basins – although there are several of these around the Springvale Coal Services Site, more will be required as part of the development of the REA and to aid the separation of dirty water from the clean water system. The two existing sediment basins located near the Lamberts Gully drainage line at the base of the rehabilitated open cut, will be used and will eventually direct water away from the Conveyor Dam, discharging instead into a new sediment basin which will overflow into the Washery Dam. Other smaller structures will be required to contain water during the construction of the REA and Link Haul Road. The primary purpose of these basins will be to contain sediment from normal rainfall events and to reduce flow-velocity during high rainfall events;
- Energy Dissipaters – will be constructed from rock rubble and will be located where necessary within the proposed drainage system. These will provide additional erosion protection during high-flow conditions. Typically, they are used to convey water from one bench of the REA to the next, but they can also be necessary when water passes through steeper channels; and
- Sediment Fences – will be used extensively and erected prior to earthworks commencing. The purpose of the fence will be to filter runoff from disturbed areas, trapping the sediment and allowing filtered water to pass through. The reason for using a filter fabric instead of a straw bale filter in most applications will be the ease of removing trapped material to be returned to the topsoil stockpile. These will be particularly important during the construction of the new private Link Haul Road, as runoff may otherwise enter Wangcol Creek.

5.8 Topsoil and Topdressing Management

Topsoil management is also important during the construction program. Although no additional topsoil will be generated during the construction of the REA and Washery, the Link Haul Road will cross the floodplain of Wangcol Creek and topsoil here will need to be stripped and stockpiled for later use in the rehabilitation of the road batters. The time between topsoil stripping and respreading on the completed batters is anticipated to be less than 6 months. As such, separate sowing of these stockpiles is not considered necessary. However, in order to minimise loss of soil fertility and physical properties, topsoil stockpiles will be less than 2 m high, 4 m wide at the base, and of a length governed by the amount of topsoil generated.

Should topsoil be required to be stockpiled for a period greater than 6 months, then a sterile cover crop and light fertiliser application will be made to provide stability and maintain organic matter. Any excess topsoil at the completion of the road batters will be transported to the Springvale Coal Services Site for use as required.

Although there is no remaining original natural topsoil on site, the REA will be developed on rehabilitated land previously disturbed by the Lamberts Gully Open Cut Mine. As the footprint of the REA expands, the surface topdressing and suitable underlying overburden material will be stripped and used either directly on completed emplacement batters, or to construct the drainage embankment around the ultimate footprint of the REA. Approximately 150,000 m^3 of topdressing material will be required to rehabilitate the ultimate surface of the REA. A further 18,000 m^3 will be required for topdressing the Co-Disposal area, while miscellaneous areas will take another 2,000 m^3. This represents less than 30 cm depth to be stripped from the base of the future REA.

As the REA will be progressively rehabilitated during the life of the facility, the lower drainage embankment would not be required as a permanent structure. It can therefore be removed on final closure and the material used as topdressing for the remainder of the site as required.

5.9 Rehabilitation Monitoring

Rehabilitation monitoring is carried out in order to verify that that the completion criteria for the rehabilitation outcomes are met. In some cases, such as the removal of infrastructure or design of the final landforms, this represents a simple yes or no answer. However, the completion criteria for creating a self-sustaining vegetation community that is compatible with the surrounding native communities requires a more complex monitoring process. There are several monitoring tools and protocols currently being used in the industry to assist with this process but ultimately, they all involve:

- Benchmarking of the target vegetation community. This involves determination of structure and floristics of the desired final vegetation community. The desired community will differ for each component of the PAA. In this case, this would involve investigation of forested areas around the Springvale Coal Services Site, adjacent to the overland conveyor near the Springvale Mine access road, and the Kerosene Vale stockpile site, as well as agricultural land along the conveyor route to the Springvale Coal Services Site;
- Benchmarking target soils, including testing for: nutrient content, organic matter and structure. As with benchmarking vegetation communities, the required soils will vary – from relatively low nutrient sandstone based soils through to more structured fertile soils which support stock grazing;
- Development of appropriate soil treatments, seed and/or tubestock mix, taking into account natural succession processes; and
- Ongoing monitoring of vegetation community development and determination of the stage at which the community is self-sustaining. This usually involves a combination of successful flowering and seed development of target key species and soil development.

The outcomes of rehabilitation activities and monitoring work will continue to be provided each year in the AEMR.

5.10 Indicative Closure Timeline

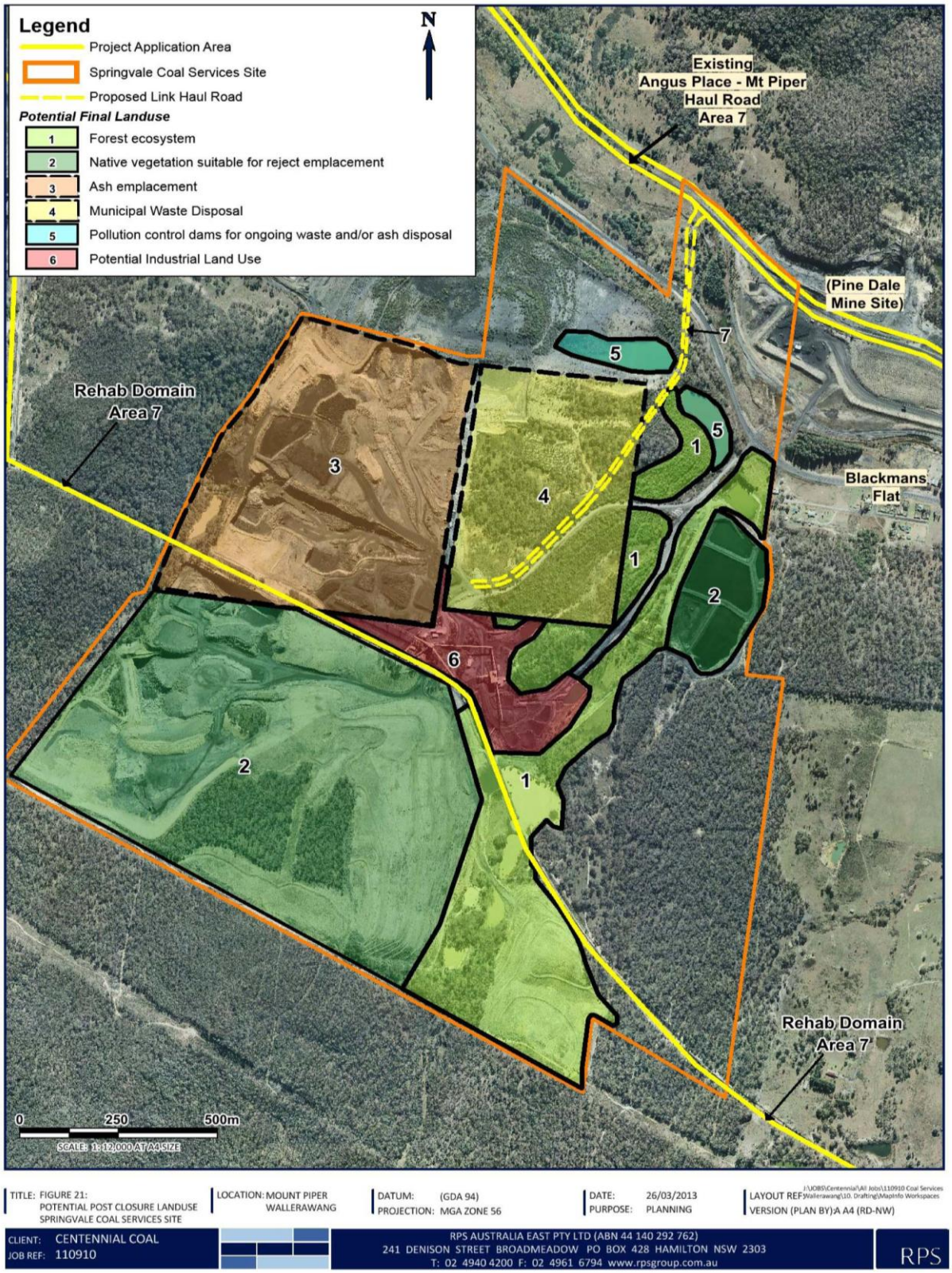
An indicative closure timeline is shown in **Table 7.** This table sets out the required closure planning activities, which will commence 5 years prior to the closure of the facilities. The table also indicates which activities will extend beyond the cessation of coal processing and transport. **Figure 11** shows the final closure status. **Figure 21** shows the potential post-closure land uses for the Springvale Coal Services Site.

This timeline covers the removal of nominated infrastructure and final rehabilitation activities. However, it should be noted that some areas may be relinquished much more quickly if limited additional work is required. These would include rehabilitation works completed more than 10 years prior completed rehabilitation older than 10 years or infrastructure that can be used for other beneficial purposes – such as the haul roads.

Table 7 Indicative Closure Timeline

Years From Closure	Closure Planning					Decommissioning and Rehabilitation				Monitoring and Maintenance				Relinquishment	
	–5	–4	–3	–2	–1	1	2	3	4	5	6	7	8	9	10
Closure Planning															
Stakeholder consultation regarding closure															
Agreed final detailed closure strategy															
Develop an Infrastructure Demolition Plan															
Closure Activities															
Demolition of infrastructure															
Final earthworks															
Landform establishment															
Growth media establishment															
Vegetation establishment															
Vegetation development															
Post Closure Activities															
Maintenance of Rehabilitated Areas															
Monitoring and Inspections															

Figure 21 Potential Post Closure Land Use



6.0 Engagement and Community Initiatives

6.1 Introduction

Land use in proximity to the Springvale Coal Services Site is primarily industrial including power generation, coal handling and processing and coal mining. The small residential locality of Blackmans Flat is located on the eastern boundary of the Springvale Coal Services Site and consists of 11 dwellings in the main residential area with a small number of other dwellings dispersed further to the east.

Consultation has been undertaken with federal, state and local government agencies, in addition to community stakeholders including the main residential area of Blackmans Flat, and representatives from Delta Electricity and Pine Dale Mine, during the preparation of this EIS.

6.2 Stakeholder Engagement Plan

Springvale Coal has developed and implemented a Stakeholder Engagement Plan for the Project. The Plan identifies relevant government and community stakeholders, the methods of engagement and the outcomes of the engagement strategy. Springvale Coal recognises that effective engagement is a key deliverable for the Project and forms an integral part of the ongoing operation of the Project.

Community engagement goes beyond making information available or gathering information about opinions or attitudes, rather, it is about active exchanges of information and viewpoints. These exchanges provide an understanding of the community's needs, issues, values and aspirations which is required not only to assess the social impacts of the Project, but to maintain effective long term relationships. These relationships are integral to Springvale Coal's approach to business. Springvale Coal has utilised the services of James Marshall and Co (formerly Lantz Marshall) to assist in:

- Developing the stakeholder engagement strategy for the region;
- Working with the community to understand the nature of Springvale Coal's business;
- Developing indicators of engagement success;
- Identifying improvement opportunities to maximise engagement effectiveness; and
- Working with the Blackmans Flat community.

This support has enabled Springvale Coal to understand the immediate needs of the community and, whilst not always agreeing with proposed outcomes, develop meaningful communication strategies on the nature, extent and impacts of Springvale Coal's operations and projects.

Springvale Coal has continued to develop working relationships with key government agencies. Springvale Coal management meets regularly with state and federal government agencies, and operational and project teams meet with local regulators to discuss the nature and extent of Springvale Coal's potential impacts.

6.3 Community Engagement

In early 2012 Springvale Coal commenced a regional engagement process involving four Projects, the Western Coal Services Upgrade, Lidsdale Siding Upgrade, Springvale Coal Mine and Angus Place Colliery modifications.

Community Information Sessions were held at the Country Women's Association premises in Wallerawang on:

- Wednesday 14th March, evening session from 4 pm to 8 pm;
- Saturday 17th March, morning session 9 am to 1 pm; and
- Tuesday 20th March, morning session 9 am to 1 pm.

Information was further disseminated by:

- A letter-box drop of leaflets during early March 2012 inviting the regional community to the abovementioned Community Information Sessions; and
- A series of articles and advertisements placed in the Lithgow Mercury to provide the regional community with an update on the Project.

Springvale Coal representatives from the Project were present at all three sessions. Information boards with project plans and illustrations were on display. The outcomes of the sessions were then reported in an article in the Lithgow Mercury on 21 April 2012.

6.3.1 Community Engagement Results

In general, issues raised by the broader community were largely in relation to the wider regional developments. These issues were:

- General visual impacts, particularly from open cut mining;
- Intensification of mining activities; and
- The recognition of impacts from sources other than Centennial such as other mining operations and the two power stations.

6.3.1.1 Blackmans Flat

Following the Community Information Sessions in March 2012, a submission was prepared by residents of Blackmans Flat outlining their opposition to the Western Coal Services Project. The issues raised were:

- Existing cumulative impacts from all the nearby projects have resulted in the loss of property values, increased noise including from blasting and truck movements, health issues relating to dust, visual impacts, restricted access to areas of the forest once enjoyed for walking and an overall loss of amenity;
- Concern about further Projects, including the Western Coal Services Project, expansion of Pine Dale mine, the ash emplacement area for Delta, open cut mine in the Ben Bullen State Forest, waste management site and the proposal to rezone Blackmans Flat as industrial would have further impact on residential amenity; and
- Acknowledgement that industry is an important factor to the area's economy and industry in the Blackmans Flat area makes a significant contribution to the local, regional and state economy. However, these benefits have had an adverse impact on the social amenity in Blackmans Flat main residential area.

In response to the submission, Springvale Coal has engaged directly with the residents of the Blackmans Flat main residential area. Further comments raised were:

- Residents have lived in the area between five (5) and 70 years;
- Residents moved to the area for a number of reasons including cheaper housing, some came to enjoy the rural amenity prior to the expansion of industry and some with knowledge of nearby industry;
- Surrounding industry has impacted on the social amenity of the area affecting the day to day life of residents. Impacts include noise, vibration, dust and reduced visual amenity; and

- There have been a number of submissions over the past five (5) years to politicians regarding better management of these impacts and requests for compensation and relocation from the area.

Given its proximity to the Project, Springvale Coal has focussed its community engagement strategy on continued and continuing active engagement with the residents of Blackmans Flat. Further discussion about community engagement, in particularly with the residents of Blackmans Flat, is provided in the Section 9.5.5 and Section 9.6.5 and in the Social Impact Assessment contained in **Appendix 7.**

6.3.2 Addressing Community Issues

During the environmental impact assessment process, alternative layouts have been considered and impacts to Blackmans Flat have been minimised. Two options for the route of the proposed Link Haul Road have been considered during the assessment, as detailed in Section 8.1.1. The western alignment, located furthest away from Blackmans Flat, has been selected partly due to lesser noise and visual impacts on the residential area compared to the eastern alignment.

In the original design for the Springvale Coal Services Site, the REA was to be located nearer Blackmans Flat, to the south of the existing Co-Disposal area. Further investigations, including the potential impacts to biodiversity resulted in a redesign of the existing REA to accommodate the proposed life of mine reject material.

The existing location of infrastructure within the Springvale Coal Services Site provides little flexibility for consideration of alternative project design and layout on the Springvale Coal Services Site. As such, the Project will implement measures to mitigate noise, dust and visual impacts to Blackmans Flat. These measures include those outlined in Sections 9.5.1, 9.5.2 and 9.5.8 of this EIS.

Springvale Coal has recognised that whilst these measures alone will minimise the impacts of the Project, the Project contributes to the existing situation that is already subject to cumulative impacts.

6.3.3 Aboriginal Engagement

Aboriginal community engagement has been undertaken in accordance with the NSW Aboriginal Cultural Heritage Consultation Requirements (ACHCRs) for Proponents (Department of Environment, Climate Change and Water (NSW) (DECCW) 2010). Section 9.5.9 and the associated Cultural Heritage Assessment in **Appendix 11** provide further information about the consultation undertaken. The following Aboriginal community stakeholders registered their interest in the Project:

- Warrabinga Native Title Claimants Aboriginal Corporation;
- North-East Wiradjuri;
- Bathurst Local Aboriginal Land Council;
- Gundungurra Tribal Council Aboriginal Corporation;
- Mingaan Aboriginal Corporation; and
- Mooka Traditional Owners.

On the 7 December 2011 Springvale Coal held an archaeology community meeting for all interested stakeholders. During the meeting, all interested stakeholders formally registered their interest in the Project. Representatives of registered Aboriginal groups were invited to attend the presentation and to discuss the proposed methodology for completing the cultural heritage survey and assessment. Although representatives of all Aboriginal stakeholders attended the December 2011 meeting, only six responded to the survey methodology, which was a precursor to their expression of interest to participate in survey work. The six stakeholders were:

- Warrabinga Native Title Claimants Aboriginal Corporation;
- North-East Wiradjuri;
- Bathurst Local Aboriginal Land Council;
- Gundungurra Tribal Council Aboriginal Corporation;
- Mingaan Aboriginal Corporation; and
- Wiray-dyuraa Ngumbaau-dyil.

After responses to the survey methodology were collected, RPS issued formal invitations to the six Aboriginal stakeholder groups to participate in field survey. Aboriginal site officers were only provided from four of the six Aboriginal stakeholder groups that had expressed an interest in the Project and responded to the survey methodology.

The field survey for the Project was undertaken in January 2012 and was attended by representatives of the following Aboriginal groups:

- North-East Wiradjuri;
- Bathurst Local Aboriginal Land Council;
- Mingaan Aboriginal Corporation; and
- Warrabinga Native Title Claimants Aboriginal Corporation.

Further information is provided in Section 9.5.9 and the associated Cultural Heritage Assessment in **Appendix 11**.

6.4 Government Engagement

Consultation with government stakeholders has occurred, and a summary of the responses received and the responses to the issues raised are identified in **Table 8**. Copies of the government stakeholders responses are contained in **Appendix 1.**

Table 8 Summary of the State Agency Responses Received

Agency	Date and type of consultation	Issues Raised	Responses to Issues Raised
NSW Environmental Protection Agency (on behalf of the Office of Environment and Heritage (OEH))	8 March 2012 Letter from EPA in response to Government Briefing Paper accompanying request for DGRs. Attendance at a two day Government Briefing held on 17 and 18 October 2012 about a number of Centennial projects including Western Coal Services Project.	Air quality: ▪ Identify point and diffuse dust emissions for all Project stages; ▪ Justify level of assessment undertaken on the basis of risks factors including but not limited to; proposed location; characteristics of the receiving environment; and type and quantity of pollutants emitted; ▪ Consider worst case emissions and assess cumulative emissions; ▪ Identify point and diffuse dust emissions; ▪ Assess risk of environmental harm to human health and amenity; ▪ Justify level of assessment undertaken; ▪ Detail receiving environment; ▪ Consider worst case and cumulative emissions; and ▪ Undertake dispersion modelling.	Addressed in EIS at Section 9.5.2.
		▪ Noise modelling using INP and Construction guidelines.	Addressed in EIS at Section 9.5.1.
		▪ Identify and categorise wastes including tailings.	Addressed in EIS at Section 9.5.16.
		▪ Detail erosion and sedimentation controls.	Addressed in EIS at Section 9.5.4 and Section 10.
		▪ Assess soil and land resources.	Addressed in EIS at Section 9.5.11.
		▪ Describe water usage, water quality and frequency of discharges; ▪ Water balance and describe surface and groundwater; ▪ State water quality objectives for receiving waters; ▪ Assess impacts of groundwater dependent ecosystems; and ▪ Assess GDEs, stormwater and monitoring proposals.	Addressed in EIS at Section 9.5.3, 9.5.4, 9.5.6 and 9.5.7.
		▪ Archaeological assessment required.	CHA undertaken and addressed in Section 9.5.9
		▪ Identify and categorise waste.	Addressed in EIS at Section 9.5.16.
		▪ Assess against EPBC Act.	The Flora and Fauna Assessment addresses the requirements of the EPBC Act in Section 9.5.6.

Agency	Date and type of consultation	Issues Raised	Responses to Issues Raised
NSW Transport Roads and Maritime Services (RMS)	8 March 2012 Letter from RMS in response to Government Briefing Paper accompanying request for DGRs.	▪ Reference to proposed workshop for planning road infrastructure; ▪ Traffic study to include origin-destination of vehicles, construction and operation; ▪ Intersection assessment and treatments; ▪ Internal traffic movement and parking ▪ Details of infrastructure and intersection treatments; ▪ Include traffic generated by Pinedale; and ▪ Design and construction of the overpass will be administered through a Works Authorisation Deed and agreement.	Addressed in EIS at Section 9.5.10.
RMS	12 October 2012 Letter from RMS in response to the revised Government Briefing Paper.	▪ Reference should be made to Austroads Guides and RMS Supplements to Austroads Guides.	Addressed in EIS at Section 9.5.10.
NSW Department of Resources and Energy (DRE)	9 March 2012 Letter from DRE in response to Government Briefing Paper accompanying request for DGRs.	▪ Post mining land use; ▪ Rehabilitation objectives and domains; ▪ Rehabilitation methodology; ▪ Strategic Rehabilitation completion criteria; and ▪ Conceptual final landform design.	Addressed in EIS at Section 5.
Department of Primary Industries	15 March 2012	▪ No issues relating to agricultural land in relation to the Project.	Noted however refer to Section 9.5.11.
Lithgow City Council (LCC)	12 March 2012 Letter from LCC in response to Government Briefing Paper accompanying request for DGRs.	DGRs to include: ▪ Air quality assessment; ▪ Noise assessment; ▪ Traffic and transport; ▪ Biodiversity; ▪ Revegetation; ▪ Cumulative impacts; ▪ Social and economic; ▪ Community consultation; and ▪ Blackmans Flat.	Addressed in EIS in order of issues raised at Sections 9.6.2, 9.6.1, 9.6.10, 9.6.6, 9.6.7, 9.7, 9.6.5, and 9.6.9.

Agency	Date and type of consultation	Issues Raised	Responses to Issues Raised
Sydney Catchment Authority (SCA)	14 March 2012 Letter from SCA in response to Government Briefing Paper accompanying request for DGRs.	▪ Project will have adverse impact on water quality and quantity; ▪ Requests details of overlap between Deltas emplacement approval and Project implications; ▪ Groundwater study required; ▪ Detailed description of construction works; ▪ Details of remaining rehabilitation of Lamberts Gully; ▪ Water management plan; ▪ Aquatic ecology study; ▪ Groundwater and associated dependent aquatic ecosystems; ▪ Rehabilitation of watercourses; ▪ Determination of pollutant loads; ▪ Establish performance criteria; ▪ Modelling of surface, groundwater and cumulative impacts; ▪ Rehabilitation strategy; ▪ Monitoring program; and ▪ Council's waste depot.	Addressed in EIS at Sections 9.6.3, 9.6.4, 9.6.7 and 9.7.
Department of Primary Industries – Fisheries	30 October 2012 Letter responding to revised Government Briefing paper.	▪ DGRs considered satisfactory.	Noted

Agency	Date and type of consultation	Issues Raised	Responses to Issues Raised
Department of Primary Industries – NOW	30 October 2012 Letter responding to revised Government Briefing paper.	▪ Provision of an adequate and secure water supply for all activities for the life of the coal services area; ▪ Compliance with the rules in any relevant Water Sharing Plan and legislation; ▪ Baseline monitoring (minimum of fortnightly data sampling for at least two years prior to mine operations) of all surface water and groundwater sources and dependant ecosystems within and adjacent to the coal services area for calibration of models and development of trigger criteria; ▪ Predictive assessments of potential impacts to surface water and groundwater sources, basic landholder's rights to water, adjacent licensed water users and dependant ecosystems and monitoring to enable comparison with ongoing monitoring; ▪ Mitigation strategies to address impacts on surface water and groundwater sources and dependant ecosystems for the operational and post coal handling phases of the Project and final landform; and ▪ Expanded list of assessment requirements in Attachment A of the NOW response.	Addressed in EIS at Sections 9.6.3, 9.6.4, 9.6.7 and 9.7
Department of Primary Industries – Forests NSW	30 October 2012 Letter responding to revised Government Briefing paper.	▪ Statutory requirements regarding access arrangements with Forests NSW; ▪ Maps to show tenure information particularly the legal boundary with Forests NSW; ▪ Associated developments/infrastructure eg powerlines, roads and monitoring sites to be identified and such developments kept to a minimum and confined to existing infrastructure; ▪ Access to the State Forest by the public in a disciplined and limited manner to restrict the risk of misadventure, vandalism, arson and access to natural and heritage features; ▪ Any new Aboriginal or Non-Aboriginal heritage, flora, fauna or EEC sites identified must be communicated at the time to Forests NSW and other relevant authorities for recording; and ▪ Reminder of the conditions of use for the area under the occupation lease. Any conflict between occupation conditions and the development must be outlined.	Map to show tenure information is contained in Section of EIS, other matters addressed throughout the EIS.

Agency	Date and type of consultation	Issues Raised	Responses to Issues Raised
▪ Department of Planning and Infrastructure ▪ Environment Protection Authority ▪ Lithgow City Council ▪ Office of Environment and Heritage ▪ Sydney Catchment Authority ▪ Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) ▪ NSW Roads and Maritime ▪ NSW Railcorp ▪ NSW Health	A two day Government Briefing held on 17 and 18 October 2012 about a number of Centennial projects including Western Coal Services Project.	The key issues raised pertinent to the Project were: ▪ Assessment of cumulative impacts including existing operations and projects; ▪ Clarity required on the multiple consents covering the haul roads; ▪ Ensure social impacts are adequately assessed, community expectations have increased; ▪ Long term strategy required for the management of Wangcol Creek; ▪ Ensure that previous commitments are carried through, particularly specific rehabilitation commitments contained in the Lamberts Gully Open Cut Mine approval; ▪ Clearly identify EPBC Act issues and referral decisions; ▪ Groundwater seepage from the site; ▪ Water management issues, particularly the need to separate clean and dirty water circuits and improve water quality leaving the site and cumulative impacts with Delta Electricity; ▪ General noise and dust issues with particular emphasis on Blackmans Flat residents; ▪ Road safety issues surrounding the haul road link across the Castlereagh Highway; ▪ How does the Project fit into the overall regional water strategy; and ▪ The Project will be determined by the Planning and Assessment Commission.	Addressed, in order of issues raised in Sections 9.6, Sections 4.6 to 4.8, Section 6 and 9.5.7, 9.5.3 and 9.5.4, Section 5, 9.5.6, 9.5.3, 9.5.1, 9.5.2, and 9.5.10.
Delta Electricity	Ongoing and regular meetings	▪ Springvale Coal has an established and long standing working relationship with Delta Electricity. Regular meetings are held to discuss coal supply, property matters and transfers, water supply and project related matters. Delta is aware of the proposed upgrade to the Springvale Coal Services Site and conflicts with Delta's Lamberts South Ash Emplacement project. Springvale Coal is aware of Delta's need for future ash disposal capacity and is committed to working towards a satisfactory resolution to both parties.	Ongoing.

Agency	Date and type of consultation	Issues Raised	Responses to Issues Raised
Pine Dale Mine	On-going meetings	▪ Springvale Coal has an established and long standing working relationship with Pine Dale Mine, including an existing data sharing arrangement. ▪ Regular meetings are held to discuss the interactions between Pine Dale Mine and Centennial's western operations. These meetings will continue so as to provide a satisfactory resolution to both parties.	Ongoing.

6.5 Future Consultation

Springvale Coal is committed to developing effective engagement strategies with the community. This includes developing processes for seeking community feedback on Project development and refining engagement approaches where required.

The Project sits within a larger regional context for Centennial's Western Operations. As such, Springvale Coal will seek to consolidate the Community Consultative Committee for this Project with other Centennial Coal Community Consultative Committees in the region.

7.0 Planning Framework

7.1 Commonwealth Legislation

7.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The EPBC Act is administered by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC).

Under the EPBC Act, approval by the Environment Minister is required for proposed 'actions' that have the potential to significantly impact on Matters of National Environmental Significance (MNES) or the environment of Commonwealth land. MNES of potential relevance to the Project include Commonwealth listed threatened species and ecological communities, and migratory species.

An EPBC Act Protected Matters Search was undertaken within the SEWPaC on-line database (accessed 2012) to generate a list of those MNES, from within 10km of the site, which may have the potential to occur within the site. This data, combined with other local knowledge and records, was utilised to assess whether the type of activity proposed on the site will have, or is likely to have a significant impact upon a MNES, or on the environment of Commonwealth land.

The Project will not have a significant impact on MNES, as no MNES exist within the PAA. Whilst some listed threatened species and communities exist within a ten-kilometre radius, the nature of the Project means that there will be no significant impact to these listed threatened species or communities. As such, a referral will not be made for the Project. This is discussed further in **Table 9**.

Table 9 Matters of National Environmental Significance

MNES	Assessment
World Heritage Properties	Lands within the PAA are not World Heritage Properties. The Greater Blue Mountains Area of NSW (a World Heritage Property) is located approximately 22km to the east of the PAA. It is not expected that the Project will have a significant impact upon the Greater Blue Mountains Area of NSW.
National Heritage Places	None of the land parcels within the PAA are listed as a National Heritage Place. The Greater Blue Mountains Area of NSW (a National Heritage Place) is located approximately 22km to the east of the PAA. It is expected that the Project will not have a significant impact upon The Greater Blue Mountains Area of NSW.
Wetlands protected by international treaty (the Ramsar convention)	There are no wetlands protected by international treaty (the Ramsar convention) arising from the EPBC Act Protected Matters Report generated for an area within 10km of the PAA.
Great Barrier Reef Marine Park	The Project will not impact on the Great Barrier Reef Marine Park.
Commonwealth Marine Areas	There are no Commonwealth Marine Areas arising from the EPBC Act Protected Matters Report generated for an area within 10km of the PAA.
Nationally listed threatened species and ecological communities	A total of 29 threatened species and one ecological community listed under the EPBC Act have been recorded or have suitable habitat within a 10km radius of the PAA. These have been assessed in the Ecological Assessment in **Appendix 8** which concluded that the Project is unlikely to have a significant impact upon MNES.
Nationally listed migratory species	A total of 15 migratory species listed under the EPBC Act 1999 have been recorded or have suitable habitat within a 10km radius of the PAA. The Project is unlikely to substantially modify, destroy or isolate an area of important habitat, result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat, or seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species.

7.1.2 Native Title Act 1993

The *Native Title Act 1993* (NT Act) recognises that Aboriginal people can have rights and interests to land which derives from their traditional laws and customs. Native title rights can include rights to: live on the land, access the land for traditional purposes, protect important places and sites, collect food and medicinal resources from native plants, hunt and fish, teach traditional law and customs, and to have input into land use practices and development planning. Native title can be negotiated in three ways; through a Native Title Claim (applications and determinations), through an Indigenous Land Use Agreement (ILUA), or future act agreements.

An ILUA is an agreement between a native title group and other parties who use or manage the land and waters. The ILUA process allows for negotiation between indigenous groups and other parties over the use and management of land and water resources, as well as providing a means for coming to a formal agreement. ILUA are binding once they have been registered on the Native Title Tribunal's Register of ILUAs.

Land within the PAA is subject to an ILUA which was entered into on the 31 January 2003 by the Gundungurra Native Title Claim Group, the Gundungurra Tribal Council Aboriginal Corporation and Springvale Coal), Springvale Pty Ltd, Springvale SK Kores Pty Ltd, Coalex Pty Ltd, Centennial Angus Place Pty Ltd and Ivanhoe Coal Pty Ltd. As such, these Centennial companies are bound by the terms of the ILUA which are set out in the Master Deed. Aboriginal consultation will be carried out in accordance with the requirements of the ILUA.

7.2 NSW Legislation

7.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act sets the framework for the assessment and approval of development in NSW. Development is assessed and approved under either Part 4 or Part 5 of the Act, depending on the nature of the work and classification of the application.

SSD is assessed under Division 4.1 of Part 4 of the EP&A Act and includes development that is declared to be SSD by a SEPP or by order published in the Government Gazette.

SEPP (State and Regional Development) 2011 (State and Regional Development SEPP) identifies development which is SSD. Clause 8 of the State and Regional Development SEPP states that development is declared to be SSD if it is not permissible without development consent under an environmental planning instrument and is specified in Schedule 1 or 2.

The Project is identified under Clause 5(3) of Schedule 1 of the State and Regional Development SEPP, which includes:

> Development for the purpose of mining related works (including primary processing plants or facilities for storage, loading or transporting any mineral, ore or waste material) that:
>
> (a) is ancillary to or an extension of another SSD project, or
>
> (b) has a capital investment value of more than $30 million.

The Project is not permissible without development consent under an environmental planning instrument. The capital investment value for the Project is in excess of $30 million, and therefore Division 4.1 of Part 4 of the EP&A Act applies.

7.2.2 State Environmental Planning Policies

SEPPs are produced by the DPI to provide guidance on significant issues for NSW. A review of current SEPPs was undertaken and those relevant to this Project are addressed below.

7.2.2.1 State Environmental Planning Policy (State and Regional Development) 2011

SEPP (State and Regional Development) 2011 aims to identify development that is state significant development (SSD); aims to identify development that is state significant infrastructure; and aims to identify critical state significant infrastructure. It also confers functions on joint regional planning panels to determine development applications. As mentioned in Section 7.2.1 SEPP (State and Regional Development) 2011 applies to this Project. The Project is ancillary to other SSD projects, namely Neubeck (SSD 12_5598), Angus Place Colliery Extension (SSD 12_5602), and Springvale Coal Mine (SSD 12_5594), which are SSD as defined by the SEPP (State and Regional Development) 2011. Hence under SEPP (State and Regional Development) 2011 this Project is also a SSD. Additionally the capital cost of the Project is in excess of $30M which also makes the Project a SSD.

7.2.2.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the purposes of promoting the social and economic welfare of the State. Under Clause 7 of the SEPP, facilities for the processing or transportation of minerals or mineral bearing ores on certain land are permissible with development consent. The transport and processing of minerals, in this case coal, is permissible under the Mining SEPP because coal from the Neubeck Project (SSD 12_5598) will be processed on the Springvale Coal Services Site.

7.2.2.3 State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

The Project area is situated within the Sydney drinking water catchment. The SEPP requires that all development proposed within the Sydney drinking water catchment:

- Incorporate current recommended practices and performance standards endorsed or published by the SCA that relate to the protection of water quality; and
- Have a Neutral or Beneficial Effect (NorBE) on water quality.

In accordance with clause 10 of the SEPP, a consent authority must not grant consent to the carrying out of development under Part 4 of the EP&A Act on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a NorBE on water quality. This is discussed in detail in Section 9.5.3 relating to the Surface Water Impact and Water Balance Assessment that has been carried for the Project.

7.2.2.4 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

SEPP 33 requires that a preliminary hazard analysis be prepared for any development comprising potentially hazardous or offensive industry. The Project does not constitute potentially hazardous or offensive industry and therefore no further assessment under SEPP 33 is required.

7.2.2.5 State Environmental Planning Policy No. 44 – Koala Habitat Protection

SEPP 44 applies to land listed with Schedule 1 of the SEPP. The Greater Lithgow Local Government Area (LGA) (now Lithgow City LGA) is listed within Schedule 1 of SEPP 44 – 'Koala Habitat Protection'. Therefore SEPP 44 applies to the land.

Schedule 2 of the SEPP 44 lists 10 tree species that are considered indicators of 'Potential Koala Habitat'. The presence of any of the species listed on a site proposed for development triggers the requirement for an assessment for 'Potential Koala Habitat'. SEPP 44 defines potential Koala Habitat as areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

One Schedule 2 feed tree species *(Eucalyptus viminalis)* was recorded within the site at densities of less than 15% of the total number of trees, therefore the site does not constitute Potential Koala Habitat and no further provisions of this policy apply. No Koalas or evidence of Koalas were recorded during surveys. Given the nature of the Project and likelihood of impacts on habitat, it is considered unlikely that impacts to the Koala would result.

7.2.2.6 State Environmental Planning Policy No.55 – Remediation of Land

SEPP 55 regulates contamination by requiring all consent authorities to consider any contamination when determining a DA.

A Phase 1 ESA has been undertaken for the Springvale Coal Services Site and is contained in **Appendix 15**.

The ESA addresses the potential for soil, surface water and/or groundwater contamination to be present at the PAA from current and historical activities and assess the potential for contamination, if present, to be migrating from the PAA.

The assessment indicates that potential contamination at the Springvale Coal Services Site currently presents a low to moderate risk to human health and the environment. Uncontrolled exposure may cause a minor risk to workers and visitors. This can be managed through conventional occupational health and safety protocols.

Concentrations of potential contaminants at LDP006 and Wangcol Creek are at concentrations greater than the adopted site assessment criteria. This poses a risk to environmental receptors of Wangcol Creek. Further discussion on contamination matters is contained in Section 9.5.14 and **Appendix 15.** A Phase 2 ESA will be conducted in accordance with the schedule provided by Centennial to the NSW EPA, which states that the works for low risk sites will be conducted by February 2015.

The Kerosene Vale Stockpile Area has been the subject of previous contamination assessments with the latest being a Validation Report prepared in February 2007 by HLA – Envirosciences and its subsequent review by NSW DECC accredited Site Auditor Ross McFarland (Site Auditor No.9819). The Report validated the condition of the land at the site and demonstrates that a diesel spill that was reported to have taken place in a certain area of the site has been remediated.

There are no changes proposed to the physical dimension and location of the Springvale overland conveyor or the existing Angus Place to Mt Piper Power Station and Angus Place to Wallerawang Power Station Haul Roads. This infrastructure operates under an established EMS that has been developed in accordance with the Centennial EMS Framework. The EMS has been developed and implemented to ensure the effective management of environmental issues and compliance with all regulatory requirements.

7.2.3 Lithgow City Local Environmental Plan 1994

The *Lithgow City Local Environmental Plan 1994* (LC LEP 1994) is the principal planning instrument governing land use planning and development within the LGA. The Springvale Coal Services Site and the Kerosene Vale Coal Stockpile Area are located on land zoned Rural (General) 1(a) under the LC LEP 1994. The private haul roads and the overland conveyor system which also form part of the PAA are located on

land that are predominately zoned Rural (General) 1(a) with some small areas of land zoned Rural (Forestry) 1(f). It is noted that the residences of Blackmans Flat are located on land also zoned 1(a) Rural (General) and the OL conveyor in the vicinity of Lidsdale crosses the Castlereagh Highway and two minor roads that are unzoned.

One objective of the Rural (General) 1(a) zone is to protect, enhance and conserve valuable deposits of minerals, coal and extractive materials, by controlling the location of development for other purposes in order to ensure the efficient extraction of these deposits. Under the 1(a) Rural (General) zone, any development, except that permitted without consent or which is prohibited, is permissible with consent. Mining is not listed as prohibited or permitted without consent. However LC LEP 1994 adopts the majority of definitions within the Environmental Planning and Assessment Model Provisions 1980 (which continue to be in force for the purposes of the LC LEP 1994 via the *Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005 No 43*) including "mine" where a mine is defined as any place, open cut, shaft, tunnel, pit, drive, level or other excavation, drift, gutter, lead, vein, lode or reef whereon, wherein or whereby any operation is carried on for or in connection with the purpose of obtaining any metal or mineral by any mode or method and any place on which any product of the mine is stacked, stored, crushed or otherwise treated, but does not include a quarry. Therefore mining is permissible with consent in this zone.

LC LEP 1994 lists "mining" as a use permissible with consent and because of the adoption of the Environmental Planning and Assessment Model Provisions 1980 (which continue to be in force for the purposes of the LC LEP 1994 via the *Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005 No 43*), including the definition of "mine", mining is permissible in land zoned Rural (Forestry) 1(f). Whilst the land zoned Rural (Forestry) 1(f) is within the PAA for the Project, there are no activities proposed to be undertaken in this area, other than the continued use of the OL conveyor.

LC LEP 1994 also adopts clause 14 of Environmental Planning and Assessment Model Provisions 1980 (which continues to be in force for the purposes of the LC LEP 1994 via the *Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005 No 43*), relating to uses on public roads, which allows development for a purpose which may be carried out either with or without the consent of the consent authority on land adjoining that road. Land that is unzoned in the PAA adjoins land that is zoned Rural (General) 1(a) and Rural (Forestry) 1(f) which through the LC LEP 1994 are zones that permit the definition of "mine".

7.2.4 Draft Lithgow City Local Environmental Plan 2013

The Planning Proposal for Draft Lithgow Local Environmental Plan 2013 (Draft LC LEP 2013) commenced public exhibition on 26 June 2013. Once the finalised version of Draft LC LEP 2013 commences it will become the principal environmental planning instrument for the Lithgow LGA, repealing the current LC LEP 1994 and the current Rylstone LEP 1996.

Within the PAA Draft LC LEP 2013 rezones the areas zoned Rural (General) 1(a) to RU 1 Primary Production, areas zoned Rural (Forestry) 1(f) to RU 3 Forestry and the Castlereagh Highway to SP 2 Infrastructure. The land use table for the RU1 zone specifically lists "open cut mining" and "extractive industries" as activities permissible with consent however does not list "mining" and "underground mining", which are definitions in the Dictionary, as activities permissible with consent. The land use table for the RU 3 zone lists "roads" and "activities under the Forestry Act" as permissible uses and all others are prohibited.

Draft LC LEP 2013 also rezones Lot 42 DP 751636 which is owned by LCC and located within the Springvale Coal Services Site to SP 2 Infrastructure. Within the SP 2 Infrastructure zone roads are permitted without consent and purposes shown on the Land Zoning Map including any development that is ordinarily incidental or ancillary to development for that purpose is permitted with consent.

Notwithstanding the potential anomalies in permissibility's of various uses between the zones contained within LC LEP 1994 and Draft LC LEP 2013 it is noted that Clause 1.8 A (Savings provision relating to development applications [local]) within the Draft LC LEP 2013 states the following:

"If a development application has been made before the commencement of this Plan in relation to land to which this Plan applies and the application has not been finally determined before that commencement, the application must be determined as if this Plan had not commenced."

This Project and development application has been made and will be determined before the commencement of Draft LC LEP 2013.

7.3 Other NSW Legislation

Other legislation relevant to the Project is discussed in **Table 10**.

Table 10 Other State Legislative Requirements Applicable to the Project

Legislation	Requirements	Relevance to the Project
Mining Act 1992	The objects of the *Mining Act 1992* are to facilitate the discovery and development of mineral resources in NSW while recognising the need to encourage ESD. Under the Act, it is an offence to mine any mineral without the appropriate authorisation. Part 6 of the Act provides that any two or more leases may be consolidated if held by the same person and relate to contiguous parcels of land.	No new mining titles would be required for the Project. The access, processing and distribution of coal from Springvale Coal Mine, Angus Place Colliery, Lamberts Gully Open Cut and the Springvale Coal Services Site would be integrated into one approval as part of the Project.
Protection of the Environment Operations Act 1997 (POEOA Act)	The POEO Act regulates waste generation and disposal, and water, air and noise pollution in NSW. Under the POEO Act, an EPL is required for any premises at which a scheduled activity, as defined in Schedule 1 of the Act, is conducted. Schedule 1 includes 'Coal works, meaning any activity (other than coke production) that involves storing, loading or handling coal (whether at any coal loader, conveyor, Washery or reject dump or elsewhere) at an existing coal mine or on a separate coal industry site [where] it has a capacity to handle more than 500 tonnes per day of coal, or it has capacity to store more than 5,000 tonnes of coal (not including within a closed container or building)'.	EPL 3607 held by Springvale Coal Mine covers the mining operations, surface facilities, overland conveyors and the Springvale Coal Services Site. EPL 467 held by Angus Place Colliery covers the mining operation, surface facilities and road haulage of coal. A separate EPL covering the Project, inclusive of all coal transport infrastructure and operations will be applied for following approval of the Project. This will include incorporating the existing LDP 006, 007 and 003 (currently on Angus Place EPL)
Water Management Act 2000 (WMA) and *Water Act 1912*	The WMA regulates water sources in NSW for all areas in which a water sharing plan has commenced. The Greater Metropolitan Unregulated River Water Sources Water Sharing Plan commenced on 1 July 2011 and covers the Project site. Under the WMA, it is an offence to take water without a water access licence. The Water Act 1912 regulates the use of water for areas in which a water sharing plan has not yet commenced and therefore does not apply to the Project site.	The Project would involve modification to the water supply and reuse requirements at the site. Springvale Coal holds a number of existing licences under Part 5 of the *Water Act 1912* for mine dewatering and monitoring. A water access licence under the WMA will be required for the Project. The Project will consolidate the existing licences under the *Water Act 1912* and incorporate changes to the water use requirements from the Project. The Project will seek a water licence for the transfer of mine water from the Springvale Mine to the Springvale Coal Services Site and the Lidsdale Siding, along the existing overland conveyor.
National Parks and Wildlife Act 1974 (NPW Act)	The NPW Act provides for the establishment, care, control and management of National Parks, historic sites, nature reserves, State conservation areas, Aboriginal areas and State game reserves. Under the NPW Act, it is an offence to harm Aboriginal	The requirement for an AHIP under section 90 of the NPW Act does not apply to approved Projects under Division 4.1 of Part 4 of the EP&A Act and therefore would not apply to the Project once approved. A

Legislation	Requirements	Relevance to the Project
	objects or places unless authorised by an Aboriginal Heritage Impact Permit (AHIP) issued under section 90 of the NPW Act.	CHA was prepared for the Project and is discussed in section 9.5.9.
Heritage Act 1977	The purpose of the Heritage Act 1977 is to protect and conserve non-Indigenous cultural heritage items, sites and relics. Under the Act, approval from the Heritage Council is required for certain activities concerning items or places listed on the State Heritage Register (SHR), or for which an interim heritage order (other than those made by a local council) applies.	No items or places listed on the SHR or which have an interim heritage order were identified in the PAA during the CHA, refer to Section 9.5.9.
Threatened Species Conservation Act 1995 (TSC Act)	The TSC Act provides for the conservation of threatened biodiversity in NSW. Under the TSC Act, a licence is required to harm or pick threatened species, populations or ecological communities or damage habitat. A species impact statement is required where an action is likely to significantly affect threatened species, populations or ecological communities or their habitats.	An Ecological Assessment was prepared for the Project and is discussed in Section 9.5.6. The assessment indicates that the Project is unlikely to significantly impact on a threatened species, population or ecological community or their habitat. An Aquatic Ecology Assessment was also prepared for the Project and is discussed in Section 9.5.7. The Assessment notes that the proposed upgrade of the water management system aims at improved separation of Lamberts (and Huon) Gully upper catchment runoff water from the Springvale Coal Services Site water management system and has the potential to provide an improvement for aquatic biodiversity in Wangcol Creek. Therefore a species impact statement is not required.
Roads Act 1993	Under section 138 of the Roads Act 1993, consent is required to erect a structure or carry out work in, on or over a public road.	The Project involves crossing of the Castlereagh Highway which would require approval under section 138 of the *Roads Act 1993*. Consultation with the RMS is described in Section 9.5.10.
Contaminated Land Management Act 2008 (CLM Act)	The CLM Act establishes a process for the investigation and remediation of contaminated land.	A Phase 1 Contamination Assessment was prepared for the Project and is discussed in Section 9.5.14.

8.0 Project Alternatives

8.1 Analysis of Alternatives

8.1.1 Alternatives Considered

Springvale Coal has considered a number of alternative infrastructure solutions to achieve the Project objectives.

8.1.1.1 Coal Haulage Using Public Roads

This has been considered because Springvale Coal does not own the Angus Place to Mt Piper Haul Road, therefore for commercial certainty needed to consider use of public roads. There is a cost associated with the construction of a link road that would not exist if opportunity to haul from Mt Piper Power Station to Springvale Coal Services Site was available.

Use of public roads was not pursued as an option because:

- Community engagement identified cumulative effects as a significant concern;
- Current practice is to use private haul roads; and
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007 requires a number of considerations that would preclude the use of public roads.

8.1.1.2 Construction of Overland Conveyor

Angus Place Colliery holds several development consents. The original Development Consent was granted by the then Blaxland Shire Council as a result of an EIS prepared in 1975 by the then Mine Development Department of the Electricity Commission of NSW and it is noted that the Development Consent included the construction and use of an overland coal conveyor from Angus Place Colliery to Wallerawang Power Station.

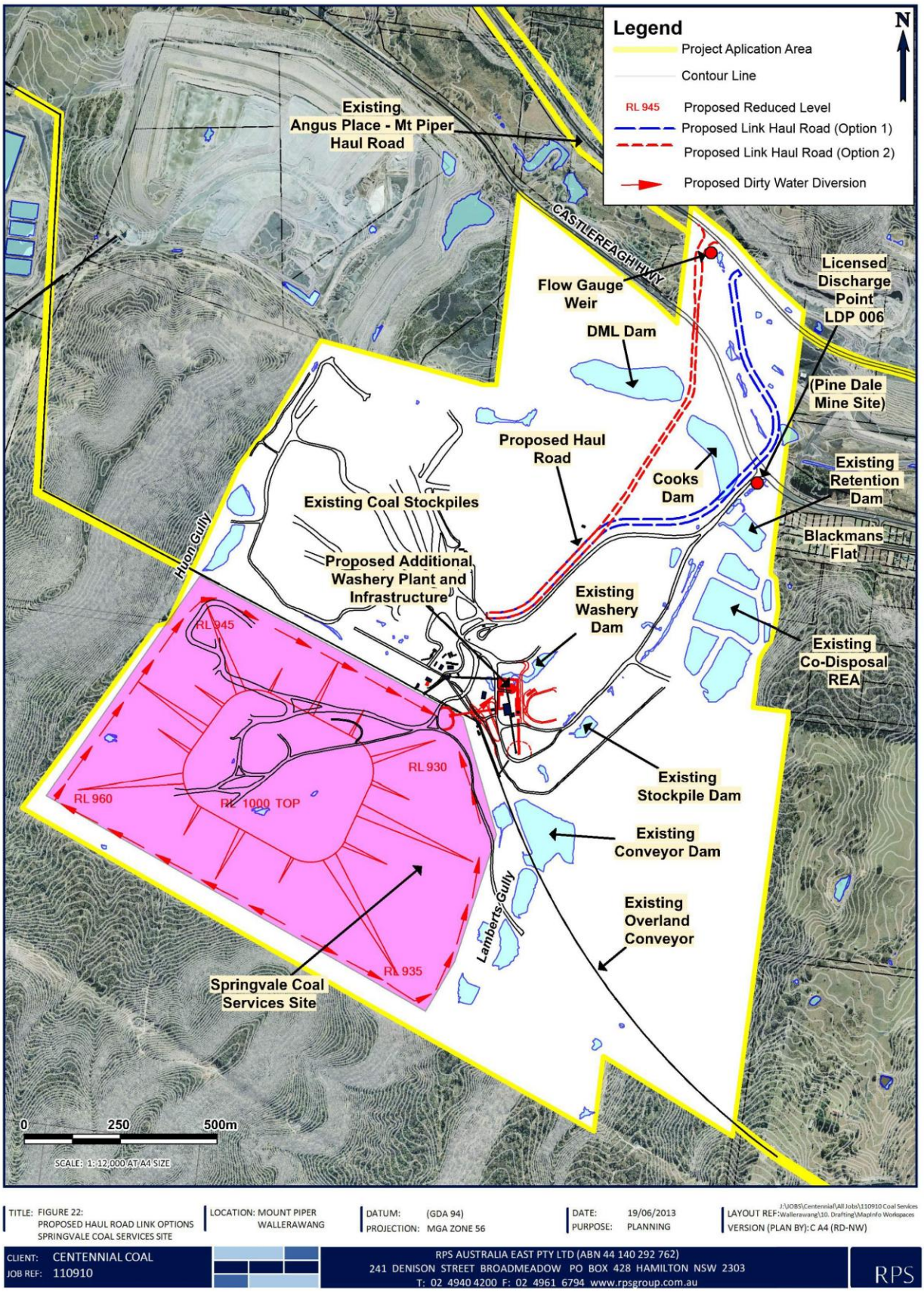
In 2006 the EA for the Angus Place extension of longwall mining operations noted that the approved overland conveyor to Wallerawang Power Station was not constructed but may be constructed in the future when economic circumstances would justify it. Also within the EA was consideration to the construction of a new overland conveyor, instead of a haul road link, from the existing Angus Place Colliery to Mt Piper Haul Road across the Castlereagh Highway to the Springvale Coal Services Site. The EA noted that the option would mean double handling of coal from truck to conveyor with associated higher economic costs and additional environmental impacts of noise and dust in particular. The higher overall economic costs and impacts of noise and dust at the truck to conveyor transfer point are still relevant today and preclude the pursuant of additional overland conveyors.

8.1.1.3 Proposed New Link Haul Road Options

Two options for the proposed Link Haul Road from the existing Angus Place to Mt Piper Power Station haul road to the Springvale Coal Services Site were considered. Locations of the proposed Link Haul Road options, (Option 1– eastern alignment, and Option 2 – western alignment) are illustrated in **Figure 22**.

Option 1 is located approximately 140 metres west of Blackmans Flat and was considered the ‘worst case’ particularly in respect of noise impacts on residents in the Blackmans Flat which will be significant. This option crosses the Castlereagh Highway immediately adjacent to the existing access road which provides entry to the Springvale Coal Services Site.

Figure 22 Proposed Link Haul Road Options Plan



Option 2 is located approximately 400 metres west of Blackmans Flat and is the more direct route between the Springvale Coal Services Site and the existing Angus Place to Mt Piper Power Station Haul Road. Under this option, the proposed Link Haul Road will pass between two existing dams (being DML and Cooks Dams as shown in **Figure 22**) which need to be retained as part of the surface water management strategy for the Project.

8.1.1.4 Reject Emplacement Options

Springvale Coal has investigated several alternative options for reject emplacement including location, design and alternative uses. Although alternative uses has been, and will continue to be fully explored, a conservative approach has been adopted by assuming that all reject produced will require disposal.

The initial design options included several smaller emplacements located around the Springvale Coal Services Site. These included the expansion of the existing Co-disposal REA located near the site entrance and the valley leading up to the existing Washery. These options were discounted on the basis of potential noise and dust issues on residents in Blackmans Flat as well as visual impacts from the Castlereagh Highway. A single large REA located south of the overland conveyor on land previously disturbed by open cut operations proved the best option from both an environmental and operational perspective. The chosen site allows the reject to be conveyed from the Washery to a new rejects bin from which the rejects can be transported a short distance to the final emplacement site. Other options would require trucking rejects from the Washery to various smaller emplacements around the site which in turn leads to greater noise and dust impacts and operational costs.

Alternative uses of reject will however continue to be pursued. Currently, Western Matrix are trialling the use of coarse washery reject and power station fly ash to produce a marketable road base. Springvale Coal has also blended some reject into their product stream depending on product specifications.

8.1.2 Business as Usual (BAU) Option

In the event that the Project does not proceed, the existing operations will continue to operate. Failure of the Project to proceed will significantly reduce the flexibility available to Centennial in the management and operation of the Angus Place Colliery, Springvale Coal Mine and other Centennial operations in the western coalfields.

In this scenario, Angus Place Colliery will continue to have limited opportunities for the sale of coal to a captive domestic market. Unfortunately, this outcome would seriously affect current and future economic viability, employment opportunities and the local economy. The Project as proposed includes market flexibility to avoid this outcome.

8.1.3 Need for the Project

The Project has been developed to provide Springvale Coal with market flexibility to respond to changing market trends.

It provides both security for the operations of Angus Place Colliery and Springvale Coal Mine, and an opportunity for future projects in the local area. This is achieved by the upgrading of existing infrastructure to provide additional coal washing and waste handling capacity and the flexibility to access both the domestic and export markets.

The continued utilisation and upgrading of existing infrastructure for the transport, processing and loading of coal will result in less overall community and environmental impact than would result from the development of a new site or sites. The linkage of the Springvale Coal Services Site to the existing Lidsdale Siding (with recent approval for upgrading as per Project Approval 08_0223) creates synergies for coal operations and

reduces the potential impacts on the community through the utilisation of existing infrastructure and the upgrading of facilities that currently have significant environmental impacts.

Community benefits of private road haulage are maintained with the proposed Link Haul Road from the existing Mt Piper Haul Road to the Springvale Coal Services Site.

The Project provides for the integration of the coal transport and handling portions of the existing Angus Place Colliery and Springvale Coal Mine operations, providing for efficiencies and benefits in the management and regulation of coal handling and processing activities.

These benefits provide an opportunity to integrate environmental conditions relevant to coal handling and logistics into one consolidated approval for those activities.

9.0 Environmental Assessment

9.1 Environmental Risk Assessment

9.1.1 Identification of Environmental Issues

Springvale Coal uses a risk assessment process to identify environmental, safety and business risks to all its operations. This process involves identifying existing controls and recommending any additional controls for all identified risks. The focus is on the inter-relationship between people, machinery, methods of work, the environment and the community.

Springvale Coal has an Environmental Policy that clearly states that it values its role in minimising environmental impacts and aims to manage its businesses to achieve balanced environmental, economic and social impacts. The policy states Springvale Coal's commitment to minimising environmental impacts and to continued improvement in environmental management and performance. Key Project-related issues warranting detailed assessment have been identified through:

- The existing environmental context of the PAA and surrounding locality;
- The legislative framework applicable to the Project;
- An environmental and stakeholder risk assessment; and
- The outcomes of engagement activities with the community, government agencies and other relevant stakeholders.

The outcomes of the environmental and stakeholder risk assessment including the issues identified for further detailed assessment are discussed below.

9.1.2 Preliminary Broad-Brush Risk Assessment

A preliminary BBRA for the Project was conducted on 5 April 2011. The BBRA included representatives from Springvale Coal Services, Springvale Coal Mine, Angus Place Colliery, environmental personnel from each operation, design consultants, Springvale Coal management and an external facilitator. The primary objective of the BBRA was to identify the activities, aspects and possible impacts associated with the Project. The BBRA was then followed up by additional data review and data gap analysis to determine the scope of any required environmental studies. The key environmental risks identified and specifically assessed included:

- Noise impacts on nearby communities;
- Dust impacts on nearby communities;
- Surface water management;
- Groundwater;
- Ecological implications;
- Visual impacts of the private haul road crossing the Castlereagh Highway; and
- Community issues.

9.1.3 Pre-Project Risk Assessment

In addition to the BBRA, an environmental and stakeholder risk assessment was conducted on 24 November 2011 with the aim of:

- Identifying those issues relating to the Project that represent the greatest risk to the local environment and community; and
- Assisting in setting the level of assessment required to address each identified risk within the environmental impact assessment.

This risk assessment was undertaken by key personnel from Springvale Coal Services, the Western Coal Services Upgrade Project Team, RPS and International Environmental Consultants.

The risks that were specifically assessed in the risk assessment were:

- Noise;
- Air quality;
- Surface water;
- Groundwater;
- Social Impacts;
- Terrestrial and Aquatic Ecology;
- Visual Amenity;
- Aboriginal Cultural Heritage;
- European Cultural Heritage;
- Traffic
- Agriculture;
- Greenhouse Gas (GHG);
- Planning and compliance issues;
- Rehabilitation; and
- Waste.

Once these risks were identified, assessment was undertaken with the mitigation measures and management strategies already in place.

Where the risks were considered unacceptable, or a knowledge gap was identified in the information available, specialist consultants have been engaged to undertake further assessments and to present additional mitigation measures that may be required.

The environmental and stakeholder risk assessment was undertaken using Springvale Coal's Risk Assessment Standard where identified risks are ranked in accordance with **Table 11**.

Table 11 Risk Management in accordance with the Springvale Coal Risk Standard

Risk Category	Consequences	Generic Management Actions
Extreme	Major offsite impact.	Immediate intervention required from Senior Management to eliminate or reduce this risk.
High	Minor offsite impact or major onsite impact.	Imperative to eliminate or reduce risk to lower level by the introduction of control measures, management planning required at senior level.
Significant	Moderate onsite impact.	Corrective action required, senior management attention needed to eliminate or reduce risk.
Moderate	Minor onsite impact.	Corrective action to be determined, management responsibility must be specified.
Low	Negligible impact.	Monitor and manage by corrective action where practicable.

A summary of the results of the environmental and stakeholder risk assessment, follow-up work undertaken and current status is provided in **Table 12**.

Table 12 Priority Risk Categories for Management and Current Status

Risk Category	Highest risk category with existing controls	Proposed additional controls	Status
Noise	High	Design to include noise mitigation systems to meet required noise goals at the nearest residential receptors.	Noise consultant engaged to work with design consultant to investigate noise mitigation strategies. A Noise and Vibration Impact Assessment has been completed, is discussed in Section 9.5.1 of the EIS and is provided in **Appendix 2**.
Air Quality	Moderate	Existing dust controls operating on coal handling infrastructure, stockpiles and overall site will be expanded to include additional infrastructure.	An Air Quality consultant has been engaged and an Air Quality Impact Assessment has been completed. The Assessment is discussed in Section 9.5.2 of the EIS and is provided in **Appendix 3**
Surface water	Moderate	Existing water management plan will be expanded to include additional REAs, expanded infrastructure and haul road.	A Surface Water consultant has been engaged. Additional water management and pollution control studies have commenced as part of the design process. Assessment undertaken. The Assessment is discussed in Section 9.5.3 of the EIS and is provided in **Appendix 4.**
Groundwater	Moderate	No additional controls proposed.	Groundwater consultant engaged. Assessment undertaken. The Assessment is discussed in Section 9.5.4 of the EIS and is provided in **Appendix 6.**

Risk Category	Highest risk category with existing controls	Proposed additional controls	Status
Social Impacts	Moderate	Current Stakeholder Engagement Plan to be expanded to include required approval process.	Stakeholder Engagement Plan being implemented. Community consultation undertaken. A SIA is discussed in Section 9.5.5 of the EIS and is provided in **Appendix 7**.
Terrestrial and Aquatic Ecology	Moderate	Crossing of Wangcol Creek requires additional investigations with some clearing of previously rehabilitated land but remaining site footprint is highly disturbed by existing mining operations.	Terrestrial ecology consultant and aquatic ecology consultant engaged. Assessments undertaken. These Assessments are discussed in Sections 9.6.6, 9.5.7 of the EIS and provided in **Appendix 8** and **Appendix 9**.
Visual Amenity	Moderate	Specialist visual assessment required.	Consultant engaged. Assessment undertaken. The Assessment is discussed in Section 9.5.8 of the EIS and is provided in **Appendix 10.**
Aboriginal Cultural Heritage	Low	Development footprint already highly disturbed. Specialist study required for due diligence.	Archaeologist/Heritage consultant commissioned. Assessment undertaken. The Assessment is discussed in Section 9.5.9 of the EIS and is provided in **Appendix 11.**
European Cultural Heritage	Low	Development footprint already highly disturbed. Specialist study required.	Archaeologist/Heritage consultant commissioned. Assessment undertaken. The Assessment is discussed in Section 9.5.9 of the EIS and is provided in **Appendix 11.**
Traffic	Low	Avoidance of coal trucks on public roads, Project to incorporate use of private haul roads. Transport study to include construction and employee traffic.	Traffic consultant commissioned. Assessment undertaken. The Assessment is discussed in Section 9.5.10 of the EIS and is provided in **Appendix 12.**
Agriculture	Low	No controls required, existing land heavily disturbed by mining activities with no agricultural capability.	Soils, land resources and agricultural consultant commissioned. Assessment undertaken. The Assessment is discussed in Section 9.5.11 of the EIS and is provided in **Appendix 13.**
Greenhouse Gas	Low	No controls required.	An Air Quality consultant has been engaged and a GHG Assessment (GHGA) has been completed. The Assessment is discussed in Section 9.5.2 of the EIS and is provided in **Appendix 3.**
Planning and Compliance Issues	Low	No controls required	An assessment of Planning and Compliance Issues is contained in Section 8 and Sections 3 and 4 respectively of the EIS.

Risk Category	Highest risk category with existing controls	Proposed additional controls	Status
Rehabilitation	Low	Current rehabilitation plan to be updated to accommodate new infrastructure, REA development and loss of previously rehabilitated land.	Initial planning work commenced including design of REAs and new infrastructure activities. Mine Closure planning commenced. Mine Rehabilitation is discussed in Chapter 5 of the EIS.
Waste	Low	No controls required, current waste management procedures will be followed.	Waste Management issues are discussed in Section 9.5.16 of the EIS.

9.2 Environmental Impact Assessment Team

The Environmental Assessment Team is identified in **Table 13** below.

Table 13 Environmental Impact Assessment Team

Role	Company
Proponent	Springvale Coal
EIS Project Management	RPS
Terrestrial Ecology	RPS
Aquatic Ecology	Marine Pollution Control
Heritage	RPS
Traffic and Transport	Barnsons
Air Quality	Pacific Environment
Greenhouse Gas	Pacific Environment
Noise and Vibration	SLR
Groundwater	RPS Aquaterra
Surface Water	RPS Aquaterra
Soils, Land Resources and Agriculture	GSSE
Contamination	AECOM
Social	James Marshall and Co
Economic	AIGIS Group
Visual	RPS
Hazard and Risk	IEC
Waste	IEC
Cumulative Effects	RPS with input from specialist assessors
Rehabilitation	IEC

9.3 Addressing the DGRs

The DGRs were issued on 6 November 2102. The key issues and reference to where they are addressed within this EIS are set out in **Table 14** below. Detailed responses to the matters raised are provided in the specialist assessment reports that are appended.

Table 14 How the DGRs Have Been Addressed

Director General's Requirements	Reference within EIS
General Requirements	
The Environment Impact Statement (EIS) for the development must meet the form and content requirements in Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.*	No specific reference required – EIS has been prepared in accordance with *Environmental Planning and Assessment Regulation 2000.*
In addition, the EIS must include a detailed description of the development, including: ▪ Need for the proposed development; ▪ Likely staging of the development – including construction, operational stage/s and rehabilitation; ▪ Likely interactions between the development and any approved and proposed mining operations, including detailed assessments of any required modifications to the approvals for these operations; ▪ Likely interactions with other approved developments/projects at the site; and ▪ Plans of any proposed building works.	Details provided in Sections 2,3 and 4 of the EIS
Consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments.	Details provided in Section 7
A risk assessment of potential environmental impacts of the development, identifying the key issues for further assessment.	Details provided in Section 9.1

Director General's Requirements	Reference within EIS
A detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: ▪ A description of the existing environment, using sufficient baseline data; ▪ An assessment of the potential impacts of all stages of the development taking into consideration relevant guidelines, policies, plans and statutes; ▪ A description of the measures that would be implemented to avoid, minimise and, if necessary, offset the potential impacts of the development, including Projects for adaptive management and/or contingency plans to manage any significant risk to the environment; ▪ An assessment of the potential cumulative impacts of the Project operating, in this regard, you are required to include a detailed assessment in the EIS of the potential cumulative impacts of the Project operating in conjunction with any existing, approved and/or proposed coal mining development and power generation in the vicinity of the site, and to carry out a suitable sensitivity analysis of this assessment; and ▪ A consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS.	Details provided in Sections 9, 10 and 11
The EIS must be accompanied by a report from a qualified quantity surveyor providing: ▪ A detailed calculation of the capital investment value (as defined in clause 3 of the *Environmental Planning and Assessment Regulation 2000)* of the Project, including details of all the assumptions and components from which the CIV calculation is derived; ▪ A close estimate of the jobs that will be created by the development during the construction and operational phases of the development; and ▪ Certification that the information provided is accurate at the date of preparation.	Quantity Surveyor report has been prepared and will accompany this EIS
Key Issues	
The EIS must address the following specific issues:	
Land Use Planning – including a clear description of: ▪ All approved and proposed developments for the site, the parties responsible for these developments for the site, the parties responsible for these developments and the potential interactions and/or conflicts of the approvals and consents for these developments; and ▪ How any identified conflicts have been, or are proposed to be, resolved;	Assessment undertaken – refer to Sections 3 and 4
Land Resources – including a detailed assessment of impacts to: ▪ Soils and land capability (including salinisation and land contamination); ▪ Landforms and topography; and ▪ Land-uses, including forestry and agriculture.	Assessment undertaken – refer to Sections 2.4 and 2.5, and Section 9.5.11
Water Resources – including: ▪ Detailed assessment of potential impacts on the quality and quantity of existing surface water and ground water resources in accordance with the NSW Aquifer Interference Policy, including; ▪ Impacts on affected licenced water users and basic landholder rights; ▪ Impacts on riparian, ecological, geo-morphological and hydrological values of watercourses, including Groundwater Dependant Ecosystems (GDE) and environmental flows; ▪ A clear description of the interactions between surface and ground water resources on the site, including water within underground mine voids and pathways to water discharges from the site; ▪ Whether the development can operate to achieve a NorBE on water quality in the drinking water catchment, consistent with the provisions of *SEPP (Sydney Drinking Water Catchment) 2011;* ▪ A detailed site water balance, including a description of site water demands, water disposal methods (inclusive of volume and frequency of any water discharges), water supply infrastructure and water storage structures; ▪ Identification of any licencing requirements including existing or future Environmental	Assessment undertaken – refer to Sections 9.5.3, 9.5.4 and 9.5.7

Director General's Requirements	Reference within EIS
Protection Licences (EPLs) or PRPs and approvals under the *Water Act 1912* and/or *Water Management Act 2000;* ▪ Demonstration that water for the construction and operation of the development can be obtained from an appropriately authorised and reliable supply in accordance with the operating rules of any relevant Water Sharing Plan (WSP); ▪ A description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant WSP or water source embargo; and ▪ A detailed description of the proposed water management system (including sewerage), water monitoring program and all other proposed measures to mitigate surface water and ground water impacts.	
Biodiversity – including: ▪ Measures that would be taken to avoid, reduce or mitigate impacts on biodiversity; ▪ Accurate estimates of proposed vegetation clearing; ▪ A detailed assessment of potential impacts of the development on any; ▪ Terrestrial or aquatic threatened species or populations and their habitats, endangered ecological communities and GDAs; ▪ Regionally significant remnant vegetation, or vegetation corridors; and ▪ An offset strategy to ensure the development maintains or improves the terrestrial and aquatic biodiversity values of the region in the medium to long term, having regard to any provisions for biodiversity enhancement under existing consents or approvals for the site.	Assessment undertaken – refer to Sections 9.5.6 and 9.5.7.
Heritage – including: ▪ An Aboriginal culture heritage assessment (including both cultural and archaeological significance) which must: ▪ Demonstrate effective consultation with the Aboriginal community in determining and assessing impacts, and developing and selecting mitigation options and measures; ▪ Outline any proposed impact mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures); ▪ A historic heritage assessment (including archaeology) which must: ▪ Include a statement of heritage impact (including significance assessment) for any State significant or locally significant heritage items; and, ▪ Outline any proposed mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures).	Assessment undertaken – refer to Section 9.5.9.
Air Quality – including a quantitative assessment of potential: ▪ Construction and operational impacts, with a particular focus on dust emissions including PM 2.5 and PM 10 emissions and dust generation from coal transport; ▪ Reasonable and feasible mitigation measures to minimise dust emissions, including evidence that there are no such other available measures; and ▪ Monitoring and best practice management measures, in particular real-time air quality monitoring.	Assessment undertaken – refer to Section 9.5.2.
Greenhouse Gases – including: ▪ A quantitative assessment of potential Scope 1, 2 and 3 GHG emissions; ▪ A qualitative assessment of the potential impacts of these emissions on the environment; and ▪ An assessment of reasonable and feasible measures to minimise GHG emissions and ensure energy efficiency.	Assessment undertaken – refer to Section 9.5.12.
Noise – including a quantitative assessment of potential: ▪ Construction, operational (including coal and reject truck haulage movements on the site) and off-site transport noise impacts, particularly for residents of Blackmans Flat; ▪ Reasonable and feasible mitigation measures, including evidence that there are no such measures available other than those proposed; and ▪ Monitoring and management measures, in particular real-time and attended noise monitoring.	Assessment undertaken – refer to Section 9.5.1.

Director General's Requirements	Reference within EIS
Traffic and Transport – including: ▪ A detailed economic justification of transporting coal on public roads, including assessment of the costs and benefits of alternative transport methods; ▪ Consideration of alternative locations for the proposed Link Haul Road bridge crossing the Castlereagh Highway, and the impacts of each alternative for traffic on the Highway and noise and dust impacts for residents of Blackmans Flat; ▪ An assessment of potential traffic impacts on the capacity, efficiency and safety of the road network; and ▪ A description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area over the life of the development.	Assessment undertaken – refer to Section 9.5.10.
Visual – including: ▪ A detailed assessment of the changing landforms on site during the various stages of the development; ▪ Potential visual impact of the development on private landowners in the surrounding area as well as from key vantage points in the public domain; and ▪ A detailed description of the measures that would be implemented to minimise the visual impacts of the development.	Assessment undertaken – refer to Section 9.5.8.
Waste – including: ▪ Accurate estimates the quantity and nature of the potential waste streams of the development, including tailings and coarse reject; ▪ A tailings and coarse reject disposal strategy, including contingency tailings disposal plans in the alternative to the proposed belt press dewatering facility; and ▪ A description of measures that would be implemented to minimise production of other waste, and ensure that the waste is appropriately managed.	Assessment undertaken – refer to Section 5 and 9.5.16.
Hazards – paying particular attention to public safety, including bushfires.	Assessment undertaken – refer to Section 9.5.15.
Social and Economic – including an assessment of the: ▪ Potential direct and indirect economic benefits of the development for local and regional communities and the State; ▪ Potential impacts on local and regional communities, including: ▪ Any increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services); ▪ Impacts on social amenity, particularly impacts on residents of Blackmans Flat and other nearby landowners and residents; ▪ A detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the Project, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanism; and ▪ A detailed assessment of the costs and benefits of the development as a whole, and whether it would result in a net benefit for the NSW community.	Assessment undertaken – refer to Section 9.5.5 and 9.5.13.
Rehabilitation – including the proposed rehabilitation strategy for the site, having regard to the key principals in *Strategic Framework for Mine Closure,* including: ▪ Rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria; ▪ Nominated final land use, having regard to any relevant strategic land use planning or resource management plans or policies: and ▪ The potential for integrating this strategy with any other rehabilitation and/or offset strategies in the region.	Assessment undertaken – refer to Section 5.
Plans and Documents	
The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the *Environmental Planning and Assessment Regulation 2000.* These documents should be included as part of the EIS rather than as separate documents.	Plans provided in accordance with the Environmental Planning and Assessment Regulation 2000

Director General's Requirements	Reference within EIS
Consultation	
During the preparation of the EIS, you must consult with relevant local, State and Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with the: ▪ Commonwealth Department of Sustainability, Water, Population and Communities; ▪ Office of Environment and Heritage (including Heritage Branch); ▪ Environment Protection Authority; ▪ Division of Resources and Energy within the DTIRIS; ▪ Department of Primary Industries (including the NOW, Forestry NSW, NSW Agriculture, Fisheries NSW and Catchments and Lands (Crown Lands Division); ▪ Transport for NSW (including the Centre for Transport Planning, and RMS); ▪ NSW Health; ▪ Sydney Catchment Authority; ▪ Lithgow City Council ▪ Delta Electricity; and ▪ Relevant Aboriginal stakeholders. The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, justification should be provided.	Results of Consultation contained in Section 6
Further consultation after 2 years.	
If you do not lodge a DA or EIS for the development within 2 years of the issue date of these DGRs, you must consult further with the Director-General in relation to the lodgement requirements.	Noted.
References	
The assessment of the key issues listed above must take into account relevant guidelines, policies and plans as identified.	Taken into account as appropriate.

9.4 General Assessment Methodology

The specialist assessments that are appended to this EIS form the basis of the assessment set out below. The environmental impacts during construction, operation and rehabilitation are identified as well as avoidance, mitigation and management measures.

The specific assessment methodologies adopted for each of the environmental disciplines relevant to this EIS are set out in the specialist reports that are appended. These may include reference to a study area that generally comprises a larger area, or in some cases smaller than the PAA itself to enable the identification of impacts. These study areas are defined in the relevant specialist assessment and, if different to the PAA, are described in this section.

9.5 Key Environmental Issues

This section provides the environmental impact assessment of the Project as described in Section 4 – Project Description of the EIS. The process has involved the undertaking of a number of specialist assessments. The consultants comprising the environmental impact assessment team are identified in Section 9.2. The assessment addresses the DGRs as identified in Section 9.3. A description of the general environmental impact assessment methodology is provided in Section 9.4. Section 9.5 provides a detailed description of the existing situation, environmental impacts during construction, operation and rehabilitation, mitigation measures and any residual impacts for the following:

- Noise;
- Air Quality;
- Surface Water;
- Geomorphology;
- Groundwater;
- Social;
- Terrestrial ecology;
- Aquatic ecology;
- Visual;
- Cultural Heritage;
- Traffic;
- Agriculture;
- Greenhouse Gas;
- Economics;
- Contamination;
- Hazards; and
- Waste.

This is followed by the cumulative effects assessment of the Project, together with other existing or approved Projects in the area with potential for such effects.

9.5.1 Noise and Vibration

9.5.1.1 Introduction

The BBRA for the Project considered that the management of the noise impacts was a high risk and that the design would include noise mitigation systems to meet the required noise goals at the nearest residential receptors.

SLR Consulting were engaged to undertake a Noise and Vibration Impact Assessment for the Project. A copy of the Assessment is contained within **Appendix 2**. The Assessment has been prepared with reference to Australian Standards (AS) 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in accordance with the New South Wales (NSW) Environment Protection Authority (EPA) *NSW Industrial Noise Policy* (INP), *Environmental Noise Control Manual* (ENCM), *NSW Road Noise Policy* (RNP) and *NSW Interim Construction Noise Guideline* (ICNG).

Other relevant criteria used in the noise impact assessment for the Project included sleep disturbance noise goals and the construction noise goals, which were developed with reference to the relevant guidelines mentioned above. The potential impacts from the Project were also assessed against these criteria, and are discussed in Section 9.5.1.3.

The noise emissions from the Project were predicted using the SoundPLAN 7.1 noise modelling software package computer model. This model uses a three dimensional digital terrain map together with noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. It is noted that the operational scenario modelled is likely to represent an acoustically worst-case scenario.

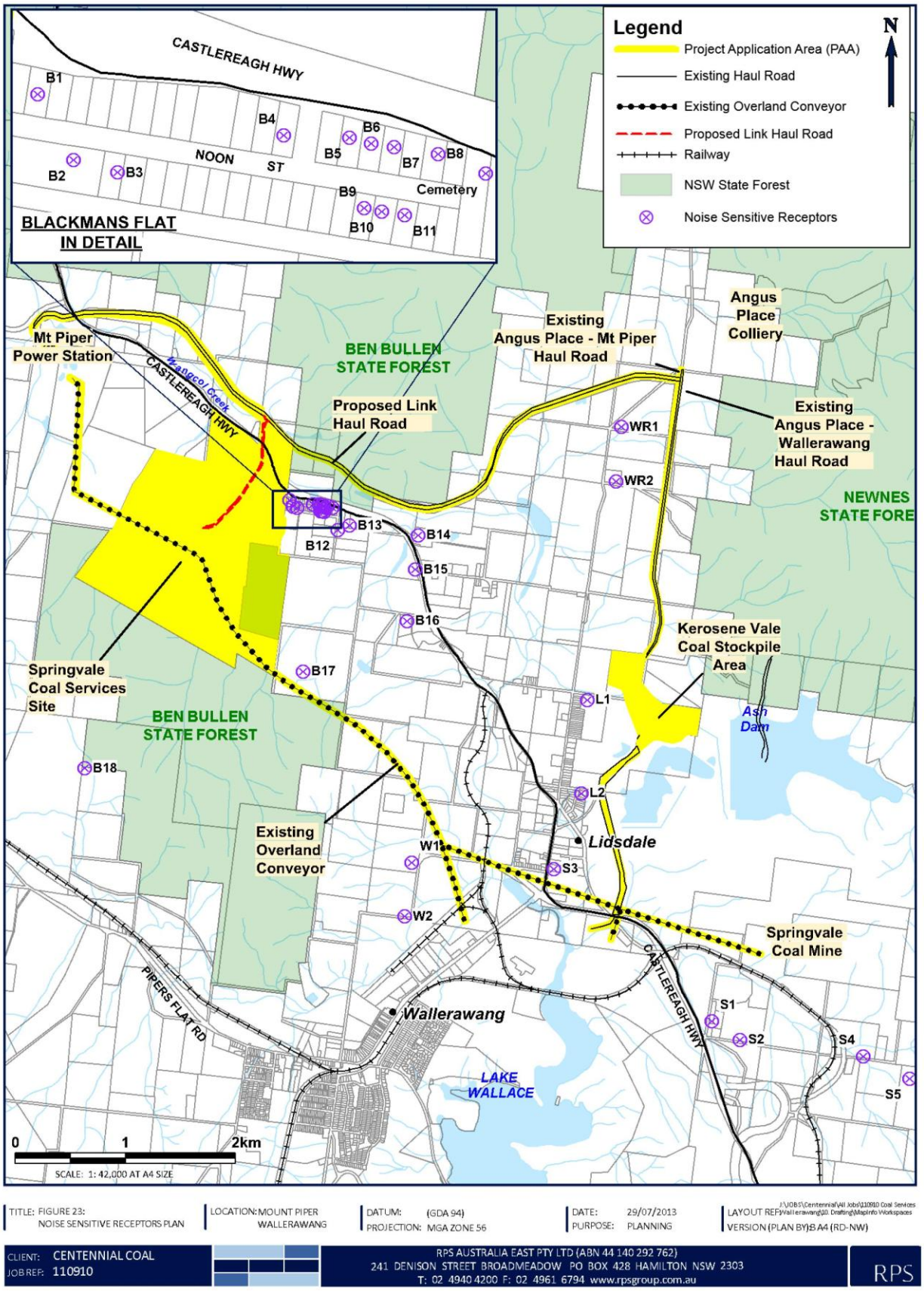
The scope of the Assessment was also designed to address the Director-Generals Requirements (DGRs) for the Project with regard to noise. Significant findings and recommendations from the Noise Impact Assessment are summarised below. Further details regarding the Assessment methodology, data used for the Assessment, and the identified potential impacts are contained in **Appendix 2.**

9.5.1.2 Existing Environment

Ambient noise surveys were conducted to characterise and quantify the existing acoustic environment during the day, evening and night-time periods for a number of residences identified as sensitive receptors within the PAA. The locations of these receptors are shown in **Figure 23.** The locations of the identified sensitive receptors have been categorised (Blackmans Flat, Wallerawang, Lidsdale, Wolgan Road and Springvale) according to location and in relation to the source of noise from the Project. Receptors B1 and B3 are owned by Centennial Coal.

A description of the background noise environment for the five categorised locations is provided below.

Figure 23 Plan of Noise Sensitive Receptors – Locations



Blackmans Flat

The background noise measurements conducted at Blackmans Flat were influenced by existing noise contribution from the Springvale Coal Services Site. In order to obtain a representative background noise level in the absence of the Springvale Coal Services Site the background noise measurements were adjusted to remove the contribution of the site. During the evening and night periods, when noise from the Castlereagh Highway decreased, background noise levels at and below 30 dBA were recorded in the absence of noise from the Springvale Coal Services Site. The adjusted ambient noise levels for Blackmans Flat are contained within **Table 15.**

Table 15 Summary of Existing Ambient Noise Levels Blackmans Flat (excluding the Project)

Location	Period	Rating Background Level (RBL)	Estimated Existing Industrial Contribution LAeq
B1 Southern Boundary	Day	37 dBA	<49 dBA
	Evening	30 dBA	<39 dBA
	Night	30 dBA	<34 dBA

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am. On Sundays and Public Holidays, Daytime 8.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 8.00 am
The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level.

The LAeq represents the equivalent continuous noise level and is defined as the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Wallerawang

An environmental assessment has recently been completed for the Lidsdale Siding Upgrade Project. As part of this assessment a noise impact assessment was prepared by Hatch Associates in August 2012. Approval for the Lidsdale Siding Upgrade Project was granted on 3 May 2013 (MP 08_0223). As the operation of the overland conveyor will not change as a result of the Project the noise limits provided in MP 08_0223 have been utilised for the purpose of this assessment.

Lidsdale

Angus Place Colliery currently operates under Project Approval 06_0021 (MP 06_0021) which provides noise criteria for residences in Lidsdale. The noise criteria specified in MP 06_0021 have been established following an INP assessment at the Lidsdale village. The operation of the Wallerawang Haul Road and overland conveyor are consented and approved operations and these operations will not change as a result of the Project. The noise limits provided in MP 06_0021 are, therefore, deemed appropriate and have been utilised at Lidsdale village receptors for the purpose of this assessment.

Wolgan Road

Angus Place Colliery currently operates under MP 06_0021 which provides noise criteria for residences in Wolgan Road. The noise criteria specified in MP 06_0021 have been established following an INP assessment at the Wolgan Road locations. The operation of the Wallerawang Haul Road and Mt Piper Haul Road are consented and approved operations and these operations will not change as a result of the Project. The noise limits provided in MP 06_0021 are, therefore, deemed appropriate and have been utilised at Wolgan Road residences for the purpose of this assessment.

Springvale

In order to determine existing ambient noise levels at Springvale, SLR Consulting has conducted background noise monitoring on a quarterly basis at Springvale since December 2010. The background noise monitoring consisted of continuous unattended noise logging, and operator attended noise surveys. The operator attended noise surveys were used to define existing noise sources (including Springvale Mine), the character of noise in the area, and to qualify unattended noise logging results. Background noise monitoring was conducted at locations S1 and S2 as identified in **Figure 23.**

Background noise monitoring at Springvale consisted of continuous, unattended noise logging for a period of at least seven (7) days and operator attended noise surveys each quarter at locations S1, S2 and S3 as identified in **Figure 23**. The operator attended noise surveys were used to define existing noise sources (including Springvale Coal Mine) and the character of noise in the area and also used to qualify unattended noise logging results.

The daytime, evening and night-time RBLs at locations S1, S2 and S3 in the absence of existing Springvale operations have been established by determining the typical minimum background noise level. It has been assumed that the typical minimum background noise levels are representative of the periods which are not impacted by Springvale operations.

The typical minimum level of all the measured background noise levels was determined for each assessment period based on the lowest 10th percentile of all Assessment Background Levels (ABLs), determined in accordance with the INP, measured between December 2010 and September 2012.

For residential receivers further from the Castlereagh Highway, Wallerawang Power Station and mining operations (receiver locations S4 and S5), a minimum RBL of 30 dBA has been adopted in accordance with Section 3.1.2 of the INP.

The typical minimum daily measured background noise levels for receiver locations S1 to S5 are presented in **Table 16.**

Table 16 Typical Minimum Measured Background – Springvale

Receiver Area	Typical Minimum Measured L_{A90} [1] All Noise Sources		
	Day	Evening	Night
S1	40	39	37
S2	38	38	38
S3	42	44	45
S4	30	30	30
S5	30	30	30

1 Typical Measured LA90: This is the typical minimum background noise level during all measurement surveys. This is taken to be the lower 10th percentile of the ABLs during the relevant periods.

The levels presented in **Table 16** have been assumed to be representative of the Rating Background Level at location S1 and S2 in the absence of Springvale operations. At location S3 there are significant industrial noise contributions from the Wallerawang Power Station and the Castlereagh Highway which influence the ambient noise levels at the site. Operator attended monitoring at location S3 have identified an industrial noise contribution in the absence of the Project (overland conveyor) of LAeq(15minute) of 51 dBA. The controlling criteria at this location will be based on amenity levels.

Noise Assessment Methodology

Two methods were used by the Noise and Vibration Impact Assessment to assess noise emission from the Project. The methods are outlined as follows:

- NSW Industrial Noise Policy (INP) Assessment - where modifications to an existing operation are planned (eg Springvale Coal Services site) the assessment was carried out in accordance with the INP.
- Existing Project Approval – where the operation of existing infrastructure remains unchanged and project approval noise conditions are in place the Project was assessed against the relevant project approvals. The determination and application of noise limits in accordance with the INP are typically triggered by new developments or modifications to existing developments.

For assessing intrusiveness background noise level must be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (LAeq) of the source should not be more than five decibels above the measured background level (LA90). Background noise levels were established for Blackmans Flat, Wallerawang, Springvale and residences near the existing private haul roads.

The INP also provides amenity criteria for specific land uses and associated activities. If the anticipated noise levels from the Project approaches the criterion value then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion.

Project Specific Noise Criteria can then be established for each location which is then used to assess the impacts from modelled noise emissions from the Project. Noise emissions from the Project have been assessed under five separate scenarios as detailed below. Both options for the Link Haul Road were also assessed. These scenarios are based around receptor groups being the residential area of Blackmans Flat and surrounds, Wallerawang, Lidsdale, Wolgan Road and near the Springvale Pit Top on Springvale Lane and relate to the worst case scenario.

Scenario 1

This scenario is representative of operations utilising the Option 1 Link Haul Road and the resultant impacts on the main residential area of Blackmans Flat. It includes the operation of the upgraded Springvale Coal Services site, existing overland conveyors and with coal haulage from Angus Place on the Mt Piper Haul Road. This scenario does not include activities at Kerosene Vale Stockpile Area or Wallerawang Haul Road as these activities do not contribute to noise impacts at Blackmans Flat. This scenario is also used for receptors near Wallerawang, Wolgan Road and residents near Springvale Mine although the main influence on noise in these locations is the overland conveyor and/or Mt Piper Haul Road. The results of this scenario are provided in Table 39 of the Noise and Vibration Impact Assessment in **Appendix 2**.

Scenario 2

This scenario is representative of operations utilising the Option 2 Link Haul Road and the resultant impacts on the main residential area of Blackmans Flat. It includes the upgraded Springvale Coal Services Site, existing overland conveyors and with coal haulage from Angus Place on the Mt Piper Haul Road. This scenario does not include activities at Kerosene Vale Stockpile Area or the Wallerawang Haul Road as these activities do not contribute to noise impacts at Blackmans Flat. This scenario is also used for receptors near Wallerawang, Wolgan Road and residents near Springvale Coal Mine although the main influence on noise in these locations is the overland conveyor and/or Mt Piper Haul Road. Results for this scenario for receptors in the main residential area of Blackmans Flat are summarised in **Table 17.** This scenario is also used for receptors near Wallerawang as detailed in **Table 18**, and Wolgan Road as detailed in **Table 22** although the main influence on noise in these locations is the overland conveyor.

Scenario 3

This scenario, during the day and evening, is representative of operations of the upgraded Springvale Coal Services Site, existing overland conveyors, the preferred Link Haul Road (Option 2) for rejects dispatch, coal haulage from a future project only and coal haulage from Angus Place on the Wallerawang Haul Road to Wallerawang Power Station. During the night-time period this scenario is representative of operations of the upgraded Springvale Coal Services Site, existing overland conveyors, the Link Haul Road (Option 2) with coal haulage from Angus Place on the Mt Piper Haul Road. This scenario is relevant to Lidsdale, Wolgan Road and Lidsdale receptors and the results of this scenario are provided in **Table 19**, **Table 23** and **Table 24** respectively.

Scenario 4

This scenario, during the day, is representative of operations of the upgraded Springvale Coal Services Site, existing overland conveyors, the Link Haul Road (Option 2) road for rejects dispatch, coal haulage from a future project only and coal haulage from Angus Place on the Wallerawang Haul Road to the Kerosene Vale Coal Stockpile Area. During the evening the Kerosene Vale Stockpile Area will not operate. During the night time period this scenario is representative of operations of the upgraded Springvale Coal Services Site, existing overland conveyors, the Link Haul Road (Option 2) with coal haulage from Angus Place on the Mt Piper Haul Road. This scenario is also relevant to Lidsdale receptors as it includes the option of transporting coal to the Kerosene Vale Coal Stockpile Area. The results are provided in **Table 20**.

Scenario 5

This scenario, during the day, is representative of operations of the upgraded Springvale Coal Services Site, existing overland conveyors, the Link Haul Road (Option 2) for rejects dispatch, coal haulage from a future project only and coal haulage from the Kerosene Vale Coal Stockpile Area on the Wallerawang Haul Road. During the evening the Kerosene Vale Stockpile Area will not operate. During the night-time period this scenario is representative of operations of the upgraded Springvale Coal Services Site, existing overland conveyors, the Link Haul Road (Option 2) with coal haulage from Angus Place on the Mt Piper Haul Road. This scenario is relevant to receptors at Lidsdale as it includes loading coal from the Kerosene Vale Coal Stockpile Area. The results are provided in **Table 21.**

The results of the assessment is provided in full as **Appendix 2** and summarised in the following sections.

9.5.1.3 Noise Impact Assessment

Potential noise impacts have been assessed for the entire Project including the existing overland conveyors and private haul roads as well as the new Link Haul Road and the upgrade of the Springvale Coal Services Site. The assessment of noise impacts from the Project has involved a reiterative process of modelling various scenarios using different transport arrangements in order to meet the Project Specific Noise Criteria for the existing private haul roads. The process has included the requirement to meet the noise criteria set out in the Angus Place PA06_0021 approval. To achieve this at the Wolgan Road receptors, the Project will reduce truck movements along Mt Piper Haul Road during prevailing noise enhancing weather conditions. The default level will be zero trucking during these prevailing conditions until such time as noise monitoring confirms the truck movements required to meet the Project Specific Noise Criteria during these conditions.

As summarised below, the residential area of Blackmans Flat is impacted by the proposed upgrade of the Springvale Coal Services Site and the new Link Haul Road while receptors in Wallerawang, Lidsdale, Wolgan Road and Springvale will not be further impacted by the existing overland conveyors and private haul roads.

Blackmans Flat

Predicted noise emission levels from the Project utilising the preferred Link Haul Road (Option 2), as identified in **Figure 22** in Section 8 of this EIS, at the nearest most potentially affected residential receptors at Blackmans Flat are provided in **Table 17**. Receptors B1 and B3 are owned by Centennial and have not been included in **Table 17**. Figures in bold represent noise levels above the respective Project Specific Noise Criteria, refer to bottom of **Table 17**, established by the Noise and Vibration Impact Assessment.

Table 17 Predicted Operational Noise Levels – Blackmans Flat (Scenario 2)

Location	Predicted Intrusive Noise Level $L_{Aeq(15minute)}$ (dBA)					
	Day	Evening		Night		
	Calm	Calm	Wind[1]	Calm	Wind[1]	Inversion[2]
B2	42	**38**	**42**	**38**	**36**	**42**
B4	42	**37**	**39**	**37**	35	**39**
B5	42	**37**	**39**	**37**	**36**	**39**
B6	42	**37**	**39**	**37**	**36**	**39**
B7	42	**37**	**38**	**37**	**36**	**38**
B8	42	**37**	**38**	**37**	**36**	**38**
B9	41	**37**	**39**	**37**	35	**39**
B10	41	**37**	**38**	**37**	35	**38**
B11	41	**37**	**38**	**37**	35	**38**
B12	40	34	32	34	32	31
B13	41	**36**	**36**	**36**	34	**36**
B14	41	35	33	35	32	32
B15	**36**	32	35	32	<30	35
B16	33	32	35	32	<30	**36**
B17	**42**	**42**	**44**	**42**	**43**	**45**
B18	<30	<30	<30	<30	<30	<30
Cemetery	42	37	38	N/A	N/A	N/A
Project Specific Noise Criteria	***42 (B2-B14)*** ***35 (B15-B18)*** ***50 Cemetery***	***35 (B2-B18)*** ***50 Cemetery***		***35 (B2 to B18)*** ***50 Cemetery***		

1 Results shown are from the highest predicted noise level under prevailing winds.
2 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow.

The results contained in **Table 17** show that significant exceedances of the Project Specific Noise Criteria are predicted, predominantly during the evening and night period, at the majority of residential receivers surrounding the Project. Scenario 1 which includes the easterly Link Haul Road (Option 1) results in an additional 2 dB(A) to 6 dB(A) for receptors B2 to B11 within the residential area of Blackmans Flat. Further discussion on the predicted noise exceedences under this option is contained in the Noise and Vibration Impact Assessment contained within **Appendix 2**. Predicted noise levels at B17 are above the Project Specific Noise Criteria. This is due to the existing overland conveyor. Springvale Coal has a negotiated agreement with this resident.

Wallerawang

Predicted noise emission levels from the Project at the nearest most potentially affected residential receptors are provided in **Table 18**. These predicted levels are based upon the preferred Link Haul Road (Option 2) as identified in **Figure 22** in Section 8 of this EIS, and coal haulage along the Angus Place - Mt Piper Haul Rd.

Table 18 Predicted Operational Noise Levels – Wallerawang (Scenario 2)

Location	Predicted Intrusive Noise Level LAeq(15minute) (dBA)			
	Day	Evening	Night	
	Calm	Calm	Calm	Inversion[1]
W1	37	37	37	41
W2	31	32	32	36
Project Specific Noise Criteria	***43 (W1)*** ***47 (W2)***	***43 (W1)*** ***47 (W2)***	***43 (W1)*** ***47 (W2)***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow.

The results contained in **Table 18** show that noise levels from the Project are predicted to meet the noise conditions set out in the project approval of the Lidsdale Siding Upgrade Project (MP 08_0223) under all operating conditions.

Lidsdale

Predicted noise emission levels from the Project at the nearest most potentially affected residential receptors are provided in **Table 19, Table 20** and **Table 21**. Figures in **bold** represent noise levels above the relevant Project Specific Noise Criteria.

Table 19 Predicted Operational Noise Levels – Lidsdale – (Scenario 3)

Location	Predicted Intrusive Noise Level LAeq(15minute) (dBA)			
	Day	Evening	Night	
	Calm	Calm	Calm	Inversion[1]
L1	36	35	<30	30
L2	40	39	<30	31
Project Specific Noise Criteria	***44***	***40***	***35***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow.

Table 20 Predicted Operational Noise Levels – Lidsdale – (Scenario 4)

Location	Predicted Intrusive Noise Level LAeq(15minute) (dBA)			
	Day	Evening	Night	
	Calm	Calm	Calm	Inversion[1]
L1	42	35	<30	30
L2	29	30	<30	31
Project Specific Noise Criteria	***44***	***40***	***35***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow.

Table 21 Predicted Operational Noise Levels – Lidsdale – (Scenario 5)

Location	Predicted Intrusive Noise Level LAeq(15minute) (dBA)			
	Day	Evening	Night	
	Calm	Calm	Calm	Inversion[1]
L1	42	43	<30	30
L2	40	39	<30	31
Project Specific Noise Criteria	***44***	***40***	***35***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow.

The results contained in **Table 19, Table 20** and **Table 21** show that noise levels from the Project are predicted to meet the noise criteria set out in Angus Place MP 06_0021 approval under all operating conditions.

Wolgan Road

Predicted noise emission levels of the Project, for operation of either the Mt Piper Haul Road or the Wallerawang Haul Road, at the nearest most potentially affected residential receptors are provided in **Table 22** and **Table 23**. The cumulative impact of the haul roads and Angus Place Colliery has been considered in the analysis.

Table 22 Predicted Operational Noise Levels - Wolgan Road – (Scenario 2)

Location		Predicted Intrusive Noise Level LAeq(15minute) (dBA)			
		Day	Evening	Night	
		Calm	Calm	Calm	Inversion[1]
WR1	Haulage Only	40	33	33	N/A[2]
	Haulage & Angus Place	41	36	36	N/A[2]
WR2	Haulage Only	33	<30	<30	N/A[2]
	Haulage & Angus Place	35	32	32	N/A[2]
Project Specific Noise Criteria		***42 (WR1)*** ***41 (WR2)***	***38(WR1)*** ***37(W2R)***	***36(W1)*** ***35(W2)***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow

2 The Project will include reduced truck movements along Mt Piper Haul Road during adverse weather conditions.

Table 23 Predicted Operational Noise Levels - Wolgan Road – (Scenario 3)

Location		Predicted Intrusive Noise Level LAeq(15minute) (dBA)			
		Day	Evening	Night	
		Calm	Calm	Calm	Inversion[1]
WR1	Haulage Only	36	36	33	N/A[2]
	Haulage & Angus Place	38	38	36	N/A[2]
WR2	Haulage Only	37	36	29	N/A[2]
	Haulage & Angus Place	38	37	32	N/A[2]
Project Specific Noise Criteria		***42 (WR1)*** ***41 (WR2)***	***38(WR1)*** ***37(W2R)***	***36(W1)*** ***35(W2)***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a WSW drainage flow.

2 The Project will include reduced truck movements along Mt Piper Haul Road during adverse weather conditions.

The results contained in **Table 22** and **Table 23** show that noise levels from the Project will meet the noise criteria set out in Angus Place PA06_0021 approval under all operating conditions with reduced truck movements during prevailing noise enhancing weather conditions. The default level will be zero trucking during these prevailing conditions until such time as noise monitoring confirms the truck movements required to meet the Project Specific Noise Criteria during these conditions.

Springvale

Predicted noise emission levels from the Project at the nearest most potentially affected residential receptors are provided in **Table 24** for Scenario 3. Figures in bold represent noise levels above the relevant Project Specific Noise Criteria.

Table 24 Predicted Operational Noise Levels – Springvale – (Scenario 3)

Location	Predicted Intrusive Noise Level LAeq (15minute) (dBA)					
	Day		Evening		Night	
	Calm			Calm	Calm	Inversion[1]
S1	<30			<30	<30	32
S2	<30			<30	<30	30
S3	36			36	36	39
S4	<30			<30	<30	<30
S5	<30			<30	<30	<30
Project Specific Noise Criteria	***45 (S1)*** ***43 (S2)*** ***47 (S3)*** ***35 (S4 & S5)***			***44 (S1)*** ***43 (S2)*** ***41 (S3)*** ***35 (S4 & S5)***	***40 (S1)*** ***40 (S2)*** ***41 (S3)*** ***35 (S4 & S5)***	

1 Results shown are from the highest predicted result under a temperature inversion with or without a drainage flow

The results contained in **Table 24** show that noise levels from the Project are predicted to meet the Project Specific Noise Criteria for Springvale derived in accordance with the INP. At S1, S2, S4 and S5 noise levels predicted for the existing overland conveyor are low when compared to the entire Springvale Coal Mine operation. This means that the noise impact of the Project will be insignificant in relation to noise from Springvale Coal Mine at these locations.

9.5.1.4 Cumulative Noise Assessment

A review of major approved and proposed industrial developments in the vicinity of the Project was conducted by the Noise and Vibration Assessment and is presented in **Table 25**. Other projects in the general area include the Lidsdale Siding Upgrade Project, the proposed Angus Place Mine Extension Project and the Springvale Coal Mine Extension Project. These projects due to their respective locations do not impact on the cumulative noise from the Project at the assessed noise sensitive receptors.

Table 25 Approved or Proposed Industrial Developments in the Vicinity of the Project

Development Site	Approval Date	Development Status	Source of Noise Data
Mount Piper Power Station Ash Placement Project	February 2012	Approved	Project Approval 09_0186
Mount Piper Power Station Western Coal Loader	June 2009	Approved	Project Approval 06_0271
Mount Piper Power Station Base Load Power Station	January 2010	Approved	Project Approval 09_0119
Blackmans Flat Waste Management Facility	August 2006	Approved	Geolyse 2006
Pine Dale Coal Mine Yarraboldy	February 2011	Approved	Project Approval 10_0041
Pine Dale Coal Mine St 2 Extension	N/A	Proposed	Assumed same criteria as Pine Dale Yarraboldy

The anticipated operating noise levels from each of the Projects identified in **Table 25** have been established by reviewing the project approvals or environmental assessments and then used for the purposes of the cumulative noise amenity assessment.

The potential for the simultaneous operation of the Project and other approved and proposed projects can be assessed on a worst case scenario basis by adding the predicted noise levels from the proposed and approved operations together. The cumulative intrusive level is then adjusted (by -3 dBA) to the equivalent amenity level for comparison with the relevant amenity criteria for each location.

It should be noted that, for each of the projects assessed, the likelihood of the existing, future approved developments as well as the Project emitting simultaneous maximum noise emissions is remote due to the range of development locations and differences in the noise enhancing weather effects. This cumulative assessment is therefore considered to be conservative. Given the significant intervening topography and distance of B18 from the approved or proposed developments provided in **Table 25**, B18 has not been considered as part of this cumulative assessment as cumulative noise levels are likely to be below the relevant amenity criteria.

The daytime, evening and night-time cumulative noise levels, together with the acceptable and maximum LAeq(period) noise amenity criteria for representative receivers B2 to B17 are presented in **Table 26, Table 27** and **Table 28** respectively.

Table 26 Cumulative Daytime Noise Amenity Levels

Location	Springvale Coal Services	Mount Piper Power Station Ash Placement Project	Mount Piper Power Station Western Coal Loader	Mount Piper Power Station Base Load Power Station	Blackmans Flat Waste Manage-ment Facility	Pine Dale Yarra-boldy	Cumulative Intrusive Noise Level	Cumulative Amenity (intrusive sum minus 3 dBA)	Acceptable Maximum Range
B2	42	42	35	36	40	42	48	45	55 to 60
B4	42	42	35	36	40	42	48	45	
B5	42	42	35	36	40	42	48	45	
B6	42	42	35	36	40	42	48	45	
B7	42	42	35	36	40	42	48	45	
B8	42	42	35	36	40	42	48	45	
B9	41	42	35	36	40	42	48	45	
B10	41	42	35	36	40	42	48	45	
B11	41	42	35	36	40	42	48	45	
B12	40	42	35	36	40	42	48	45	
B13	41	42	35	36	40	42	48	45	
B14	41	42	35	36	40	42	48	45	
B15	36	42	35	36	40	42	47	44	
B16	33	42	35	36	40	42	47	44	
B17	42	42	35	36	40	42	48	45	

Table 27 Cumulative Evening Noise Amenity Levels

Location	Springvale Coal Services Site	Mount Piper Power Station Ash Placement Project	Mount Piper Power Station Western Coal Loader	Mount Piper Power Station Base Load Power Station	Blackmans Flat Waste Manage-ment Facility	Pine Dale Yarra-boldy and Stage 2	Cumulative Intrusive Noise Level	Cumulative Amenity (intrusive sum minus 3 dBA)	Acceptable Maximum Range
B2	42	38	35	36	N/A	39	46	43	45 to 50
B4	39	38	35	36	N/A	39	45	42	
B5	39	38	35	35	N/A	39	45	42	
B6	39	38	35	35	N/A	39	45	42	
B7	38	38	35	35	N/A	39	44	41	
B8	38	38	35	35	N/A	39	44	41	
B9	39	38	35	35	N/A	39	45	42	
B10	38	38	35	35	N/A	39	44	41	
B11	38	38	35	35	N/A	39	44	41	
B12	32	38	35	35	N/A	35	42	39	
B13	36	38	35	35	N/A	35	43	40	
B14	33	38	35	35	N/A	35	43	40	
B15	35	38	35	35	N/A	35	43	40	
B16	35	38	35	35	N/A	35	43	40	
B17	44	38	35	35	N/A	35	46	43	

Table 28 Cumulative Night-time Noise Amenity Levels

Location	Springvale Coal Services Project	Mount Piper Power Station Ash Placement Project	Mount Piper Power Station Western Coal Loader	Mount Piper Power Station Base Load Power Station	Blackmans Flat Waste Manage-ment Facility	Pine Dale Yarra-boldy and Stage 2	Cumulative Intrusive Noise Level	Cumulative Amenity (intrusive sum minus 3 dBA)	Acceptable Maximum Range
B2	42	35	35	35	N/A	35	45	**42**	40 to 45
B4	39	35	35	35	N/A	35	43	40	
B5	39	35	35	35	N/A	35	43	40	
B6	39	35	35	35	N/A	35	43	40	
B7	38	35	35	35	N/A	35	43	40	
B8	38	35	35	35	N/A	35	43	40	
B9	39	35	35	35	N/A	35	43	40	
B10	38	35	35	35	N/A	35	43	40	
B11	38	35	35	35	N/A	35	43	40	
B12	31	35	35	35	N/A	35	41	38	
B13	36	35	35	35	N/A	35	42	39	
B14	32	35	35	35	N/A	35	42	39	
B15	35	35	35	35	N/A	35	42	39	
B16	36	35	35	35	N/A	35	42	39	
B17	45	35	35	35	N/A	35	46	**43**	

As presented in **Table 26, Table 27** and **Table 28,** the predicted cumulative amenity noise levels from existing, approved and proposed mining and industrial noise sources, and the Project are at, or below, the relevant acceptable amenity levels for suburban receivers at all locations during the daytime and evening period.

During the night period, the cumulative amenity noise level exceeds the acceptable level of 40 dBA at Locations B2 and B17, but remains below the maximum noise level of 45 dBA.

9.5.1.5 Sleep Disturbance Analysis

In assessing sleep disturbance from typical night-time activities associated with the Project, LAmax noise levels of acoustically significant plant and equipment to be in use were used as input to the noise model. LAmax noise level predictions were made at the nearest residential areas under adverse weather conditions during the night. The use of the LAmax noise level provides a worst-case prediction since the LA1 (1-minute) noise level of a noise event is likely to be less than the LAmax.

In relation to the receptors located at Wallerawang, Lidsdale, and Springvale, the results of sleep disturbance modelling indicate that maximum noise levels generated by the Project will comply with Sleep Disturbance Goals calculated for the nearest affected receptors in the respective areas. Further details of the Sleep Disturbance Goals, and the results for these areas, can be found in **Appendix 2**.

Blackmans Flat

Maximum noise levels from the Springvale Coal Services Site are likely to be associated with trucks using the Link Haul Road. According to the Noise Impact Assessment, the representative maximum sound power level for a truck operating on the Link Haul Road is 124 dBA. The predicted maximum noise levels from the Project, utilising the preferred Link Haul Road route, under worst case atmospheric conditions are contained in **Table 29**.

Table 29 Predicted Sleep Disturbance Noise Levels – Blackmans Flat

Location	Predicted Maximum Noise Level L_{Amax} (dBA)	Sleep Disturbance Noise Goal $L_{A1(1minute)}$ (dBA)
	Link Haul Road	
B2	**56**	45
B4	**57**	45
B5	**58**	45
B6	**58**	45
B7	**59**	45
B8	**59**	45
B9	**57**	45
B10	**57**	45
B11	**57**	45
B12	**56**	45
B13	**59**	45
B14	**64**	45
B15	**53**	45
B16	45	45
B17	39	45
B18	<30	45

The result of sleep disturbance modelling indicates that maximum noise levels generated by the Project are predicted to exceed the sleep disturbance noise goals at all residential locations, with the exception of Location B16, B17 and B18. It should be noted that the external maximum noise levels at all receptors are below 65 dBA. This infers that internal levels (assuming a 10 dBA reduction from outside to inside – with windows open) will be below 55 dBA and are therefore unlikely to cause awakening reactions.

Wallerawang

Maximum noise levels from the Project are likely to be associated with the existing overland conveyor. These conveyors are relatively continuous in operation and a maximum noise level for the overland conveyor is 79 dBA. The predicted maximum noise levels from the Project under worst case atmospheric conditions are contained in **Table 30**.

Table 30 Predicted Sleep Disturbance Noise Levels – Wallerawang

Location	Predicted Maximum Noise Level LAmax (dBA)	Sleep Disturbance Noise Goal $L_{A1(1minute)}$ (dBA)
W1	45	51
W2	40	51

The results of sleep disturbance modelling indicates that maximum noise levels generated by the Project will comply with sleep disturbance goals at the nearest affected receptors.

Lidsdale

Maximum noise levels from the Project are likely to be associated with the existing overland conveyor. The predicted maximum noise levels from the Project under worst case atmospheric conditions are contained in **Table 31.**

Table 31 Predicted Sleep Disturbance Noise Levels – Lidsdale

Location	Predicted Maximum Noise Level L_{Amax} (dBA)	Sleep Disturbance Noise Goal $L_{A1(1minute)}$ (dBA)
L1	34	45
L2	35	45

The results of sleep disturbance modelling indicates that maximum noise levels generated by the Project will comply with sleep disturbance goals at the nearest affected receptors.

Wolgan Road

Maximum noise levels from the Project are likely to be associated with trucks using the existing haul roads. The predicted maximum noise levels from the Project under worst case atmospheric conditions are contained in **Table 32**.

Table 32 Predicted Sleep Disturbance Noise Levels – Wolgan Road

Location	Predicted Maximum Noise Level LAmax (dBA)	Sleep Disturbance Noise Goal $L_{A1(1minute)}$ (dBA)
WR1	**57**	46
WR2	**48**	45

The results of sleep disturbance modelling indicate that maximum noise levels generated from vehicle movements on the Angus Place to Mt Piper Haul Road are predicted to exceed the sleep disturbance noise goal at the closest affected residential locations. It should be noted that the external maximum noise levels at all receptors are below 65 dBA. This infers that internal levels (assuming a 10 dBA reduction from outside to inside – with windows open) will be below 55 dBA and are therefore unlikely to cause awakening reactions.

Springvale

Maximum noise levels from the Project are likely to be associated with the existing overland conveyor. The predicted maximum noise levels from the Project under worst case atmospheric conditions are contained in **Table 33**.

Table 33 Predicted Sleep Disturbance Noise Levels – Springvale

Location	Predicted Maximum Noise Level LAmax (dBA)	Sleep Disturbance Noise Goal $L_{A1(1minute)}$ (dBA)
S1	36	52
S2	34	53
S3	43	57
S4	31	45
S5	<30	45

The results of sleep disturbance modelling indicates that maximum noise levels generated by the Project will comply with sleep disturbance goals at the nearest affected receptors

9.5.1.6 Construction Noise Assessment

Construction activities associated with the Project would include the construction of an additional Washery, upgrade of associated infrastructure, and the construction of the internal Link Haul Road – all within the Springvale Coal Services Site.

The construction scenario modelled is contained within **Table 34**. It should be noted that the construction noise modelling assumes that all the equipment is operating simultaneously at the closest location of construction to each residential location. This scenario represents a worst-case which may only occur infrequently and for relatively short time periods.

Table 34 Washery and Internal Link Haul Road at Springvale Coal Services Site

Plant and Equipment	Day
Excavator	✓(2)
Backhoe	✓(2)
Grader	✓
Crane	✓(2)
Concrete truck	✓(3)
Compactor flat	✓

As the Springvale Coal Services Site operates 24 hours per day, 7 days per week, and needs to continue to do so during the construction period, some construction activities will need to occur outside normal construction hours. This will include any works which involve interactions with the current operation of the Washery, conveyors, stockpiles or the Mt Piper Haul Road or the Castlereagh Highway.

The results of the construction noise modelling are contained within **Table 35.**

Table 35 Predicted Construction Noise Levels

Location	Predicted Construction Noise Level LAmax (dBA)	Management Level LAeq(15minute) (dBA)	
	Day	Noise Affected	Highly Noise Affected
B2	**61**	47	75
B4	**56**	47	
B5	**53**	47	
B6	**49**	47	
B7	47	47	
B8	46	47	
B9	45	47	
B10	45	47	
B11	45	47	
B12	45	47	
B13	44	47	
B14	40	47	
B15	39	47	
B16	30	47	
B17	<30	47	
B18	<30	40	
Cemetery	45	47	

The results of construction noise modelling indicate that the noise affected management level is predicted to be achieved at all residential locations, with the exception of B2, B4 B5 and B6, where an exceedance of from 2 dBA to 14 dBA is predicted to occur. It should be noted that the predicted construction noise levels are below the *highly noise affected* level for the scenarios considered. Exceedance of the construction noise management level is typical for construction sites in close proximity to receivers. As such, there is need for appropriate noise management and planning.

9.5.1.7 Road Traffic Noise Assessment

The existing and Project related traffic flows on the Castlereagh Highway are provided in **Table 36.**

Table 36 Existing and Project Related Traffic Volumes

Location	Time Period	Existing Traffic Flows[1]	Construction Peak (incl existing operational staff)	Operational
Castlereagh Highway	Daytime (7 AM to 10 PM)	4300	140	24
	Night (10 PM to 7 AM)	592	130	12

1 Existing traffic flows sourced from Traffic Impact Assessment – Western Coal Services Project prepared by Barnson Pty Ltd. Assumed night-time volume 12% AADT

Based upon the expected road traffic movements, during construction, presented in Table 37 road traffic noise from the Castlereagh Highway is predicted to increase by 0.1 dBA in the daytime period and 0.9 dBA at night. During operation of the Project road traffic noise levels are predicted to increase by less than 0.1dBA during the day and night-time period.

As detailed in the RNP, an increase of up to 2 dBA represents a minor impact that is considered barely perceptible for the average person, and on this basis, the predicted impact due to an increase in road traffic noise from the Castlereagh Highway from Project related traffic is considered to be negligible.

9.5.1.8 Vibration Assessment

The use of explosives may be required to dislodge and fracture rock to enable its extraction and removal during the construction of the Link Haul Road. To achieve this, holes would be drilled into the rock in a designed pattern that gives strict attention to their angle, depth and spacing. These holes are then filled with an explosive charge and initiated with the aid of primers and detonators. The detonation of holes would be delayed in a pre-designed sequence to ensure that holes are fired in quick succession. A delayed firing technique improves the efficiency of the blast and also reduces its environmental impacts.

The infrastructure and properties potentially affected by the construction blasting, should it be required, includes suspended transmission lines and Blackmans Flat residences.

The levels of ground vibration and air blast have been predicted from the nearest potential blasting location to the surface infrastructure for various industry standard values. Should blasting be required for the Project, monitoring would be conducted to ensure compliance with relevant criteria, and validate the blasting predictions of the Noise and Vibration Impact Assessment.

Based on the predicted buffer distances, construction vibration levels are predicted to be significantly below the relevant damage and annoyance risk criteria at all residential receivers. The closest residential receiver (B1) is located approximately 120 metres from vibratory rolling activities.

In relation to road traffic vibration, trucks travelling to and from the Project have the potential to generate ground-borne vibration.

Previous assessments of truck vibration levels reviewed by the Noise and Vibration Impact Assessment have indicated that haulage trucks travelling at 80 km/hr or less were predicted to generate vibration levels well below the vibration damage criteria of 5 mm/s at residences a distance of 7.5 m or greater from the road.

The Noise and Vibration Impact Assessment notes that receivers are located at a distance of greater than 20m from the Link Haul Road, and as such, no road traffic vibration impacts are predicted at the nearest residential receivers.

9.5.1.9 Consequences of Potential Noise Impacts

Operational Noise Modelling Results

The results of the Noise and Vibration Impact Assessment indicate that there will be likely residual noise impacts above the Project Specific Noise Criteria at some of the receptors within the main residential area of Blackmans Flat. Considering the effectiveness of all mitigation options available, individual agreements between Springvale Coal and each private property owner within the main residential area of Blackmans Flat are being prepared. This outcome is considered appropriate given both the level of impact that currently exists and in recognition of the proposals that are being assessed for the expansion of mine related projects. Further discussion regarding agreements with the residents of the main residential area of Blackmans Flat is discussed in Section 9.5.4 of this EIS.

In relation to noise receivers in Wallerawang, the results of the Noise and Vibration Impact Assessment indicate that the Project will meet the noise criteria set out in the project approval for the Lidsdale Siding Upgrade Project (MP 08_0223) under all operating conditions.

Noise predictions for Lidsdale receivers indicate that the Project will meet the noise criteria set out in Angus Place PA06_0021 under all operating conditions.

In relation to noise receivers in Wolgan Road, predicted noise emission levels from the Project will meet the noise criteria set out in Angus Place (MP 06_0021) approval under all operating conditions.

In relation to the Springvale noise receivers, modelling shows that noise levels from the Project will meet the Project Specific Noise Criteria in accordance with the INP. For locations S1, S2, S4 and S5 the noise levels predicted for the existing overland conveyor are low when compared to the entire Springvale Coal Mine operation. This means that the noise impact at these receptors will be insignificant in relation to noise from Springvale Coal Mine.

Cumulative Noise Assessment

Potential sources of noise surrounding the Project have been identified as the Wallerawang Power Station, the Mt Piper Power Station, Angus Place Colliery, Springvale Coal; Mine, Blackmans Flat Waste Management Facility and Pine Dale Coal Mine. The predicted cumulative amenity noise levels from existing, approved and proposed mining and industrial noise sources, and the Project are at or below the relevant acceptable amenity levels for suburban receivers at all locations during the daytime period.

During the night period the cumulative amenity noise level exceeds the acceptable level of 40 dBA at Locations B2 and B17, but remains below the maximum noise level of 45 dBA.

Sleep Disturbance Analysis

The results of sleep disturbance modelling indicate that maximum noise levels generated by the Project will comply with sleep disturbance goals at the closest and, potentially most affected receptors in Wallerawang, Lidsdale and Springvale.

Predicted maximum noise levels from the Project at Blackmans Flat and Wolgan Road receptors show potential exceedance of the noise goals, but are below a level that is considered to cause awakening reactions. Mitigation measures considered for operation impacts will also attenuate the maximum noise levels from activities at night.

Construction Noise Assessment

The results of construction modelling indicate that noise emission from construction will comply with the noise affected management level at all residential locations, with the exception of receivers B2, B4 B5 and B6. It should be noted that the predicted construction noise levels are below the *highly noise affected* level for the scenarios considered.

Road Traffic Noise Assessment

The predicted impact from Project related traffic, during construction and operation, due to an increase in road traffic noise from the Castlereagh Highway is considered to be negligible.

Vibration Assessment

Construction blasting noise and vibration impacts have been assessed and a minimum safe blasting distance has been recommended. Monitoring of blasts would be conducted in order to derive a ‘site law’ for the Project to validate predicted vibration levels.

Predicted vibration levels for the construction and operation of the Project are significantly below damage and annoyance risk criteria at all times.

9.5.1.10 Noise Management and Mitigation Measures

Springvale Coal have identified a number of mitigation strategies will be implemented for the Project in order to minimise and manage the potential environmental impacts from the Project. These include:

- Reducing truck movements along the Mt Piper Haul Road during prevailing noise enhancing weather

conditions in order to meet the nominated Project Specific Noise Criteria. The default level will be zero trucking during these prevailing conditions until such time as noise monitoring confirms the truck movements required to meet the Project Specific Noise Criteria during these conditions.

- The Kerosene Vale Stockpile Area will not be operated during evening and night periods.
- Within 6 months of the date of the Project Approval a single Noise Management Plan will be prepared for the entire PAA in consultation with the EPA.
- The Noise Management Plan will include the existing monitoring and mitigation strategies contained in the current approved Angus Place Noise Monitoring program, specifically, quarterly inspections of road surfaces, quarterly attended and unattended monitoring to assess compliance and additional noise monitoring in response to noise complaints.
- The Noise Management Plan will be updated to include a protocol for determining the prevailing noise enhancing weather conditions which would trigger reduced transport on the Mt Piper Haul Road as defined above.
- Prior to construction a Construction Environmental Management Plan (CEMP) will be prepared for the Springvale Coal Services Site that will be implemented during the construction phase and will include a Noise Management Plan;
- Removal of the northern two thirds of the existing Co-Disposal REA at the Springvale Coal Services Site within five years of Project Approval;
- The construction of a fully sealed Link Haul Road in the location as depicted in **Figure 1**;
- Material haulage will be managed to maintain compliance with the approved noise criteria on the private Haul Roads;
- Dust mitigation measures, that also have a direct impact on noise, will be implemented and will be completed prior to operating the new infrastructure and will include enclosure of the existing and proposed Washery; enclosure of conveyor transfer points; loading of coal rejects from an enclosed bin; coal reclaim from stockpiles via underground reclaim tunnel; and three quarter enclosed conveyors.

9.5.1.11 Conclusion

The predicted noise emission levels indicate that many noise receivers modelled will meet the Project Specific Noise Criteria established for the Project. However, the results of the Noise and Vibration Impact Assessment indicate that there will be likely residual noise impacts above the Project Specific Noise Criteria at some of the receptors at Blackmans Flat. Noise mitigation and management measures, as detailed in the Statement of Commitments in Section 10 of the EIS, will be implemented to reduce the impact of the noise emissions from the Project.

9.5.2 Air Quality

9.5.2.1 Introduction

The BBRA for the Project considered that dust impacts were a *moderate risk* and that the existing dust controls operating on coal handling infrastructure, stockpiles and the overall site will be expanded to include the additional infrastructure.

Pacific Environment prepared an Air Quality and Greenhouse Gas Assessment (AQGHGA) for the Project. A copy of the Assessment is contained in **Appendix 3**.

The key air quality issue for mining is the emission of dust and Particulate Matter (PM). Mining generates PM during a number of activities including coal handling, use of heavy vehicles and wind erosion from stockpiles and exposed surfaces. PM is formed when particulate becomes entrained in the atmosphere by the

turbulent action of wind, by the mechanical disturbance of materials, or through the release of particulate-rich gaseous emissions from combustion sources.

Coarse particles (PM 2.5 to 10) are derived primarily from mechanical processes that can result in dust from roads and mining while fine particles ($PM_{2.5}$) are derived primarily from combustion processes such as vehicles emissions, coal burning for power generation and bushfires. Mining dust is likely to be composed of predominantly coarse PM and larger.

The NSW Environmental Protection Authority (EPA) *Approved Methods* specifies air quality assessment criteria relevant for assessing impacts from air pollution. The air quality goals relate to the total dust burden in the air, not just the dust from the Project. Consideration of background dust levels needs to be made when using these goals to assess potential impacts.

Whilst the Director Generals Requirement for the Project specify an assessment of the emissions including $PM_{2.5}$ and PM_{10} emissions, it is noted that the *Ambient Air National Environment Protection Measure* (Air-NEPM) $PM_{2.5}$ advisory reporting standards are not impact assessment criteria. Nevertheless a comparison of $PM_{2.5}$ predictions to these reporting standards are included in the Air Quality report. The following sections provide a summary of the key findings of the Air Quality Impact Assessment. For further details, the full assessment report contained in **Appendix 3** should be referred to.

9.5.2.2 Existing Environment

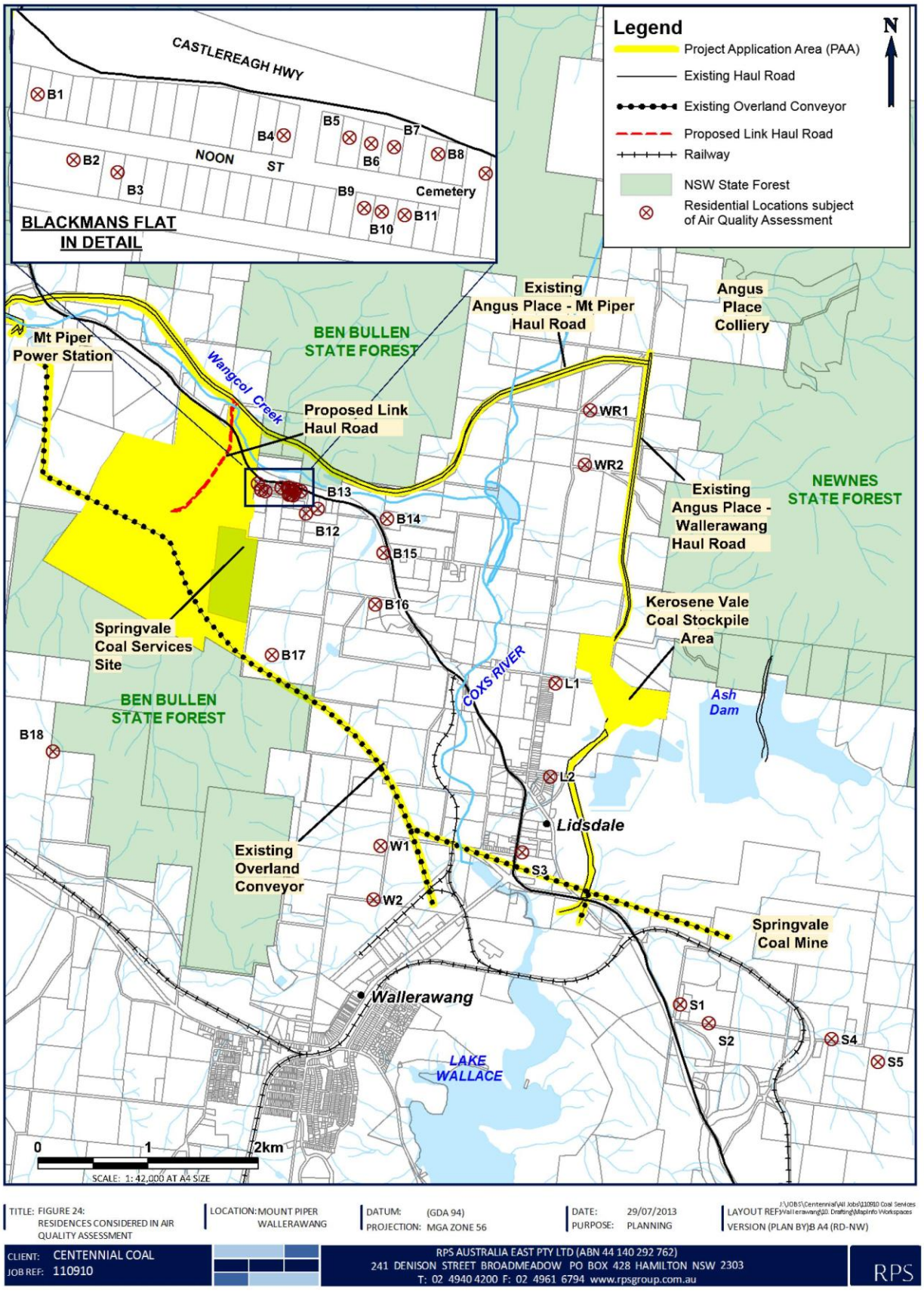
Air quality standards and criteria refer to pollutant levels, including the contribution from specific projects and existing sources of dust. To assess impacts against all relevant air quality standards and criteria, it is necessary to have information or estimates on existing dust concentration and deposition levels in the area to which the Project will likely contribute. It is important to note that the existing air quality conditions, (background conditions), will be influenced by existing mining operations in the area, including the current Springvale Coal Services operations on the site.

Springvale Coal currently operates a monitoring network in the area, which consists of High Volume Air Samplers (HVAS) and dust deposition gauges at the following mine operations:

- Angus Place Colliery – One HVAS and eight dust deposition gauges;
- Pine Dale Mine – One HVAS and three dust deposition gauges;
- Springvale Coal Mine – One HVAS and five dust deposition gauges; and
- Lidsdale Siding – Five dust deposition gauges.

For the purposes of establishing annual background levels at Blackmans Flat (those nearest to the Springvale Coal Services Site), the maximum values at Pine Dale and Angus Place Colliery were taken into account. A plan showing the location of the residences considered in the Air Quality Assessment is provided in **Figure 24**. HVAS and dust deposition gauges receptors are located within Blackmans Flat / Pine Dale immediately adjacent to the eastern boundary of the Springvale Coal Services Site, and in the vicinities of Angus Place Colliery, Springvale Coal Mine and Lidsdale Siding.

Figure 24 Residences Considered in Air Quality Assessment



The dominant source of PM_{10} concentrations at that location will be the existing operations in the area including, the Springvale Coal Services Site, haulage from Angus Place Colliery and the proposed Neubeck Open Cut, as well as more distant sources which have been included in the cumulative modelling scenarios. The monitoring data at Angus Place Colliery will likely be more indicative of contributions from non-modelled sources, and therefore, more representative of background levels. The highest annual average PM_{10} value for Angus Place Colliery was measured to be 7 $\mu g/m^3$. To remain conservative an intermediate value of approximately 10 $\mu g/m^3$ is used to represent the background PM_{10} concentrations. Similarly, a value of 27 $\mu g/m^3$ has been used to represent existing Total Suspended Particulates (TSP) concentrations and a value of 1.4 g/m^2/month was chosen to represent background dust deposition levels in the area.

Estimating the annual average background value for $PM_{2.5}$ is more difficult as there are no direct measurements in the immediate area. Data from a number of NSW EPA sites with co located PM_{10} and $PM_{2.5}$ measurements in 2011, was analysed by the AQGHGA for annual average and these values show a relationship between the two particle size groups. The annual average PM_{10} concentration for Bathurst in 2011 (at the NSW EPA TEOM site) was 11.0 µg/m3. Applying the same regression function to the Bathurst data gives an estimated annual average $PM_{2.5}$ concentration of approximately 4.0 µg/m3. This value has been used to represent the annual average $PM_{2.5}$ background for the assessment.

In summary, conservative estimates of background dust levels for the site are estimated to be as follows:

- 27 $\mu g/m^3$ for annual average TSP;
- 10 $\mu g/m^3$ for annual average PM_{10}; and
- 1.4 g/m^2/month for annual average dust deposition.

According to the Air Quality Impact Assessment emissions from the current operations are well within the recommended air quality standards.

9.5.2.3 Air Quality Impact Assessment

The Air Quality Impact Assessment has generally followed the EPA's *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods). The Approved Methods specify how assessment based on the use of air dispersion models should be completed. They include guidelines for the preparation of meteorological data to be used in dispersion models and the relevant air quality criteria for assessing the significance of predicted concentration and deposition rates.

The approach taken in this Assessment generally follows the guidelines with the only deviation relating to the model used being the ISCMOD. This model has been accepted for use in NSW by the EPA including for mines in the Hunter Valley. The modelling has been based on the use of three particle-size categories (0 to 2.5 ugm referred to as FP; 2.5 to 10 ugm referred to as CM (coarse matter); and 10 to 30 um referred to as the 'Rest)'. The distribution of particles in each particle size range as a percentage of Total Suspended Particulate is as follows:

- $PM_{2.5}$ (FP) is 4.7% of TSP;
- $PM_{2.5}$ to PM_{10} (CM) is 34.4% of TSP; and
- PM_{10} to 30 (Rest) is 60.9 of TSP.

Modelling was done using three source groups. Each group corresponded to a particle size category. Each source in the group was assumed to emit at the full TSP emission rate and to deposit from the plume in accordance with the deposition rate appropriate for particles with an aerodynamic diameter equal to the geometric mean of the limits of the particle size range, except for the $PM_{2.5}$ group, which was assumed to have a particle size of 1 µm.

The predicted concentration in the output files for each group were then combined according to the weightings in the dot points above to determine the concentration of $PM_{2.5}$, PM_{10} and TSP. For example, using the naming convention of the source groups listed above, TSP = FP + CM + Rest, PM_{10} = FP + CM and $PM_{2.5}$ = FP.

The model has the capacity to take into account dust emissions that vary in time or weather conditions. This has proved particularly useful for simulating emissions on mining operations where wind speed is a significant factor in determining the rate at which dust is generated.

For the Assessment, the operations were represented by a series of volume sources located according to the location of activities. Estimates of emissions for each source were developed on an hourly time step taking into account the activities that would take place at that location. Thus, for each source, for each hour, an emission rate was determined which depended upon the level of activity and the wind speed. It is important to do this in the model to ensure that long-term average emission rates are not combined with worst-case dispersion conditions, which are associated with light winds. Light winds at the Springvale Coal Services Site would correspond with periods of low dust generation (because wind erosion and other wind-dependent emissions rates will be low) and also correspond with periods of poor dispersion. If these measures are not taken then the model has the potential to significantly overstate impacts.

The operation of the Project has been analysed and estimates of dust emissions for the key dust generating activities have been made for each of the scenarios listed below. Emission factors developed both locally and by the US EPA have been applied to estimate the amount of dust produced by each activity. The selected scenarios are considered worst case with respect to dust generation as there is the assumption that each transport mode (conveyor or private haul road) is used at its full capacity for a full 12 months. In the case of the private haul roads, it is highly unlikely that all Angus Place Colliery production is sent to Wallerawang Power Station, Mt Piper Power Station or Springvale Coal Services Site exclusively for a full 12 month period.

- Scenario 1a – Springvale Coal Services Site operations only. A maximum of 6 Mtpa of total material being hauled on the new internal link road utilising the eastern route, as defined in **Figure 22**, refer to Section 8.1.1;
- Scenario 1b – as for Scenario 1a but utilising the western haul road route, as defined in **Figure 22**, refer to Section 8.1.1;
- Scenario 2a – Cumulative assessment including operations at the Springvale Coal Services Site, Angus Place Colliery, Springvale Coal Mine, operations, haulage at Neubecks, haulage of 4Mtpa of coal from Angus Place Colliery to Mt Piper Power Station, and use of the preferred Link Haul Road, as defined in **Figure 22**;
- Scenario 2b – as for Scenario 2a, but with the western haul road route as defined in **Figure 22**, refer to Section 8.1.1; and
- Scenario 2c – as for Scenario 2b but hauling all Angus Place coal to Wallerawang Power Station rather than Mt Piper Power Station.

The air quality assessment criteria for the Project are as follows:

- 50 $\mu g/m^3$ for 24 hour average PM_{10} for the Project and other sources (excluding natural events);
- 30 $\mu g/m^3$ for annual average PM_{10} for the Project and other sources;
- 90 $\mu g/m^3$ for annual average TSP concentrations due to the Project alone and other sources;
- 2 g/m^2/month for annual average dust deposition due to the Project alone; and
- 4 g/m^2/month for annual average predicted cumulative deposition due to the Project and other sources.

Scenarios 2a, 2b and 2c – all operations

Table 37, **Table 38** and **Table 39** present the predicted annual averages for Scenarios 2a, 2b and 2c at each of the nearest dwellings at Blackmans Flat, Lidsdale and Wolgan Road.

Table 37 Predicted annual average for Scenario 2a

Residence ID	Annual $PM_{2.5}$ ($\mu g/m^3$)	Annual PM_{10} ($\mu g/m^3$)	Annual TSP ($\mu g/m^3$)	Dust deposition (g/m^2/month)
Scenario 2a				
B1	1.5	11.4	18.6	1.0
B2	1.4	10.2	15.5	0.8
B3	1.3	9.7	14.4	0.7
B4	1.2	9.1	13.0	0.6
B5	1.2	9.0	12.7	0.6
B6	1.2	9.0	12.6	0.6
B7	1.2	8.9	12.5	0.6
B8	1.2	8.9	12.4	0.6
B9	1.2	9.0	12.2	0.6
B10	1.2	8.9	12.1	0.6
B11	1.2	8.9	12.1	0.5
L1	1.1	7.7	9.1	0.2
L2	0.8	5.4	5.9	0.1
S1	0.4	2.9	3.2	0.1
S2	0.5	3.3	3.6	0.1
S3	0.5	3.6	3.9	0.1
S4	0.5	3.4	3.8	0.1
S5	0.5	3.1	3.3	0.1
WR1	0.9	6.8	8.4	0.3
WR2	0.9	6.0	6.8	0.2

Table 38 Predicted annual average for Scenario 2b

Residence ID	Annual $PM_{2.5}$ ($\mu g/m^3$)	Annual PM_{10} ($\mu g/m^3$)	Annual TSP ($\mu g/m^3$)	Dust deposition (g/m^2/month)
Scenario 2b				
B1	1.1	8.3	12.2	0.6
B2	1.1	8.1	11.7	0.6
B3	1.1	8.1	11.5	0.6
B4	1.1	8.1	11.3	0.5
B5	1.1	8.2	11.4	0.5
B6	1.1	8.2	11.4	0.5
B7	1.1	8.2	11.4	0.5
B8	1.1	8.3	11.5	0.5
B9	1.1	8.3	11.1	0.5
B10	1.1	8.2	11.1	0.5
B11	1.1	8.3	11.1	0.5
L1	1.1	7.7	9.1	0.2
L2	0.8	5.4	5.9	0.1
S1	0.4	2.9	3.2	0.1
S2	0.5	3.2	3.6	0.1
S3	0.5	3.6	3.9	0.1
S4	0.5	3.4	3.8	0.1
S5	0.5	3.1	3.3	0.1
WR1	0.9	6.8	8.4	0.3
WR2	0.9	6.0	6.8	0.2

Table 39 Predicted annual average for Scenario 2c

Residence ID	Annual $PM_{2.5}$ ($\mu g/m^3$)	Annual PM_{10} ($\mu g/m^3$)	Annual TSP ($\mu g/m^3$)	Dust deposition (g/m^2/month)
Scenario 2c				
B1	0.9	6.5	9.8	0.5
B2	0.9	6.5	9.5	0.5
B3	0.9	6.4	9.2	0.5
B4	0.8	5.9	8.1	0.4
B5	0.8	5.8	7.8	0.4
B6	0.8	5.7	7.7	0.4
B7	0.8	5.7	7.6	0.4
B8	0.8	5.6	7.4	0.4
B9	0.8	6.0	7.9	0.4
B10	0.8	5.9	7.8	0.4
B11	0.8	5.9	7.7	0.4
L1	1.1	7.7	9.4	0.3
L2	1.1	8.0	10.6	0.3
S1	0.5	3.4	3.9	0.1
S2	0.5	3.7	4.1	0.1
S3	0.7	4.7	5.5	0.1
S4	0.6	3.8	4.2	0.1
S5	0.5	3.3	3.6	0.1
WR1	0.6	4.4	5.6	0.2
WR2	0.6	4.4	5.3	0.1

It can be seen that by removing a significant load from the internal haul route (compare Scenario 2a, **Table 37** with Scenario 2b, **Table 38**), the concentrations at some of the Blackmans Flat residences are reduced. Levels at the residences further along the Castlereagh Highway to the east are slightly higher, but still remain below their respective goals.

The results also show that the levels at Blackmans Flat are also slightly further reduced when the Angus Place coal is hauled to Wallerawang rather than Mt Piper Power Station (compare Scenario 2b, **Table 38** and Scenario 2c, **Table 39**). Levels at the Lidsdale Village residences are higher for this option, but still remain below their respective goals.

Levels at the Wolgan Road residences are predicted to be slightly lower for this option. Given that these residences are near both the Wallerawang and Mt Piper haul roads, they would be expected to be similar. The slightly higher levels at these locations for Scenario 2a and 2b, are likely to be a result of the predominant north-westerlies blowing from the Mt Piper Haul Road towards Wolgan Road.

It should also be noted that the predicted annual average PM_{10} concentrations at Residence L1 remain relatively unchanged between each of the three Scenarios 2a, 2b and 2c. This is not unexpected given its close proximity to Kerosene Vale. The results indicate that the dominant dust sources for that location are operations at Kerosene Vale and that traffic on the Wallerawang haul road has little impact on predicted ground level concentrations there. Levels at L1 are still predicted to remain below their respective air quality goals, even when including highly conservative background values.

It is also clear that the western haul road option (Scenario 2a utilising the preferred Link Haul Road as defined in **Figure 22**) would be the preferred option in terms of air quality at Blackmans Flat.

24 Hour average PM_{10} and $PM_{2.5}$ concentrations

Predictions of maximum 24-hour average PM_{10} and $PM_{2.5}$ concentrations have been made for each of the nearest representative receptors, as previously identified. The results are listed in **Table 40**.

It can be seen that the only two residences predicted to exceed the PM_{10} 50 µg/m3 criterion are WR1 and WR2. These exceed for both haul road scenarios, but the magnitude of the exceedances are lower for the Wallerawang haul road option (Scenario 2c). However, it should be noted that these predictions are highly conservative and it is unlikely that the full 4 Mtpa will be hauled along either roadway to the exclusion of the other. Rather, the load would be shared between the two haul routes.

Table 40 Predicted Maximum 24-hour Average PM_{10} and $PM_{2.5}$ Concentrations (µg/m^3)

Residence ID	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b	Scenario 2c
PM_{10} (µg/m^3)					
B1	34.8	21.6	30.2	24.2	20.0
B2	30.7	21.4	26.8	22.8	20.2
B3	28.8	20.9	25.9	22.4	19.8
B4	23.1	17.6	32.0	30.7	16.9
B5	21.6	16.8	39.8	38.7	16.5
B6	21.2	16.7	42.5	41.5	16.5
B7	20.7	16.5	44.7	43.8	16.5
B8	20.3	16.3	45.0	44.2	16.4
B9	23.3	18.7	41.2	40.4	18.0
B10	22.9	18.4	41.6	40.8	17.9
B11	22.6	18.3	41.5	40.7	17.8
L1	14.2	14.0	23.2	23.1	29.0
L2	13.6	13.5	22.7	22.7	31.0
S1	5.7	5.6	40.6	40.6	41.1
S2	5.5	5.4	47.0	46.9	47.4
S3	8.8	8.7	19.0	19.0	28.6
S4	5.7	5.6	13.0	13.0	13.6
S5	5.5	5.5	11.4	11.4	11.9
WR1	4.6	4.6	**92.6**	**92.6**	**63.6**
WR2	6.4	6.2	**72.4**	**72.4**	**64.8**
$PM_{2.5}$ (µg/m^3)					
B1	4.4	2.7	3.9	3.2	2.5
B2	3.9	2.7	3.4	2.9	2.6
B3	3.7	2.7	3.3	2.9	2.5
B4	2.9	2.2	4.2	4.0	2.2
B5	2.7	2.1	5.2	5.1	2.2
B6	2.7	2.1	5.6	5.5	2.2
B7	2.6	2.1	5.9	5.8	2.2
B8	2.6	2.1	5.9	5.8	2.1
B9	2.9	2.4	5.5	5.4	2.4

Residence ID	Scenario 1a	Scenario 1b	Scenario 2a	Scenario 2b	Scenario 2c
B10	2.9	2.3	5.5	5.4	2.3
B11	2.8	2.3	5.5	5.4	2.3
L1	2.0	1.9	3.8	3.8	6.1
L2	1.9	1.9	3.8	3.8	5.3
S1	0.9	0.9	6.3	6.3	6.3
S2	0.8	0.8	7.3	7.3	7.4
S3	1.2	1.2	3.6	3.6	5.7
S4	0.9	0.9	1.9	1.9	2.0
S5	0.9	0.9	1.7	1.7	1.8
WR1	0.6	0.6	14.3	14.3	10.2
WR2	0.9	0.9	12.8	12.8	11.6

Further analysis was carried out on the two Wolgan Road residences to determine how often the 50 µg/m^3 level was exceeded on an annual basis. Levels above 50 µg/m^3 are not predicted to occur frequently, but are likely on two occasions in the year. On these two days winds travelled from either the Mt Piper Haul Road or the Angus Place surface facilities towards the residences. Given that these models use worst-case scenarios, yet still result in only a small number of predicted exceedances, effective management strategies can be easily implemented. For the majority of the year, the levels at these residences are predicted to be below 10 µg/m^3. **Figure 25** and **Figure 26** are graphs of the predicted maximum 24-Hour average PM_{10} concentrations and predicted maximum 24-Hour average $PM_{2.5}$ concentrations at the two locations on an annual basis.

Figure 25 Time Series of Predicted 24 hour average PM_{10} Concentrations at WR1 and WR2

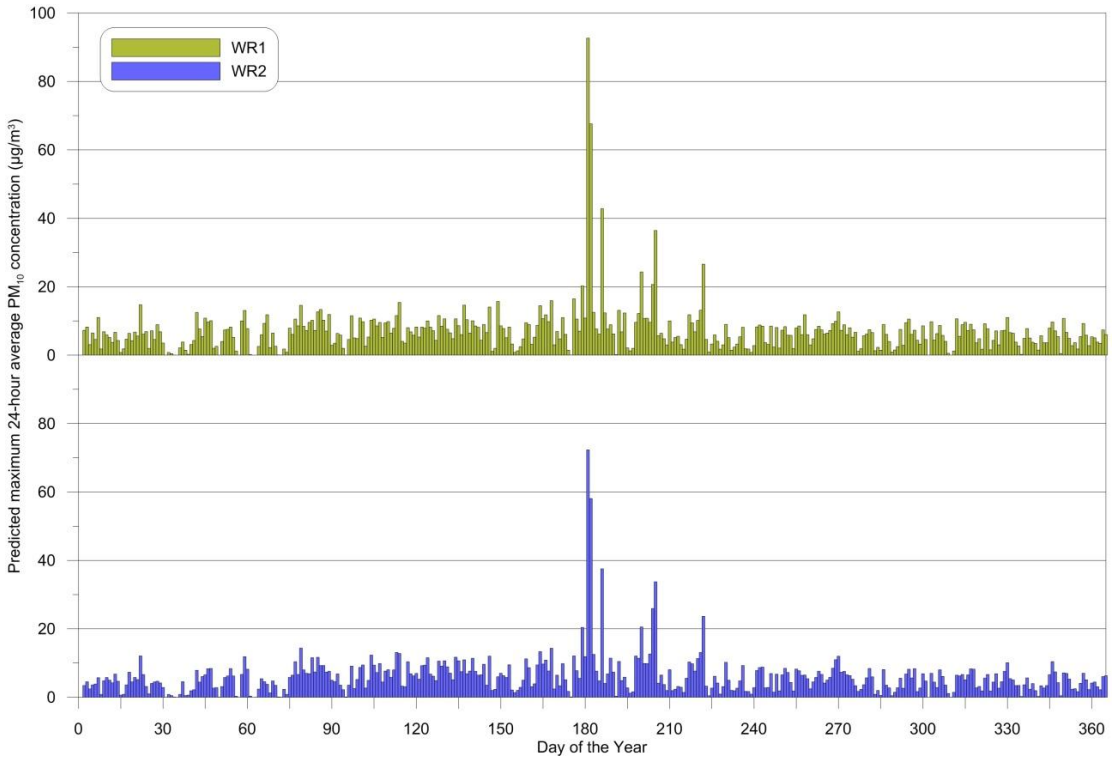
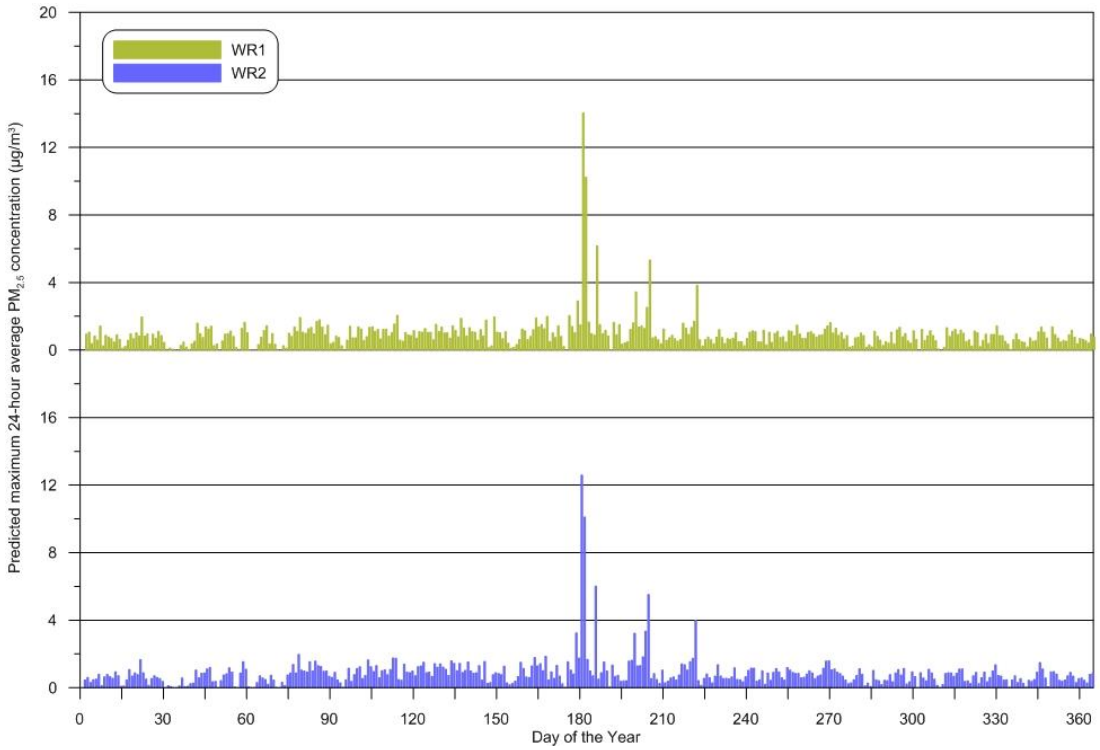


Figure 26 Time Series of Predicted 24 hour average $PM_{2.5}$ Concentrations at WR1 and WR2



$PM_{2.5}$ Assessment

In December 2000, the National Environment Protection Council (NEPC) initiated a review to determine whether a national ambient air quality criterion for $PM_{2.5}$ was required in Australia, and the feasibility of developing such a criterion. The review found that:

- There are health effects associated with these fine particles;
- The health effects observed overseas are supported by Australian studies; and
- Fine particle standards have been set in Canada and the USA, and an interim criterion is proposed for New Zealand.

The review concluded that there is sufficient community concern regarding $PM_{2.5}$ to consider it an entity separate from PM_{10}. As such, in July 2003, a variation to the Ambient Air Quality NEPM was made to extend its coverage to $PM_{2.5}$, setting the following Interim Advisory Reporting Standards for $PM_{2.5}$:

- A 24-hour average concentration of 25 µg/m3; and
- An annual average concentration of 8 µg/m3.

The Air Quality Impact Assessment notes that the Interim Advisory Reporting Standards relating to $PM_{2.5}$ are reporting guidelines only and are not intended to represent air quality criteria. Nevertheless the Air Quality Impact Assessment carried out predictions for $PM_{2.5}$ and the full results can be viewed in **Appendix 3.**

In summary the predicted maximum 24-hour average $PM_{2.5}$ concentrations at nearest residences under all Scenarios, as defined in Section 9.5.2.3, range from 0.6 µg/m^3 to 14.3 µg/m^3 and are therefore well below the Interim Advisory Reporting Standard of 25 µg/m^3.

The predicted annual average $PM_{2.5}$ concentrations at nearest residences under all Scenarios, as defined in Section 9.5.2.3, range from 0.4 µg/m^3 to 1.5 µg/m^3 and are therefore well below the Interim Advisory Reporting Standard of 8 µg/m^3.

9.5.2.4 Consequences of Impact

The results of the Air Quality Impact Assessment have shown that the proposed activities for the Project at Blackmans Flat and Lidsdale will not result in an exceedance of the air pollutant goals presented in Section 9.5.2.3. Therefore there would be no significant consequences arising from the Project.

However the worst case scenarios for the two Wolgan Road residences show that the 50 µg/m^3 criterion for 24-hour average PM_{10} concentrations will be exceeded on two occasions each year. Given the small number of predicted exceedances these are able to be effectively managed.

9.5.2.5 Air Quality Management and Mitigation Measures

The Springvale Coal Services PRP, submitted in September 2012, indicated a number of measures that may potentially be applied at the Site (Centennial Coal, 2012). **Table 41** provides a summary of these measures and the status of investigation and implementation. The current mitigation measures include:

- Enclosure of the existing and proposed Washery;
- Enclosure of conveyor transfer points;
- Loading of coal rejects from an enclosed bin;
- Majority of coal reclaimed from stockpiles via underground reclaim tunnel;
- Three quarter enclosed conveyors;
- Stockpile water sprays which are wind activated;
- New Link Haul Road to be fully sealed;
- Regular use of water carts on unsealed roads trafficked by heavy vehicles. This will include the surface of the proposed REA; and
- Installation of a tapered element oscillating microbalance (TEOM) continuous atmospheric dust monitoring unit within the Blackmans Flat residential area.

It was concluded that Springvale Coal Services would initially perform the relevant analysis required to determine the Dust Extinction Moisture (DEM) levels of ROM and product coal. Wind tunnel testing will also be undertaken to determine the wind speeds required to initiate wind erosion. This will provide more accuracy than using generic emission factors and will help to target any additional mitigation strategies.

Table 41 provides an overview of the best practice air quality mitigation measures relevant to the Project.

Table 41 Overview of Best Practice Emission Reduction Measures Described in Katestone (2011)

Air Quality Emission Source	Emission Reduction Measure	Used for the Project?	Comments	Effectiveness of reduction in Emissions Inventory
Haul Trucks travelling on Unpaved Roads (this activity is limited to haulage of rejects to the emplacement areas)	Use of water carts to control emissions	Yes	Watering of unsealed roads trafficked by heavy vehicles and the surface of the REA is assumed.	The proposed Link Haul Road will be sealed. Level 2 watering will achieve a reduction of at least 75% of annual emissions. However given the low usage of unsealed roads trafficked by heavy vehicles the net benefit would be negligible.
	Control of the speed of trucks	Yes	Speed controlled to approximately 40 kilometres per hour (kph).	The emission factor is based upon amount of material moved, so this would make no reduction to the emissions inventory. However, there would be a marginal reduction in practice.
	Largest practical truck size	Yes	Based on the amount of material being moved and the limitations on physical dimensions of vehicles used, Springvale Coal has given the largest economic and practical size haul trucks for assessment.	Emission factor partially based on size of truck. A smaller sized truck will give a higher estimate of TSP emissions per year for hauling activities.
Wind Erosion of Exposed Materials and Stockpiles	Use of water carts to control emissions	Yes	Water carts used on exposed areas.	50%
ROM Coal Handling	Water application	Yes	Water sprays used at the ROM hopper	50%
	Minimisation of drop heights	No	Coal is delivered by conveyor and dropped from an elevated conveyor gantry	Emission factor does not consider the drop height, so this would present no reduction to the emissions inventory. However, there would be a material reduction in practice.
ROM Coal Stockpile	Water application	Yes	Dust suppression sprays are installed on the conveyor gantry.	N/A
	Enclosure of ROM coal stockpile	No	This is not considered to be practical by Springvale Coal.	Dozers infrequently push coal outside the area of the stockpile sprays. This will be rectified with the new upgrade facility which includes a separate truck dump station and conveyor system leading to the ROM coal stockpile.
Bulldozing	Watering of trafficked areas	No	Currently no watering of material where dozers operate.	Under further investigation and based on the results of the DEM testing, further controls may be implemented.

Air Quality Emission Source	Emission Reduction Measure	Used for the Project?	Comments	Effectiveness of reduction in Emissions Inventory
	Minimisation of travel speed and distance travelled.	No	Springvale Coal will undertake an education campaign with contracted dozer operators to ensure appropriate speeds and routes are used.	Emission factor based on hours used, so this would provide no reduction to the emissions inventory. However, there would be a marginal reduction in practice.

9.5.2.6 Conclusion

The Air Quality Assessment conducted by Pacific Environment modelled off-site dust concentration and dust deposition levels caused by dust generating activities likely to result from the Project. Emissions inventories were developed for two scenarios, each with two internal haul road options.

It is clear that Link Haul Road (Option 2) as defined in **Figure 22** is the preferred option in terms of air quality at Blackmans Flat.

Detailed modelling was conducted to assess whether the Project would adversely impact any privately owned residencies located within the vicinity of the PAA. The assessment included predictions of air quality impacts from the Project in isolation as well as the potential cumulative impacts of other sources. The modelling indicates that the nearest sensitive receptors at Blackmans Flat are unlikely to experience dust concentrations above the EPA's air quality assessment criteria. A number of potential dust mitigation measures have been identified that could be implemented to further reduce emissions.

Dust mitigation measures will be implemented, as described in Section 9.5.2.5 and will be completed prior to operating the new infrastructure and furthermore within 6 months of the date of the Project Approval, an updated Air Quality Management Plan will be prepared for the entire PAA. The plan will be prepared in consultation with the EPA.

Generally, the predictions presented in the Air Quality Assessment and the EIS incorporate a level of conservatism due to both worst-case assumptions and the nature of dispersion modelling. As a result, it is expected that actual ground level concentrations would be lower than those predicted in the model during normal operation of the Project. Notwithstanding this, it is proposed that the worst-case impacts would be managed on a day-to-day basis.

9.5.3 Surface Water

9.5.3.1 Introduction

The BBRA for the Project considered that the management of the surface water at the Springvale Coal Services Site was a moderate risk and that additional water management and pollution control studies would be required. Water management for the existing private haul roads, overland conveyor system and the Kerosene Vale coal storage area were considered a low risk.

The Springvale Coal Services Site has a long mining history involving underground and open cut mining for over 70 years with coal processing and reject disposal activities for in excess of 40 years. This has created a situation where existing pollution control systems have been required to be progressively retrofitted over recent years.

The fundamental issues relate to historic mining activities which did not provide for adequate separation of clean water from upstream areas and sufficient containment of runoff from disturbed areas. This was compounded by the lack of process water recycling leading to the need to abstract water from dams

containing a mixture of clean water runoff from upstream areas and dirty water from disturbed areas. Some of these disturbed areas yielded poor water quality and acid generated from coal reject produced from the original Western Main and Eastern Main underground mines. The end result was a highly variable water quality leaving the site.

A SWMP for the Springvale Coal Services Site was developed by GHD in accordance with project approval conditions (PA06_0017) in May 2006. This was subsequently modified (again by GHD) under approval (PA06_0017 MOD1) in September 2008. This Plan was subsequently revised in March 2012. Each reiteration of the plan has been prepared in consultation with the EPA and has resulted in progressive improvements in water quality leaving the site.

The layout of the existing water management structures and the location of the LDP 006 are shown on **Figure 27.** The existing Washery, coal storage areas, the Co-Disposal REA, old open cut areas and internal access roads all lie within the valley of the Lamberts Gully drainage line. Above these areas is a relatively undisturbed catchment of approximately 239 ha within Ben Bullen State Forest. The undisturbed catchment above the Springvale Coal Services Site include steep slopes which generate large volumes of clean runoff during heavy rain events but is insufficient to have a permanent flow. There are several smaller sub-catchments within the Lamberts Gully drainage line which are partly disturbed and undisturbed. All these areas ultimately drain to LDP 006 near the front entrance of the Springvale Coal Services Site before discharging into Wangcol Creek.

Improvements in the water management plan at the Springvale Coal Services Site over the past 10 years have included:

- Installation of limestone weirs along the drainage lines to raise pH and reduce sediment load while rehabilitation works were undertaken. The low pH was a result of coal reject produced from the original Western Main Colliery, which was higher in sulphur content than the current production from Springvale Coal Mine. This higher sulphur content resulted in acid generation. However, its subsequent removal eliminated this problem;
- Removal of all coal reject from the access roads and exposed emplacements that had acid generating potential. Once this was completed, the limestone weirs were no longer required and were removed;
- Rehabilitation of areas adjacent to the main access roads that originally drained offsite;
- Upgrade of the pollution control ponds below both the export stockpile and Washery areas;
- Construction of the two main process water dams, referred to as DML and Cooks Dams. These now provide the main storage of process water and were constructed during an earlier open cut operation;
- Provision of a pipe and pumping system between Cooks and DML Dams to manage stored water for the processing system and maintain freeboard for storm events;
- Provision of a pipe and pumping system to enable the contained water to be recycled back to the Washery via the Cooks Dam or process water supply tanks;
- Improved treatment of water entering the Conveyor Dam from both the rehabilitating open cut area and clean water entering the site by the addition of a flocculation system; and
- Stabilisation of drainage lines and spillways of both the Conveyor Dam and Retention Dam which reduce the solids loading leaving the site during high rainfall events by reducing erosion potential.

The above activities have resulted in improvements in water quality leaving the Springvale Coal Services Site. As part of this Project, the existing SWMP will be revised to include the proposed infrastructure upgrade and new REA. The Revised SWMP will include:

- Provision of a belt press filter to dewater tailings from the Washery. This will result in improved water recycling from the new facility;

- Provision of additional pollution control storage to cater for the new REA. This pond has been sized at 15 Ml and will be linked to the Washery pond to enable recycling into the process water circuit;
- Rehabilitation of the remaining disturbed areas not required for the ongoing operation as shown on **Figure 12**. This plan shows the Year 5 rehabilitation commitment which identifies areas within the Lamberts Gully drainage line that will be maintained as clean catchments;
- Establishing a new LDP at the spillway of Cooks Dam with the existing LDP006 being converted to a monitoring point in consultation with the EPA;
- Provide for the progressive and improved separation of in channel storages (Cooks Dam and Retention Dam) from the Lamberts Gully drainage line in accordance with the Rehabilitation Plan and licensing requirements. This will occur once water quality data confirms that the quality of water is equivalent to that which enters the site from the Ben Bullen State Forest; and
- Continuation of the monitoring program for Wangcol Creek including water quality analysis and aquatic ecology assessments in accordance with Australian and New Zealand Environment Conservation Council (ANZECC) guidelines.

This work will provide progressive improvements in water quality by ensuring that clean water from above the Springvale Coal Services Site ultimately leaves the site in the same condition while reducing the volume of process water discharges by increasing water recycling, storage capacity and management. The Project will also result in a greater demand for water which will also assist in reducing process water discharges.

Although it is not possible to make the process water circuit nil discharge, the proposed water management system will result in some process water deficits in dry years. This will be satisfied by water supplied from the Springvale Mine via a pipeline mounted on the overland conveyor structure.

9.5.3.2 Scope of Water Management Studies

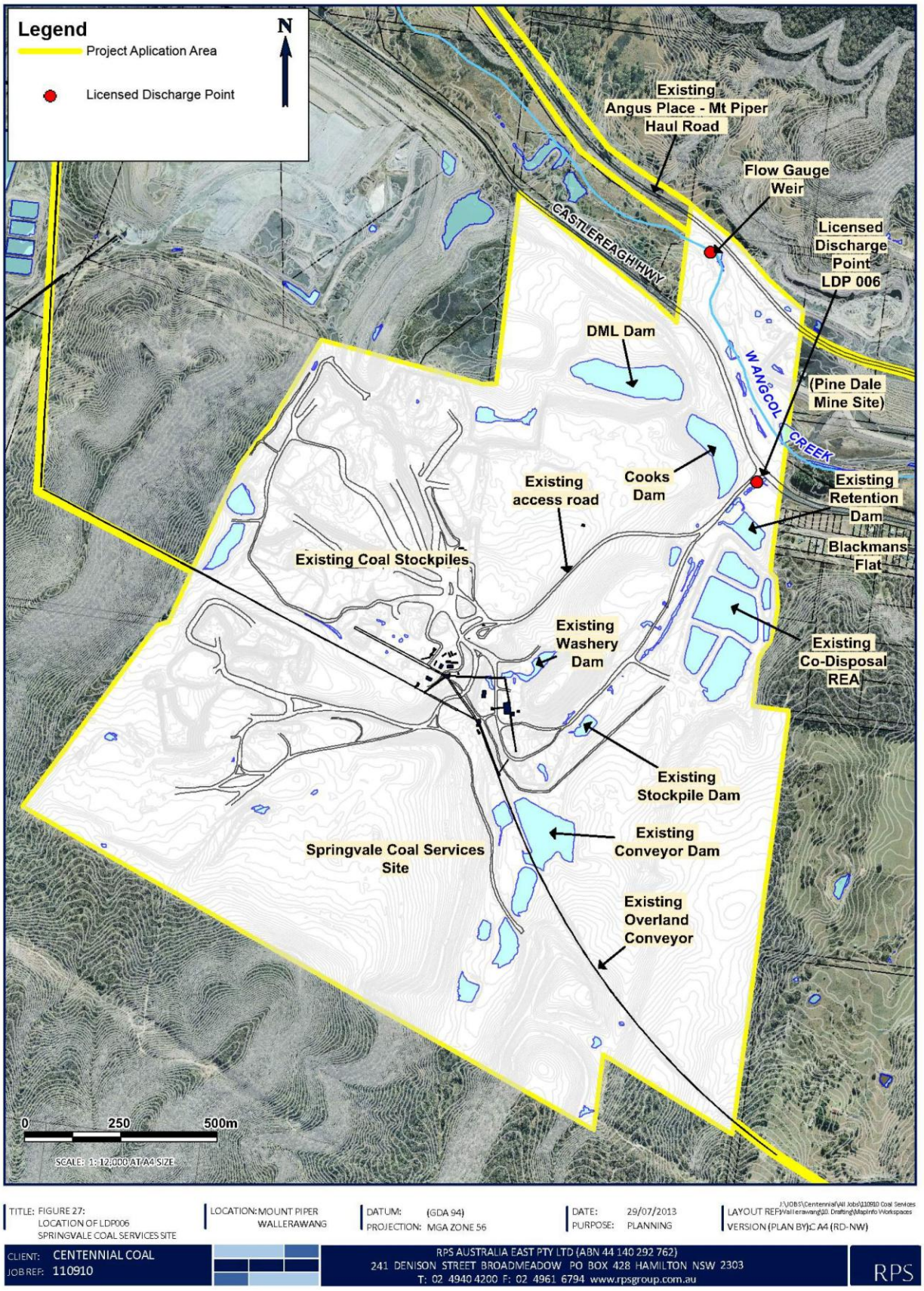
To adequately assess the water management issues relevant to the Springvale Coal Services Site a combination of surface and groundwater studies, aquatic ecology and geomorphological studies is required. These studies built on the existing data base for the site which allowed for verification of the modelling and assessment outcomes.

RPS Aquaterra was engaged to undertake a Water Balance and Surface Water Impact Assessment as well as a Groundwater Assessment, while Marine Pollution Research was commissioned to undertake an Aquatic Ecology Assessment and GHD was commissioned to undertake a Geomorphology Assessment. A copy of each of these assessments is contained in **Appendix 4** (Water Balance and Surface Impact Assessment), **Appendix 5** (Geomorphology Assessment), **Appendix 6** (Groundwater Assessment) and **Appendix 9** (Aquatic Ecology Assessment). These assessments refer extensively to previous studies undertaken by GHD including the current SWMP 2013, Mixing Zone Assessment 2012 and the Water Quality LDP 006 ANZECC Assessment 2012.

The following tasks were carried out as part of the completion of the Water Balance and Surface Water Impact Assessment for the Springvale Coal Services Site:

- A review of existing reports and assessments relevant to surface water;
- A compilation of existing surface water demand data for both the existing operation and proposed future upgrade;
- A surface water management assessment, including rainfall-runoff modelling and flood peak analysis to reflect the changes on the REAs and haul road routes, soil loss and sediment transportation calculations, and sediment pond size evaluation to account for the foreseen changes in the local drainage;

Figure 27 Plan Showing Location of LDP006, Wangcol Creek



- A site water balance, implementing the latest configuration of the upgraded washing facility, notably the inclusion of the belt press filter, which increases the water recycling capacity, as well as the site runoff input;
- A review of the existing surface water quality data for the site and provision of an assessment in terms of the ANZECC/ARMCANZ (2000) guidelines and/or site-specific trigger values;
- An assessment of the impacts of the existing and proposed project on surface waters;
- Advice on the adequacy of any existing and proposed surface water related monitoring; and
- A review of the adequacy of existing and proposed pollution control structures and assess the need for additional facilities.

The Groundwater Assessment, which is discussed further in Section 9.5.4 of the EIS, included modelling of the anticipated groundwater inflow into Cooks and DML Dams which was then used in the Water Balance and Surface Water Assessment. The water balance model was verified by comparing modelled output versus long-term discharge from the site, data from the NOW flow gauge in Wangcol Creek and rainfall data. The verification process concluded that the model can accurately estimate water make from the site during all rainfall events.

9.5.3.3 Existing Environment

The Springvale Coal Services Site drains to LDP 006, which is located in the north-east corner of the Springvale Coal Services Sites in Lamberts Gully just before it joins Wangcol Creek. A plan of the site showing the location of LDP 006, Wangcol Creek and other features is found at **Figure 27**.

Wangcol Creek is a perennial stream and joins the Coxs River, north of Lidsdale at 'Blue Lake', which is an old open cut void. A portion of Wangcol Creek lies nearby the Castlereagh Highway and its condition in the river valley varies from partly vegetated to cleared and degraded land.

Historically, it is considered that Wangcol Creek is intermittent, that is, would generally flow in response to rainfall. Flows are now influenced by Pine Dale Coal Mine, Springvale Coal Services Site and Mount Piper Power Station discharges under licence conditions. This has created a more constant flow.

A number of smaller tributaries enter Wangcol Creek, which have headwaters in either cleared land, mining areas, or the Ben Bullen State Forest. Wangcol Creek is heavily influenced by mining operations with some cleared agricultural land and small sections of state forest in a portion of the upper catchment area.

Across the majority of the Springvale Coal Services Site, natural drainage flows in a north-easterly direction from Ben Bullen State Forest towards Wangcol Creek. Two major drainage lines exist, referred to as Huon Gully (west side of site) and Lamberts Gully (east side of site). The headwaters of these drainage lines are in undisturbed forest, however as they run through the site, some disturbance and diversion has been undertaken to reduce the contamination of these watercourses before reaching Wangcol Creek. The Huon Gully flow ends in the Huon Dam located on Mount Piper Power Station land. This dam was formed by an old open cut dating back to the early 1970's and is understood does not discharge due to the size of the void.

The Lamberts Gully has traditionally flowed through the Springvale Coal Services Site and passes through two sediment control dams, referred to as the Conveyor Dam and the Retention Dam as shown in **Figure 27**. The Lamberts Gully drainage line was subject to open cut extraction in the 1950's and air photos show the Conveyor Dam being in place in 1974 when it was used as a water supply dam for the Washery which serviced Western Main and Eastern Main underground mines. The Retention Dam was constructed in 1996 as part of the development of the Co-Disposal REA. Both dams allow throughput of water after sediment settling. To assist with sediment removal, the Conveyor dam is equipped with a flocculation system.

The main settlement dams are referred to as the Washery Dam which controls runoff from the processing area, the Stockpile Dam which controls runoff from the coal storage area and the DML and Cooks Dams. The DML and Cooks Dams are located near the main site entrance and contain runoff from old open cut area, excess water pumped from the main settlement dams and some groundwater inflow from the old underground workings. The DML and Cooks Dams were formed by a previous open cut and are purpose built pollution control storages. They are used as the main water supply dams for the Washery. Further details of the existing surface water management system are provided in **Appendix 4**, including water supply, and site water demands and uses.

Water monitoring is undertaken at the Springvale Coal Services Site. This involves routine water quality sampling at 11 locations and visual inspections of settlement ponds, sumps, culverts and storm water drainage channels. Two relatively new monitoring points (Wangcol Creek NOW Gauging Station 212055 and Wangcol Creek Far Downstream) were added to the monitoring program in September 2011. These sites enable the analysis of receiving water quality as well as the quality of water in Wangcol Creek below the mixing zone. Additional sampling may be required during, and/or subsequent to, high rainfall events. The parameters and frequency of monitoring at each location are detailed in **Table 42**.

The location of the Project falls within the bounds of the Greater Metropolitan Region Unregulated River Water Sources Water Sharing Plan (WSP) which commenced on 1 July 2011. The WSP manages the protection of the environment, water extractions and licences for specific water sources and any water trading within the coverage of the plan. The WMA regulates water resources in NSW and determines how water is used, how water works are constructed and provides rules for development near water sources. The WMA applies to all areas in which a WSP has commenced.

Table 42 Existing Surface Water Monitoring Program

Site Code	Purpose	Frequency	Parameters
LDP 006	Water quality monitoring requirement for EPL3607.	Monthly (during discharge)	pH, EC, TSS, Oil and Grease (TOG) Total Dissolved Solids (TDS), Hardness, CO3, OH, HCO3, Alkalinity, SO4, Cl, Ca, Mg, Na, K, NO3, P, Al, B, Cd, Fe, Mn, Ni(filt), Ni(tot), Se, Zn(tot) and Zn (filt)
	National Pollutant Inventory (NPI) reporting	Quarterly (Feb, May, Aug and Nov).	NPI Parameters – 93 priority substances
Wangcol Ck Upstream	Water quality of Wangcol Creek	Weekly	pH, EC, TSS, TOG TDS, Hardness, CO3, OH, HCO3, Alkalinity, SO4, Cl, Ca, Mg, Na, K, NO3, P, Al, B, Cd, Fe, Mn, Ni(filt), Ni(filt), Ni(tot), Se, Zn(tot) and Zn (filt)
Wangcol Ck Downstream			
Wangcol Ck NOW Station 212055			
Wangcol Ck Far Downstream			
Cooks Dam	Water quality	Weekly	pH, EC, TSS, TOG TDS, Hardness, CO3, OH, HCO3, Alkalinity, SO4, Cl, Ca, Mg, Na, K, NO3, P, Al, B, Cd, Fe, Mn, Ni(filt), Ni(filt), Ni(tot), Se, Zn(tot) and Zn (filt)
Retention Pond	Water quality	Weekly	pH, EC, TSS, TOG
Main Sediment Pond			
Stockpile Sediment Pond			
Washery Sediment Pond			
Sediment Pond 6			

Consultation with the EPA has occurred in the development of the monitoring program and in particular the monitoring of receiving water quality in accordance with ANZECC Guidelines. This liaison will continue

during the application for a new Environment Protection Licence (EPL) covering the Western Coal Services Project.

The section of Wangcol Creek as it passes the Springvale Coal Services Site is classified as a fourth order stream using the Strahler (1952) method and is approximately 700 metres long. Downstream, Wangcol Creek flows a further two kilometres as a modified fourth order stream, before discharging into the Coxs River.

The section of Wangcol Creek within the PAA exhibits three different stream types as follows:

- Low Sinuosity, Fine Grained System – exhibits a low sinuosity channel with continuous floodplains and relatively stable, cohesive banks due to the fine-grained material;
- Channelised Fill System – comprise a laterally stable channel of low sinuousity incised within flat and featureless floodplains; and
- Valley Fill System – characterised by a relatively flat, featureless valley floor surface that lacks a continuous, well-defined channel.

Due to the relatively disturbed nature of the regional area as a result of past mining and agricultural practices, Wangcol Creek is in moderate to poor geomorphic condition. Poor condition reaches are associated with the Channelised Fill sections of Wangcol Creek. All other sections are considered to be in moderate geomorphic condition.

9.5.3.4 Surface Water Impact Assessment

Overall, and after mitigation measures have been implemented, the Project's impact on water quality will be further improved. The improvements will be progressively implemented and monitored to verify that the anticipated improvements are realised.

No increased land scouring is expected or additional sedimentation impact to offsite watercourses is anticipated. The upgrade of the Washery will ensure that all water from the coal handling, associated stockpile areas and REAs is channelled correctly to sediment settling/pollution control ponds before being either recycled and/or sufficiently treated for discharge.

The key potential impacts on surface waters identified during the construction phase of the Project include increased potential for sediment movement due to earthworks. Altered drainage patterns may arise due to the excavation and movement of soil, dam construction/merging and Link Haul Road construction.

The key aspects that have the potential to cause impacts during the operational phase of the Project include:

- Sediment movement from the expanded REA;
- Storage, use and discharge of treated water have the potential to mobilise contaminants during transit and have elevated levels of EC and TDS due to evaporation during storage;
- Sustained rainfall may lead to a decrease in settling pond residence times and hence an increase in suspended sediments levels of the discharged water; and
- Coal stockpiles, spoil piles and coal fines on the ground can lead to pollution of surface water runoff. Dust suppression and effective drainage can adequately mitigate against these potential impacts.

During the rehabilitation phase the removal of infrastructure has the potential to impact drainage patterns. Final drainage at the Springvale Coal Services Site will be contoured to ensure effective drainage and the land re-vegetated or modified as appropriate.

Other surface water impacts are identified in **Table 43**.

Table 43 Surface Water Related Aspects and Impacts During Operation

Surface water related aspect	Potential impacts
Storage and use of runoff from disturbed areas	Water draining from the coal Washery and stockpile areas is currently controlled by the two dams. The size of these dams has been assessed as part of the water balance, in addition to estimates of the number and size of required sediment control ponds.
Discharge of treated water from site	The combination (mixing) and discharge of worked clean and treated water from site. Disruption to flow regime causing erosion.
Excessive sedimentation	The generation of excessive sedimentation in site streams (particularly Lamberts Gully) exceeding EPL. Subsequent changes to water quality, increase deposition of sediment downstream in Wangcol Creek, including clogging of culverts under the Castlereagh Highway. Creation of swampy areas below the discharge point in the vicinity of the Highway. Alterations to drainage channel dimensions and creek geomorphology.
Loss of storage capacity in sediment control dams.	Excess sediment filling dams and potentially leaving site. Leakage through dam wall.
Dust suppression	Impact on vegetation and quality of discharged water through the gradual degradation of recycled water quality.
Coal stockpiles and reject emplacement	Seepage of poor quality water entering ground and surface waters. The increased surface elevation of spoil piles leading to increased erosion.
Waste coal fines	Contamination of surface runoff.
Blocked drainage channels	Sediment may back up under proposed Link Haul Road crossings.
Vegetation removal	Increased soil erosion may occur if a significant amount of vegetation is removed from catchment areas adjacent to the Coal Services site. Species loss may lead to an overall degradation of the environment.
Flooding	Flooding of Castlereagh Highway as a result of blocked culverts/inadequate drainage capacity under the highway. During and following prolonged rainfall events pumping from Cooks Dam to the DML containment takes place in order to minimise spillage and reduces risk of overtopping of the Dam. This pumping saves water, reduces spillage to LDP006 and reduces risk of the overtopping of the dam sides reducing the flooding of the highway downstream. The potential for a 'backwater' effect from clogging of culverts could cause partial flooding near the main entrance.
Leakage from storage ponds	Leakage from existing ponds (DML and Cooks) could cause poor quality water to leave site without being channeled through LP006.
Storage and use of chemicals/fuel on site	Accidental spills and leaks entering the site surface water reuse system. Potential discharge to Wangcol Creek.

The potential impacts on the geomorphology of Wangcol Creek as a result of the Project include:

- Alteration of the discharge regime from LDP006 and potential impacts on downstream sediment transport and scour processes; and
- The construction of the Link Haul Road across Wangcol Creek.

Discharges from LDP 006 would reduce due to the increased water usage in the upgraded Washery process. Given that the creek does not actively transport bedload material, the impact of the reduction in LDP006 discharges on the creek geomorphology is considered to be negligible.

The proposed Link Haul Road crosses Wangcol Creek at a location where it exhibits a Channelised Fill system with a shale bedrock floor. The bedrock would restrict the potential for bed scour associated with flow

concentration due to the presence of the crossing. Additionally, given the channel is already incised, the crossing is unlikely to result in any significant channel alteration beyond the extents of the actual footprint of the crossing. The Water Balance and Surface Water Impact Assessment notes that the biocycle sewerage system on site does not require upgrading as it was constructed with sufficient capacity for the former Lambert Gully Open Cut.

9.5.3.5 Consequences of Potential Surface Water Impacts

Despite the fact that there have been improvements in water quality leaving the Springvale Coal Services Site over recent years, if the proposed mitigation strategies outlined below are not implemented the opportunity for further improvements in the aquatic ecology of Wangcol Creek may not be realised. There is also the risk of water quality impacts during construction particularly increased sediment load leaving the site. The most critical component of the construction program is the crossing of Wangcol Creek and specific mitigation strategies are proposed to control erosion risk.

9.5.3.6 Surface Water Management and Mitigation

The following mitigation measures will be implemented to manage potential surface water impacts during all phases of work:

- A single Water Management Plan will be prepared for the entire PAA and will include operation of the new infrastructure, water recycling system, surface and groundwater monitoring including Wangcol Creek mixing zone and a staged implementation of the separation of the Lamberts Gully drainage line as it passes through the Springvale Coal Services Site, as well as the localised changes associated with the recently approved Mt Piper Power Station Ash Placement Project.
- Separation of clean and dirty water at the Springvale Coal Services Site. The design will include the diversion of upstream catchments of Huon Gully around the new REA. The sub-catchment containing the existing A Pit REA (previously the Lambert Gully Open Cut) as well as the new REA will be diverted into the New Sediment Dam. This sub-catchment currently discharges to Huon Gully without treatment and therefore the proposed change will lead to improved water quality in Huon Gully. Following remediation of the new REA, this sub-catchment of Huon Gully will be restored. It is noted that Huon Gully does not currently discharge to Wangcol Creek, instead it is captured by Huon Dam which resides on Mt Piper Power Station land at the confluence of Huon Gully and Wangcol Creek. The recently approved Mt Piper Power Station Ash Placement Project also consists of surface water management works in the Huon Gully.
- Construct a pollution control pond control runoff from the new REA. This structure will have a capacity of approximately 15 Ml and will be located on the north-eastern corner of the REA. The dam will have a pipe connection to the existing Washery Dam, which is connected to Cooks Dam via a pipeline. This will enable treated stormwater from the new REA to be recycled back to the Washery via Cooks Dam. This dam is to be constructed once the current A Pit REA is completed but prior to the base of the new REA being completed.
- Provision of a belt press filter system (or equivalent) to recover water from the tailings produced from the new Washery. This water recovery system will cover tailings produced from the existing Washery but will be installed as part of the construction of the new Washery.
- Apply for a separate EPL covering the entire PAA that includes LDP 003 (Kerosene Vale Stockpile Area) and LDP 006 and LDP 007 (conveyor at Duncan Street, Lidsdale).
- Relocate the current LDP 006 to the spillway of Cooks Dam and replace the existing LDP 006 with a license monitoring point.
- Following completion of the Link Haul Road, complete the additional riparian planting for a 100 m section of Wangcol Creek downstream of the Link Haul Road crossing. The species selection and density is to be determined in consultation with the SCA and NOW.

- Site specific trigger values based on ANZECC 2000 Guidelines will be developed for Wangcol Creek.
- An erosion and sediment control strategy will be implemented as part of a CEMP. This strategy will incorporate specific conditions of the Project Approval, EIS commitments and requirements of the EPL;
- Structures will be designed to minimise erosion and disruption to current flow regime. Regular inspection of erosion and sediment control measures and inflow/outflow points will be undertaken, particularly following storm events;
- Erosion and sediment controls will be implemented as per Managing Urban Stormwater: soils and construction (Landcom, 2004) during construction;
- Contaminated water will be contained on site and channelled towards the containment ponds;
- Surface water sampling and analysis will be undertaken prior to discharge in accordance with the EPL;
- A detailed site water management plan will be prepared prior to commissioning new infrastructure. This plan will be compliant with all applicable development consent conditions, EIS commitments, Water Licensing and EPL requirements;
- The biocycle sewerage system on site was constructed with sufficient capacity for the former Lambert Gully Open Cut and therefore does not require upgrade.
- Provision of bank stability works at the crossing of Wangcol Creek;
- Impediment of flows will be avoided through selection of an appropriate crossing type;
- Concentration or redirection of flow will be avoided on the outlet of crossing. Where this is not possible, appropriate scour protection measures will be provided;
- The need for access of heavy machinery to the bed of the waterways will be avoided with works being undertaken from the top of the banks where possible;
- The disturbance of surrounding banks by machinery or other construction works will be avoided;
- Vegetation clearance will be avoided where possible to protect soils from erosion. If clearance cannot be avoided, the area of vegetation cleared at any one time should be minimised; and
- Disturbed areas will be stabilised and vegetation reinstated.

9.5.3.7 Neutral or Beneficial Assessment

SEPP (Sydney Drinking Water Catchment) 2011 requires all new developments in the Sydney drinking water catchment to demonstrate a NorBE on water quality. The SCA has established an assessment guide to assist in addressing relevant issues to determine whether or not a project will have a NorBE on receiving water quality. A number of supporting guidelines and interactive tools have been developed by the SCA to assist approval authorities in undertaking a NorBE Assessment. Of relevance to the Western Coal Services Project is the SCA guideline entitled 'Development in Sydney's Drinking Water Catchment Water Quality Information Requirements'.

Regarding the Western Coal Services Project, the Guidelines require the following information to be included in the assessment:

- Details of the Project including site plans and constraints;
- Site contamination report;
- Water quality control details;
- Surface water modelling;
- Pollution control details, including any erosion and sedimentation controls;
- Water balance and water cycle management;

- Identification of the likely pollutants of concern (both construction and operation);
- Identification of measures to control the identified pollutants;
- Description of the expected levels of pollutants before and after the development; and
- Details of any required offsets.

These matters are discussed below.

Project Plans and Constraints

Details of the Project components are provided in Chapter 4 of the EIS. The Project includes upgrades to the existing Springvale Coal Services Site, as well as the inclusion of the existing and ongoing operations of the overland conveyors, and the Angus Place to Mt Piper and Angus Place to Wallerawang private haul roads.

Site Contamination

A Phase 1 ESA for the Springvale Coal Services Site has been carried out. This indicates that the potential contamination at the Site presents a low to moderate risk to human health and the environment. The Phase 1 ESA recommends that a Phase 2 Assessment be undertaken at target areas, including the old underground mine pit top, which contained fuel and oil storages. Although these sites have been rehabilitated, the Phase 2 Assessment will consider potential contamination in the accessible areas, and also assess the potential for off-site migration. Should any remediation be required, it will be conducted following the results of the Phase 2 Assessment. A Phase 2 Assessment of the entire will be conducted before February 2015, in accordance with Springvale Coal's stated commitments to the NSW EPA.

The monitoring data from LDP 006 has not detected the presence of hydrocarbons. Since the monitoring data does not indicate that contamination, if it exists, is leaving the site, any further reductions in on-site contamination will not have any measurable effect on water quality. Therefore, this component will have a neutral effect on water quality.

Water Quality Control Details

Section 2.5, Section 4, Section 5, Section 9.5.3, and Section 9.5.4 of this EIS detail the existing and proposed water management systems for the Western Coal Services Project. The primary site is the Springvale Coal Services Site, which has a long history of mining activities but has been the subject of progressive improvements in water quality leaving the site. This has primarily been the result of rehabilitation work, drainage improvements, dirty water containment and recycling of process water from the Springvale Coal Services Washery.

Springvale Coal Services has also upgraded the environmental monitoring systems in order to provide additional information on water quality and discharge volumes. This has assisted in determining the effectiveness of the controls provided. The data shows a progressive improvement in water quality leaving the site over the past 10 years. As discussed in Section 9.5.3.6, the Project has incorporated additional water quality control measures designed to provide an improvement in water quality leaving the site.

Surface Water Modelling

RPS Aquaterra has modelled both surface and groundwater systems at the Springvale Coal Services Site and the results are detailed in Section 9.5.3 and Section 9.5.4. The modelling is based on long-term discharge volume data from LDP 006, the NOW Gauging Station in Wangcol Creek, and rainfall data. The data set has enabled an accurate model to be developed which has been used in the assessment of impacts.

Pollution control details including any erosion and sedimentation controls

The additional water management controls proposed as part of this Project are summarised below:

- Provision of a belt press filter to dewater tailings from the Washery. This will result in improved water recycling from the new facility;
- Provision of additional pollution control storage to cater for the new REA. This pond has been sized at 15 Ml and will be linked to the Washery pond to enable recycling into the process water circuit; and
- Rehabilitation of the remaining disturbed areas not required for the ongoing operation as shown on **Figure 12**. This plan shows the Year 5 rehabilitation commitment which identifies areas within the Lamberts Gully drainage line that will be maintained as clean catchments.

Erosion and sedimentation controls will be detailed in the CEMP for the Project and will be installed in accordance with the publication Managing Urban Stormwater: Soils and Construction (Landcom) and associated Volume 2E: Mines and Quarries. The majority of the construction area exists within the controlled area of the site around the existing Washery for the infrastructure activities, and within the footprint of the original Lamberts Gully Open Cut for the new REA.

The proposed Link Haul Road lies outside the existing dirty water catchment of the Springvale Coal Services Site and will therefore require additional erosion and sedimentation controls. These will be detailed in the CEMP and include:

- Construction of drainage channels to direct clean water away from the construction activities associated with the new haul road. These channels will be trapezoidal rather than 'V' shaped, to reduce scour potential;
- Stripping and separately stockpiling topsoil from the Link Haul Road footprint for use in rehabilitation of the haul road batters;
- Erection of silt control fencing down slope of the topsoil stockpile;
- Constructing sediment basins in accordance with the publication Managing Urban Stormwater: Soils and Construction (Landcom) and associated Volume 2E: Mines and Quarries to control runoff from the disturbed area of the new road crossing;
- Rehabilitation of the Link Haul Road batters as soon as practical following completion. Active stabilisation will be provided by using a binder (organic binder or equivalent);
- Avoiding disturbance of surrounding banks of Wangcol Creek by machinery or other construction works;
- Access of heavy machinery to the bed of the waterways will be avoided where possible, with works preferentially undertaken from the top of the banks, and:
- Scour protection measures will be extended to include minimisation of any further retreat of the existing headcuts in Wangcol Creek. These additional works will address an existing and progressing erosion problem in Wangcol Creek.

The above measures are designed to provide at least a neutral effect on Wangcol Creek during construction. However, the additional scour protection measures will provide long-term benefits by removing an existing source of erosion and sedimentation issue within the creek. These will be located downstream of the creek crossing and at the existing headcut which is just upstream of the creek crossing.

Water Balance and Water Cycle Management

The Water Balance and Surface Water Impact Assessment found that the Springvale Coal Services Site will require additional water despite the increase in water recovery and recycling. This in turn, however, will reduce the volume of process water that will require discharge from the site. The discharge point will be relocated to the spillway of Cooks Dam and the existing discharge point replaced with a monitoring point to

provide verification of the improved separation of clean water through the site. This progressive separation of clean water (from the upper catchments discharging into Wangcol Creek) from the process water circuit will provide a beneficial effect to Wangcol Creek. The volume of clean water from the undisturbed catchment above the site will be similar to that currently, though some variation is expected with rainfall. The volume of process water being discharged from Cooks Dam will reduce due to the additional water required by the new Washery.

The anticipated discharge of clean water from the Lamberts Gully catchment is 1.329 Ml per day, while the future discharge from Cooks Dam will be 0.378 Ml per day. The 98th percentile rain day, that is, what is expected to occur 2% of the time, will result in approximately 4.3 Ml per day being discharged from Cooks Dam and clean water passing through the site via the current LDP 006 location is estimated at 10.6 Ml per day.

The rehabilitation plan described in Section 5 of the EIS describes the proposed progressive rehabilitation of the site areas not required for the ongoing operation to a stable vegetation system. This forms part of the separation of clean water within the Lamberts Gully drainage line, which will provide beneficial effects on water quality entering Wangcol Creek.

Identification of the likely pollutants of concern (both construction and operation)

The discharges into Wangcol Creek from the site have been subject to water quality monitoring for several years and an Aquatic Ecology Assessment is provide in **Appendix 9** of this EIS. This Assessment included ecotoxicological testing and an assessment under ANZECC 2000 Guidelines. This work showed that despite the fact that Wangcol Creek is essentially a reconstructed creek through and around old and present mine works, it provides aquatic habitat commensurate with its condition and historic impacts. It provides valuable aquatic (including fish) habitat and provides fish passage, but would benefit from ongoing improvements in water quality. The Project will provide an ongoing beneficial effect on Wangcol Creek. The main pollutants of concern include:

- Conductivity – this is a measure of the salt content in water including the levels found in groundwater and recirculated water at the Springvale Coal Services Site. Compared to the receiving waters of Wangcol Creek, conductivity is elevated in Cooks Dam – which is expected with this being the final discharge point of process water. The Project will assist in reducing the volume of process water discharges through increased water usage and improved separation works. This will improve water quality in Wangcol Creek by reducing the amount of salt leaving the site. It is noted that water quality and quantity discharge limits are specified in the EPL, defined at LDP006, and accordingly, it is a requirement to manage water at the site, including salinity, to meet these limits. In addition, as part of on-going operations at the Springvale Coal Services Site, a Pollution Reduction Program (PRP) examining the salinity of treated mine water has been added to the current revision of the EPL.
- Metals – including iron, manganese, nickel and zinc. These are generally higher in Cooks Dam than in receiving waters of Wangcol Creek. This is largely a result of groundwater inflows. The reduction in process water discharges will reduce the amount of naturally occurring minerals into Wangcol Creek; and
- Sediment – although the downstream sample site in Wangcol Creek has a ‘low suspended solids’ loading, there is a trend downwards. The discharge from the Springvale Coal Services Site is only one component of the background water quality. There has been a reduction in the volume of sediment leaving the site and this will continue as rehabilitation works within the Lamberts Gully drainage line further progress.

Identification of measures to control the identified pollutants

The primary measures to reduce the concentration of minerals and salt leaving the site is the separation of dirty water entering the Lamberts Gully drainage line, and the reduction in the volume of process water leaving Cooks Dam.

The principal pollutant is sediment. This will be controlled by the implementation of erosion and sedimentation controls as previously described. The construction of the Link Haul Road will include additional scour protection of the Wangcol Creek banks, which will reduce the current sediment load created by an existing head cut in the creek bed.

The Link Haul Road crossing will be designed to accommodate the anticipated flood flows of Wangcol Creek to avoid sediment movement due to concentration of flow.

Description of the expected levels of pollutants before and after the development

The Springvale Coal Services Site has been undertaking ongoing water quality and aquatic ecology studies for the past 2 years. These studies will continue and it is anticipated that the improvements in water quality leaving the site will be detected over the next 5 years. It will not be possible for the site to be 'nil-discharge'. However, the volume of discharged water will progressively reduce, meaning that the mixing zone length within Wangcol Creek will also reduce. The long-term goal is to meet the Site Specific Trigger Values at the edge of the mixing zone.

Offsets

In addition to the specific mitigation measures, the aquatic biodiversity of Wangcol Creek will be improved by selected riparian planting for a distance of 100 m downstream of the Link Haul Road crossing. This will not only compensate for the minor loss of aquatic macrophytes during the construction program, but also provide an improved aquatic habitat within the mixing zone below the current discharge point.

The additional scour protection to remove and stabilise an existing head cut in the creek will also provide long-term benefits by reducing sedimentation within the mixing zone.

The project also provides for the completion of the separation of Lamberts Gully from the disturbed areas as it flows through the Springvale Coal Services Site. This will involve the rehabilitation of existing disturbed areas that contribute poor water quality within the site as well as constructing a combination of lined channels and pipes to convey the clean flow from above the site down to the current LDP 006 location.

Overall it is concluded that the Project will have a beneficial effect on water quality within Wangcol Creek.

9.5.3.8 Conclusion

The Western Coal Services Project provides an opportunity to implement water management strategies to further improve drainage systems and manage water quality across an existing mining area.

The Springvale Coal Services Site will include a new Washery with a belt press filter, a new REA, and the practical and improved separation of the clean and dirty water on the site.

In general terms, the future scenario improves the water management of the site. A new sediment dam, of at least 15 Ml of storage capacity, will be constructed to collect the proposed REA drainage. The process water recycling system will provide approximately 60% of the total water demand.

Cooks Dam and the DML Dam form part of the water recycling system. They are interconnected via a pipeline as well as connected to the Washery Dam and Washery water supply tank via pipelines. They are fed via a shallow aquifer that is connected to old underground mine workings and receive surface runoff from disturbed areas owned by Delta Electricity. The interception and use of this water has beneficial implications in terms of reducing potential downstream water quality impacts. The use of this water also reduces the need for the operation to source alternative water supplies such as storages within Lamberts Gully.

However, water shortages during droughts will occur and will require the provision of an external water source. Expected water shortages in the Washery will be between 20% and 30% of the days in the future, which is an increase compared to the current situation. This is due to the increase of the overall water demand, although the improvements in water recirculation, and the effective drainage and water storage of the new REA, will help to partially compensate the increase in the water demand. The shortfall in process water makeup will be provided via a pipeline from the Springvale Mine which will be constructed along the existing overland conveyor system as was envisaged and approved under the 1992 Springvale Mine consent.

The Project will rely mostly on the use of water contained within the pollution control system and recycling initiatives including the proposed new REA and ground water interception in the DML and Cooks Dams. The increased rate of recirculated water from the Washery and disturbed areas will beneficially reduce discharges from the site, as well as reduce the risk of discharge amounts exceeding the quality criteria. Discharges to Wangcol Creek have been slightly reduced to a daily average of 1.33 Ml/d, with discharges exceeding the limit of 10Ml/ only a 2% of the time. With the improved separation of clean and dirty water systems, approximately 70% of the discharge in future will be clean water from the Lamberts Gully catchment and only 30% would be spillage from Cooks Dam. When LDP 006 is relocated to the discharge from Cooks Dam, the the current discharge volume limit for the site would remain beneath the 10 Ml/day limit virtually 98.5% of the time.

The existing coal processing operation uses 0.885 Ml per day which will increase to a total of 2.725 Ml per day with the increase coal processing and dust controls. The increased water recycling capability to remove and recover water from the tailings will result in approximately 1.5 Ml per day of water recovery and recycling and only 0.34 Ml per day of make-up water required. Zero discharge from the site operation is not possible, but the existing LDP limits are more achievable, although they will be exceeded during flood events.

Overall, the development will provide an opportunity to improve the water management system for the Springvale Coal Services Site by incorporation of water recycling systems, separating the operation from clean water passing through the Site and constructing an additional 15 Ml of dirty water storage. The Project is likely to result in beneficial outcomes for Wangcol Creek by reducing process water discharges, improved dirty water storage and recycling capacity and maintaining clean water flow through the site from upstream undisturbed areas. As the rehabilitation of the disturbed areas continues to take place in the future, there will also be a reduction in the soil loss and expected sediment production at the Project Site.

9.5.4 Groundwater

9.5.4.1 Introduction

The BBRA for the Project considered that the management of the groundwater was a moderate risk and that while no additional controls were proposed, that a groundwater assessment would be undertaken.

RPS Aquaterra prepared a Groundwater Assessment for the Project. A copy of the Groundwater Assessment is contained within **Appendix 6.**

The report addresses the potential for the Project to lead to impacts to GDEs. In accordance with the NSW State Groundwater Dependant Ecosystems Policy, GDEs are those ecosystems which are deemed to be at least partly dependent on groundwater.

Where potential impacts on groundwater from the Project have been identified the Groundwater Assessment has quantified the limits of impact and provided suitable measures that could be implemented to reduce or manage potential impacts to sensitive receptors i.e. stream baseflows, GDEs and other water users. The Groundwater Assessment has also considered appropriate operation mitigation measures and a series of options for the management of these measures.

The Groundwater Assessment has addressed (as applicable) policies and procedures from the relevant state policies and guidelines including;

- National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC);
- NSW Inland Groundwater Shortage Zones Order No.2 (2008);
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000);
- Australian and New Zealand Guidelines for Water Quality Monitoring;
- NSW State Groundwater Policy Framework Document (DLWC, 1997);
- NSW State Groundwater Quantity Management Policy (1998);
- NSW State Groundwater Quality Protection Policy (DLWC, 1998);
- NSW DECC, 2007. Guidelines for the Assessment and Management of Groundwater Contamination;
- Murray-Darling Basin Groundwater Quality Sampling Guidelines. Technical Report No.3 (MDBC);
- Murray-Darling Basin Commission Groundwater Flow Modelling Guideline (Aquaterra Consulting Pty Ltd, 2001);
- Guidelines for the Assessment and Management of Groundwater Contamination (DECC, 2007);
- NSW State Groundwater Dependent Ecosystem Policy (2002);
- Guidelines for Groundwater Protection in Australia (1995);
- Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land (DOP);
- POEO Act;
- Aquifer Interference Policy (DPI, NOW, September 2012);
- Water Sharing Plan for Greater Metropolitan Region Groundwater Sources and Unregulated River Water Sources (July, 2011); and
- Water Management Act 2000 and Water Act 1912.

Water Management Act 2000, Water Act 1912 and Water Licensing

The Water Management Act 2000 (WMA) and the Water Act 1912 are administered by the NOW and contain approval requirements to regulate the extraction of surface water and groundwater and any associated interception and interference with water sources in the Project and the Springvale Coal Services Site. The WMA applies to all areas in which a water sharing plan has commenced.

The location of the Project falls within the bounds of the Greater Metropolitan Region Unregulated River Water Sources Water Sharing Plan (WSP), which commenced on 1 July 2011. The WSP manages the protection of the environment, water extractions and licences for specific water sources and any water trading within the coverage of the plan. The Washery upgrade aims to make use of worked water, giving preference to seepage water which is intercepted in the DML Dam and Cooks Dam and supplemented with worked water contained in pollution containment ponds below the new REA and the Washery. The seepage water is thought to originate from old mine workings, reject emplacements and shallow aquifers. Prioritising the use of this worked water will help reduce the amount of worked water discharged from the Springvale Coal Services Site.

The interception and extraction of groundwater from any of the aquifer systems will be subject to conditions and management in accordance with the Water Sharing Plan for Greater Metropolitan Region Groundwater Sources, as the Springvale Coal Services Site is located within or close to the Wangcol Creek, which is part of the Coxs River Source and under Water Sharing Plan for NSW Murray Darling Basin Fractured Rock

Groundwater Sources. These water sharing plans were gazetted in July 2011 and January 2012 respectively. As presented in the Groundwater Assessment, there is no interception of aquifers as a result of current site operations and open cut voids are dry. During and post operations, there is negligible change to groundwater that is reporting to down-gradient dams and therefore no additional licences will be required.

Protection of the Environment Operations Act 1997 and Environmental Protection Licence

As determined in Section 120 of the POEO Act 1997, waters are not to be polluted except as expressly provided for in an Environmental Protection Licence (EPL).

Springvale Coal has been granted an EPL for coal works and mining for coal (EPL3607), which covers the mining operation, surface facilities at Springvale Coal Mine pit top, overland conveyors and the Springvale Coal Services Site. EPL467 held by Angus Place Colliery covers the mining operation, surface facilities and road haulage of coal from that colliery. It is proposed (as a component of the Project) to apply for a separate EPL covering the Springvale Coal Services Site inclusive of all coal transport infrastructure and operations, thereby integrating components of both EPL 3607 and EPL 467.

EPL 3607 (as per version date 19 December 2011) allows for the discharge of water from LDP 006 located near the Springvale Coal Services Site entrance and Castlereagh Highway, which subsequently flows into Wangcol Creek. Discharged water is required to be monitored for quality. The volumetric/mass limit on LDP 006 for discharge is 10,000 kL/day and it is not intended to change this limit.

9.5.4.2 Existing Environment

The outcropping Illawarra Coal Measures cover the entire PAA. There is no mapped occurrence of alluvium and the Wangcol Creek mainly flows over the rocky exposed Permian bedrock. Berry Siltstone (Shoalhaven Group) which underlies the Illawarra Coal Measures outcrops to the south of the PAA.

Old mine workings exist beneath the Springvale Coal Services Site and several historical open cut mines exist nearby. Some of those have been backfilled by ash (at Mt Piper Power Station to the west), rejects, or remain as open voids which are saturated.

The primary water bearing zones on site are associated with the mined out Lithgow Seam and the undisturbed Marrangaroo Formation and Berry Siltstone. The old workings within the Springvale Coal Services Site appear to be connected to the open cut areas, which have not been backfilled.

Local shallow groundwater flow is generally towards Wangcol Creek, and thus groundwater contribution to the creek is possible. This relationship depends on the elevation of the creek and the groundwater in the surrounding area. In the vicinity of the Springvale Coal Services Site, it is likely that the creek is a 'losing creek' where any leakage from the creek may contribute to groundwater. Since the creek is receiving additional recharge from the Mt Piper Power Station upstream and discharge from the Springvale Coal Services Site, the water levels are artificially raised. In addition, the groundwater flow gradient is downwards in the deep aquifer, indicating that no base flow contribution will occur from the deeper aquifers.

Groundwater inflow into the Springvale Coal Services Site currently occurs from the groundwater intercepted in the existing open cut, however this is mostly dry. The inflow into the Springvale Coal Services Site would occur via rainfall infiltration and flow down gradient into the historical underground workings and dams. No GDEs have been identified in the Springvale Coal Services Site.

The following field and desktop groundwater investigations were carried out at the Springvale Coal Services Site:

- Assessment and water level monitoring of three groundwater monitoring bores (piezometers) below the Lithgow Seam;

- Hydraulic (slug) testing of two groundwater monitoring bores;
- Water quality sampling;
- Review of hydrogeological and other relevant reports produced for Angus Place Colliery, Mt Piper Power Station, Yarraboldy Extension 1, Neubecks Creek Project, Waste Disposal Facility at Blackmans Flat and Springvale Mine; and
- Construction of a numerical groundwater model for assessing potential impacts.

No physical works are proposed for the other components of the Western Coal Services Project, namely the existing overland conveyors, private haul roads and the Kerosene Vale Coal Stockpile Area.

The existing groundwater monitoring network at the Springvale Coal Services Site comprises three standpipe piezometers (BH1, BH2 and BH3) which have been manually monitored for groundwater levels and quality initially following installation in December 2009 with subsequent monitoring being undertaken during 2012. A plan indicating the location of the boreholes and location of creeks is provided in **Figure 28** and **Figure 29**.

Water levels in individual bores range between approximately 904m AHD and 920.9m AHD. Water levels in all three monitoring bores respond well to rainfall recharge with BH2 showing the greatest rise of just less than two metres in response to high rainfall events during first half of 2012.

Field measurements of pH and EC collected during drilling, bore installation and ongoing monitoring are recorded in **Table 44**.

Table 44 Summary of On-Site Groundwater Quality

Bores (Marrangaroo/Berry Formations)	Water Quality		
	EC (uS/cm) Range	pH Range	Data Points
BH1	1972–2270	5.9–6.4	4
BH2	859–913	6.5–7.7	3
BH3	817–865	4.5–5.7	4

The groundwater values range from neutral to acidic, and the water quality is generally fresh, with the exception of BH1 which is brackish.

Further details on regional groundwater levels and quality are provided in Section 3 of the Groundwater Assessment report contained within **Appendix 6.**

Figure 28 Location of Boreholes on Springvale Coal Services Site

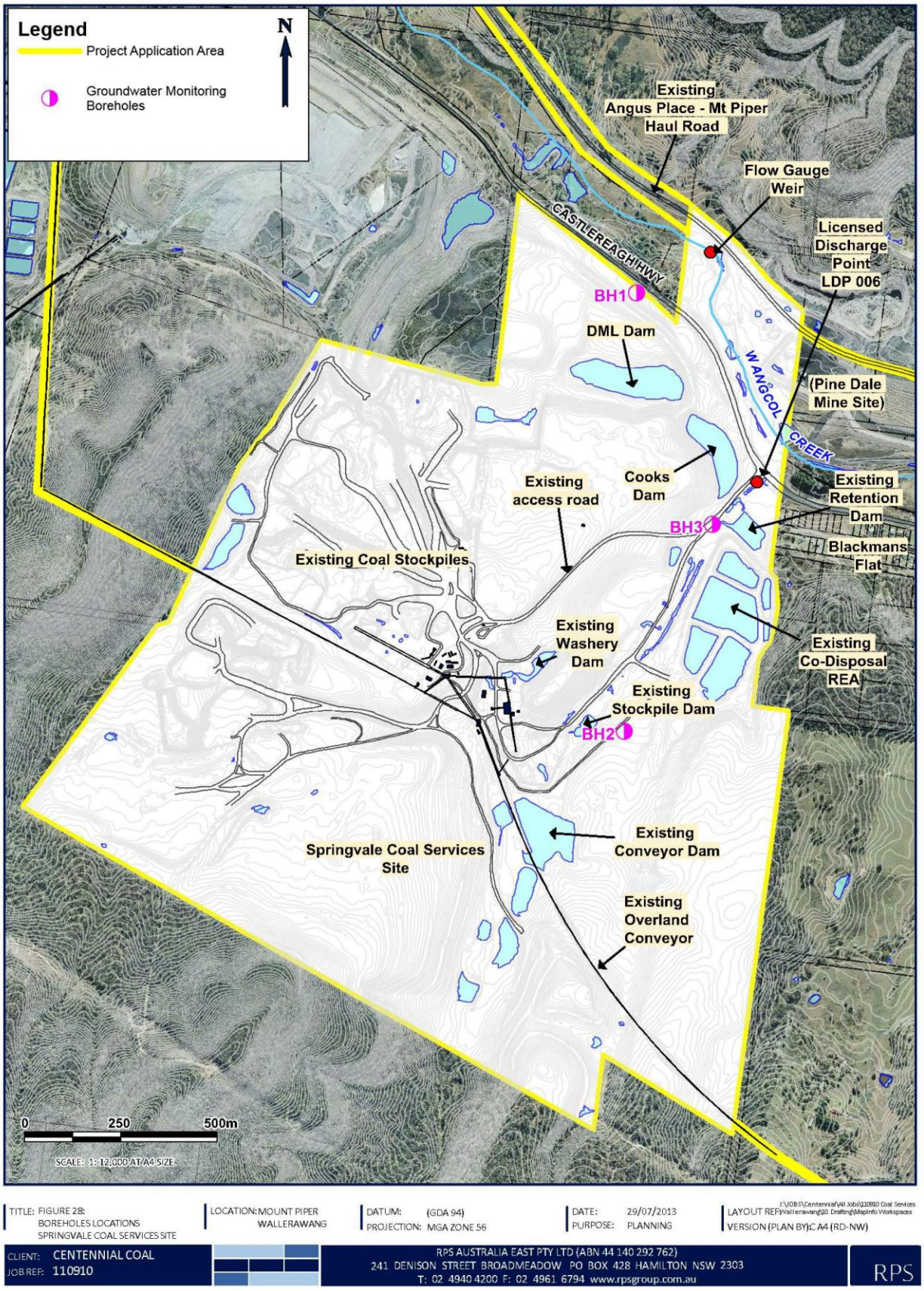
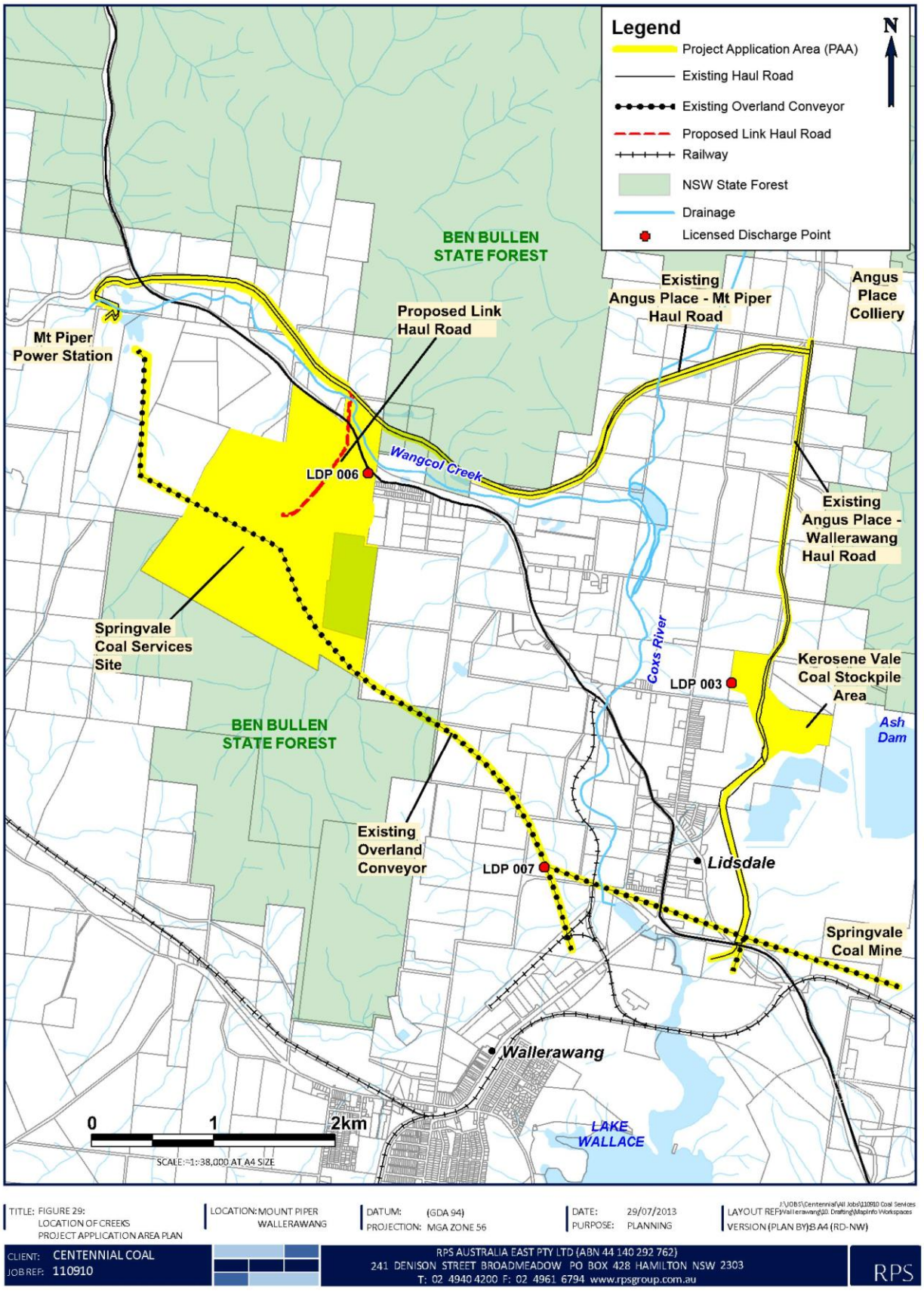


Figure 29 Location of Creeks and Rivers



9.5.4.3 Water Management Impact Assessment

A local scale numerical model has been developed by RPS Aquaterra for the Springvale Coal Services Site. The model includes all naturally occurring features in the area and is suitable to assess the local groundwater impact from the Western Coal Services Project. The cumulative impact from other industries is considered without reference to the model as they are located down gradient. The old mine workings and non-operational open cut areas are included in the model. The areas to the north were included in the model as good quality groundwater monitoring records exist for aquifers in this area.

The numerical model was set up to simulate groundwater conditions over a 100 km2 area, to include nearby historical and current mine operations and allow for potential future cumulative impact assessments. The model structure, modelling approach, model calibration, results of simulations and the assessment of potential impacts to the groundwater environment are discussed in detail in the following sections.

Groundwater inflow into the Springvale Coal Services Site currently occurs from the groundwater intercepted in the previously open cut and in-filled areas. These areas remain mostly dry. Groundwater inflow into the Springvale Coal Services Site occurs via rainfall infiltration and flow down gradient into the historical workings and containment dams.

Predictive analytical modelling has indicated that groundwater inflow to the DML and Cooks Dam will increase slightly from 81 m3/day to 88 m3/day when the site ceases operation in 25 years. The minor increase will most likely occur with the slight change in soil permeability expected when land on the Site is developed as the REA. It is also predicted that the same volume will be lost from the DML and Cooks Dams as a result of leakage and evaporation.

No groundwater inflow control strategies are required as a result of the Project as any increase in contribution to the DML and Cooks Dams will be used within the water management circuit. The DML and Cooks Dams will receive treated water from other pollution control storages prior to reuse within the Washery.

Predicted groundwater levels in the shallow aquifer and the Lithgow Seam indicate negligible impact from the Project.

Cumulative Impact on Groundwater from Surrounding Industries

The surrounding industry upstream of the Springvale Coal Services Site (Mt Piper Power Station) maybe affecting the groundwater in the Lithgow Seam as currently constructed dams and ash emplacement areas are located in the surficial aquifer. Therefore, any potential leakage from the ash emplacement areas and dams may affect groundwater quality and flows down gradient.

It is predicted that 7.7 m3/day of water will enter the Springvale Coal Services Site dams by the end of operational period as a result of the Project. This is considered very small when compared to the flow in the Wangcol Creek and overall site water balance. No measurable drawdown is predicted as a result of the Project. In addition, the water from the DML and Cooks Dams is being used on site for operational purposes and any leakage flows below the creek bed.

Other mines such as Pine Dale Mine and Angus Place Colliery are located down gradient and at a significant distance from the Springvale Coal Services Site such that there would be no influence on the groundwater system.

Impact on Licensed Water Users

The predicted minor increase (7.7 m3/day) in groundwater discharge to the DML and Cooks Dams down gradient will have negligible impact on groundwater levels. The increased discharge is the result of elevated recharge and is not a net loss to the system.

The closest licensed groundwater bores in the vicinity of the Springvale Coal Services Site are located approximately 1 km from the site boundary. The bores were installed for power station monitoring and no abstraction is registered from these bores.

It is therefore assessed that the Project would not impact on any groundwater users in the area.

Impact on Surface Water

The closest surface water system is the Wangcol Creek down gradient of the Springvale Coal Services Site. It is assessed that the Wangcol Creek is a losing creek at this location; therefore a minimal change to groundwater discharge of 0.9 m3/day will not impact the creek.

The EPA suggests that water quality observed at LDP 006 is being detrimentally impacted by groundwater seepages to DML and Cooks Dams. An increased groundwater discharge to these dams will therefore have potential for a flow on effect to water quality at LDP 006 and Wangcol Creek. While it is noted that this is an existing potential impact, improvements to the site surface water management system will aim to achieve a NorBE on the existing water quality discharging from site. The proposed augmentation of the groundwater monitoring program will also assist in quantifying the impact of the proposed development and inform long term water management decisions.

Apart from the increase in inflow to dams on the Springvale Coal Services Site over the life of the Project (7.7 m3/day), there will be no other impacts to aquifer systems. It must be noted that this water is primarily surface water that is recharging the groundwater system locally, not regionally. During the operational period of the Project and placement of rejects in the designated area, the rate of groundwater discharge to dams will increase from nil to 7.7 m3/day.

Impact to Groundwater Dependent Ecosystems

No sensitive GDEs have been identified within the Springvale Coal Services Site. Any potential ecosystems associated with the Wangcol Creek would not be impacted by the Project both in relation to water quality and quantity. Efficient site management, including groundwater reuse and storage in on-site dams will ensure no GDEs will be impacted.

9.5.4.4 Consequences of Potential Groundwater Impacts

The predicted minor increase in groundwater discharge to the dams on the Site is likely to have a positive impact on the ground water resource and coupled with improvements to the site surface water management system will achieve a NorBE on the existing water quality discharging from site. There will be no impacts to the ground water resource or to any GDE's.

9.5.4.5 Mitigation and Monitoring Measures

On-ground protection measures and management practices during the construction, operation and decommissioning stages of the Project will be based on the Current Recommended Practices (CRPs) and Standards (where applicable) endorsed by the SCA. The CRPs relevant to this Project relate to meeting the requirements of the publications Managing Urban Stormwater: Soils and Construction 4th edition, practice guidelines for managing unsealed roads including the publication Road Runoff and Drainage: Environmental Impacts and Management Options and Principles for Managing Mining and Coal Seam Gas Impacts. The

protection measures and management practices during all Project stages would be based on the NSW State Groundwater Policy Framework Document (DLWC, 1997), NSW State Groundwater Quality Protection Policy (DLWC1998), NSW State Groundwater Quantity Management Policy (DLWC, 1998), ANZECC (2000) and National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ and ANZECC, 1995).

During the construction phase a seepage interception scheme will be installed down gradient of DML and Cooks Dams. This will have the benefit of improving catchment water quality in accordance with the DGRs.

Additional groundwater monitoring bores will be installed in shallower formations to assess potential surface water / groundwater interaction as well as establish up-gradient baseline conditions. New monitoring bores will be surveyed. Further details on the current and future monitoring program are provided in Section 7 of the Groundwater Assessment report contained within **Appendix 6**.

Existing bores BH1, BH2 and BH3 will be continued to be monitored. A baseline groundwater monitoring program will be undertaken as follows:

- Quarterly monitoring of water levels from the network of monitoring bores following the completion of construction; and
- Six monthly sampling of monitoring bores for field analysis of pH, EC and temperature and laboratory analysis on major ions, pH, EC, TDS, dissolved arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel and zinc.

9.5.4.6 Conclusion

Overall the impact of the Project on the groundwater system, licensed groundwater users, Wangcol Creek and downstream GDEs is considered to be minimal. Increases in groundwater discharge to dams on the Springvale Coal Services Site will have a beneficial effect on the existing water quality discharging from Site.

The impact assessment has indicated that the existing and future operation of the Western Coal Services Project poses a very low risk to groundwater systems. Addition groundwater monitoring will be undertaken in order to verify the predicted impacts.

9.5.5 Social

9.5.5.1 Introduction

Mining and power generation infrastructure is characteristic of the landscape around Lithgow, Wallerawang, and Lidsdale and seems to be generally accepted. Community stakeholders also acknowledge that mining and power generation have brought about economic benefits for the community, through both direct and indirect employment.

The BBRA for the Project considered that community issues were moderate in terms of requiring consideration during the EIS preparation and that a social impact consultant should be engaged to address this. Accordingly, James Marshall and Co was engaged to undertake a SIA for the Project, and a copy of this SIA is contained within **Appendix 7.** The approach for the SIA draws upon the *Techniques for Effective Social Impact Assessment: A Practical Guide* (Office of Social Policy, NSW Government Social Policy Directorate). The SIA takes into account the scope of the development and how the development will impact on the needs, issues, values and aspirations of the surrounding community stakeholders.

9.5.5.2 Existing Environment

The Project is located in the Western Coalfield, between the Mt Piper and Wallerawang Power Stations and surrounded by coal mining operations and infrastructure. Rural land and isolated rural residents, transport

infrastructure and State Forest are also characteristics of the area. Located on the immediate eastern boundary of the Springvale Coal Services Site is the main residential area of Blackmans Flat. The main residential area of Blackmans Flat contains some 11 occupied homes with a total of approximately 30 residents. A plan illustrating the location of the main residential area of Blackmans Flat, and the localities of Lidsdale, Wallerawang and Wolgan Road is found in **Figure 30**. Community consultation has shown that residences of the main residential area of Blackmans Flat already experience cumulative impacts from a number of nearby developments. These impacts are predominantly noise, dust and visual.

9.5.5.3 Stakeholder Consultation

To assist with understanding the potential social impacts of the Project, the SIA reviewed the outcomes from previous consultations. These included the development of LCC's Land Use Strategy, and consultations undertaken by the Department of Planning in early 2011. Springvale Coal has also undertaken direct consultation with residents regarding this Project.

Lithgow Regional Forum 25 February 2011

The former NSW Government presented a number of regional forums at the beginning of 2011 to discuss and explore the NSW Coal and Gas Strategy (now replaced with the Regional Strategic Land Use Strategy). A summary of relevant and key themes raised by speakers included:

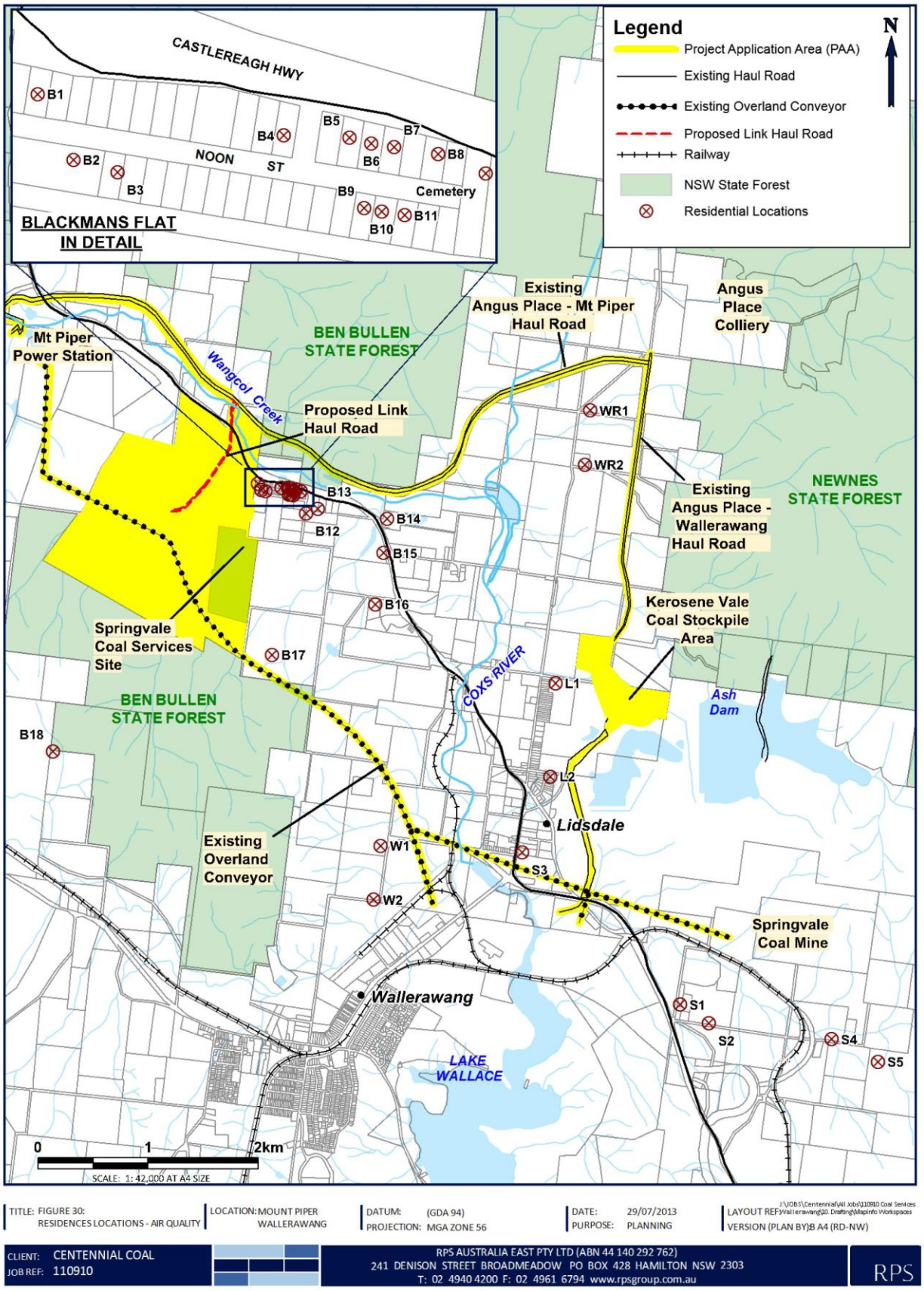
Issues relating to Coal Mining

- Coal mining can effect landowners. Current environmental issues in the area may have resulted from coal burning;
- In relation to mining, there should generally be better controls regarding impacts on the environment;
- There should be buffer zones where mining does not occur in order to provide clean zones for better lifestyle. It is important to protect the ecology and biodiversity of an area;
- Mining can be very divisive in local and regional communities;
- Government and the community can't just look at the anti-mining concerns – the strategy needs to look at a set of balanced outcomes; and
- The socio-economic benefits of mining should not be underestimated.

Social and community impacts

- Given the Sydney Basin is almost exhausted for housing, the western areas (including those in, and around, Lithgow) provide an opportunity to house people – mining may compromise that opportunity;
- There is a need to take into account the needs of future generations in terms of health, housing, ageing population etc., and to provide suitable environments in which they can live;
- Balance and certainty for communities are important issues that need to be addressed;
- There is a reluctance on the part of industry to embrace the protection of other values;
- Serious consideration needs to be given to the assumptions and values that are placed on the growth of energy demand and its importance in terms of jobs;
- In 20 years time, food shortages may be a concern – long-term goals and priorities for the use of our land should be an important consideration in the development of a Coal and Gas Strategy;
- Tourism – local and regional tourism would be devastated by mining;
- The costs, benefits, and value associated with good lifestyle areas, tourism, and ecological assets, need to be modelled;

Figure 30 Residence Location Plan



- People are concerned about the health impacts of mine operations and want to ensure they have a positive quality of life, health, food, water, and social connectivity within their community;
- The values of different land uses, lifestyle opportunities, health benefits, food security etc. must be recognised;
- Mine closures have disastrous effects and families on jobs – it was not long ago that there were protests about job losses in Lithgow due to mine closures;
- Legislation needs to change so that property owners know they are likely to be effected by mine operations before the license is issued;
- There needs to be a better contribution towards the needs of communities on the part of industry – the cost of social infrastructure needs to be met;
- Baseline data Is needed to accurately gauge cumulative impacts of heavy industry;
- Communities have been calling for independent studies for a long time;
- Local communities are being devastated by mining (churches, fire services, schools etc. are losing people);
- As mining represents such value to the state, consideration should be given to covering the community against the costs of these major developments; and
- SIAs should be undertaken to gauge impacts.

Springvale Coal Community Information Sessions

In early 2012, Centennial commenced a regional engagement process involving four Projects: The Western Coal Services Upgrade, Lidsdale Siding Upgrade, Springvale Coal Mine and Angus Place Colliery modifications.

Information regarding the projects was communicated by:

- A letter-box drop of leaflets during early March 2012, inviting the regional community to the abovementioned Community Information Sessions; and
- A series of articles and advertisements placed in the Lithgow Mercury to provide the regional community with an update on the Project.

Following the letter-box drop, Community Information Sessions were held at the Country Women's Association in Wallerawang on:

- Wednesday 14 March 2012, evening session from 4pm to 8pm;
- Saturday 17 March 2012, morning session 9am to 1pm; and
- Tuesday 20 March 2012, morning session 9am to 1pm.

Springvale Coal representatives from the Project were present at all three sessions. Information boards with project plans and illustrations were on display. The outcomes of the sessions were subsequently reported in the Lithgow Mercury on 21 April 2012. Issues raised by the community in relation to the wider regional developments included:

- General visual impacts, particularly from open cut mining;
- Intensification of mining activities; and
- The recognition of impacts from sources outside of Springvale Coal's control, such as other mining operations and the two power stations.

Direct Engagement

As a result of the March 2012 community information sessions facilitated by Springvale Coal, a number of Blackmans Flat residents prepared a submission outlining their opposition to the Western Coal Services Project. Residents stated that the existing cumulative impacts of nearby projects have resulted in the loss of property values, increased noise – including noise from blasting and truck movements, health issues relating to dust, visual impacts, restricted access to areas of the forest which were once enjoyed for walking, and an overall loss in residential amenity.

Residents also expressed concern that the proposed expansion of Pine Dale Mine; nearby ash placement for Delta; proposal by Enhance Place to open cut mine in Ben Bullen State Forest; the allocation of land for a rubbish tip, and the then suggested recommendation to zone Blackmans Flat as industrial, to recognise its dominant land use (as per the Draft Lithgow Land Use Strategy), would all have further adverse impacts on residential amenity.

In their submission, residents acknowledge the need to pursue growth in the economy and employment; and that the development of industry at Blackmans Flat makes a significant contribution to the local, regional and state economies. However, these benefits have been to the detriment of residents living in the immediate area.

As a result of the submission, Springvale Coal has undertaken consultation with people living in the main residential area of Blackmans Flat. These consultations found that residents have lived in the area for between 5 and, in one case, over 70 years. Residents had moved into the area for a range of reasons, these included cheaper housing prices; some came to enjoy the rural amenity prior to the expansion of industry, and some came with knowledge of the nearby industry.

All residents share stories as to how the surrounding industry has impacted on the amenity of the area and on their day-to-day life. The constant hum of the industry makes it difficult for some residents to sleep and others did not open doors or windows due to dust. Residents experienced frequent noise and vibration from blasting, which had resulted in damage to some houses. There was evidence of cracked and broken tiles and one resident reported that their front door was occasionally ‘jarred open’ by the vibration impact from blasting.

The visual impacts from the neighbouring Pine Dale Mine are imposing and the restricted access to the nearby State Forest has taken away opportunities for leisure/walking, which some residents once enjoyed. Over the past five years there have been ongoing submissions to industry, local, state and federal politicians requesting better management of these impacts. Further, there have been numerous requests for compensation and relocation from the area.

Key Themes Emerging from Community Engagement

Information gathered from the community profile, and feedback from consultations, has identified a number of key points relevant to the social impacts relating to the Project. These are summarised below:

- Mining and power generation are a significant feature of the LGA, as are agriculture and National Parks;
- Continued growth in mining and power generation is a major contributor to the economy and progress in these sectors is considered essential;
- Mining and power have been a significant source of both direct and indirect employment. Many towns and villages emerged as a result of the local mining industry and local businesses articulate the benefit they receive from ‘the mines’;
- There is a strong connection to mining in the community, however this connection is not shared across the entire LGA;

- Previous land use planning has not provided adequate protection from land use conflict. This has resulted in numerous examples of land use conflict across the LGA;
- Despite the connection to power and mining, residents to not want to be adversely impacted upon by industry when they are not at work. It would be a risk to presume that the strong connection to mining and power generation within the community meant expansion without consideration of social impacts would be acceptable;
- Amenity is still an important factor to quality of life. Noise, dust and visual impacts arising from industry will have adverse effects on residential amenity; and
- Identified benefits arising from mining, such as its role in the export economy, the construction of additional infrastructure, the creation of additional jobs – and the maintenance of those existing etc. do not outweigh the impacts on community amenity, even if the industry operates within approved limits.

9.5.5.4 Social Impact Assessment

According to the SIA, residents and local business operators in some areas (eg. Wallerawang, Lithgow and Lidsdale) talk freely about the importance of mining and clearly articulate the positive impact in relation to jobs and flow-on effects to other non-mine related businesses, in particular, to retail.

The SIA notes that the primary area of concern is Blackmans Flat, as it is located on the eastern boundary of the Springvale Coal Services Site, is directly opposite Pine Dale Mine, and within close proximity to the Delta owned Mt Piper Power Station. In addition to the Western Coal Services Project are the proposed expansion of Pine Dale Mine; the nearby ash placement for Delta Electricity; a proposal by Enhance Place to open cut mine in Ben Bullen State Forest, and the allocation of land for a waste disposal facility.

Consultation carried out by Springvale Coal highlights that residents are concerned about noise, dust, and visual impacts; which collectively relate to residential amenity. So, while the mining history and positive economic impacts are generally acknowledged in some areas of the LGA, it is not tolerated when there is an impact on day-to-day residential amenity.

The SIA notes that the LCC Draft Land Use Strategy states that a proliferation of power generation and mining activities, alongside their associated infrastructure in the area, has contributed to significant, and unresolvable, land use conflicts around Blackmans Flat. To manage this conflict, the Land Use Strategy recognises that the area is affected by a number of primary constraints and it is considered that the current use and disturbed nature of this land has diminished its environmental and residential value, and maybe more suitable for industrial uses. The Land Use Strategy also states that Blackmans Flat is an appropriate location for 'value added' industries to mining – briquettes from coal residue, ash disposal, and the future waste facility are an appropriate use of this area because a separation of residential and mining land uses would now be impossible.

With this in mind, the Land Use Strategy had initially recommended that Blackmans Flat be zoned heavy industry in its new LEP in order to remove any ambiguity regarding the dominant existing, and future, land uses of the area. This recommendation has met with opposition from residents living in the area who wish for Blackmans Flat to be zoned 'village'. Council has responded by stating that the area has never been recognised as a village by any previous planning instrument as it lacks necessary services and facilities to be considered within the adopted settlement hierarchy.

Consequently, the potential for continued land use conflict is high and no further residential land use beyond that existing, or subject to current development approval, will be encouraged in Blackmans Flat. The Land Use Strategy recommends that specific controls should be put in place to more appropriately manage land use conflict and encourage compatible land use. However, this recommendation would be difficult to achieve given the level of existing conflict.

The Western Coal Services Project will add to the existing land use conflict and further impact on residential amenity at Blackmans Flat. The specialist consultants engaged to undertake specific studies for the EIS (for example Noise Consultants) have found that there will be additional impacts on those living in the main residential area of Blackmans Flat.

The Noise and Vibration Impact Assessment Report has identified that the operational noise predictions will result in 'residual noise impacts' at some residences surrounding the Project site. Sleep Disturbance Goals are also predicted to be exceeded at the majority of residential locations. It appears that three properties fall within a Noise Affected Zone (exceedance of >5dBA) and the remainder fall within the Noise Management Zone (exceedence of between 1 dBA to 5 dBA).

It is likely that noise levels will incrementally increase by about 2 dB(A) as a result of the new Washery, infrastructure and activities associated with the REA. Potential noise mitigation measures, such as acoustics barriers at the haul road crossing, will not address all exceedances and will result in a significant visual impact within the vicinity of Blackmans Flat. The visual impact of the Link Haul Road overpass may be reduced by moving to the western alignment, screening and painting; however such steps are unlikely to appease residents.

9.5.5.5 Options to Manage Identified Social Impacts

There are three strategies that have been explored in the SIA and by the Project Team in an attempt to manage the social impacts arising from the Western Coal Services Project. The three strategies are summarised in **Tables 45** to **47**

Table 45 Strategy 1 – Land Use Conflict

Areas of Concern		SIA Response
Anticipated Outcome	**Cause**	**Management/Control**
Noise, dust and visual impacts have adversely affected the residential amenity of Blackmans Flat.	Land Use Conflict	▪ No advantage is gained by not approving the Western Coal Services Project because of the significant pre-existing adverse social impacts within the main residential area of Blackmans Flat. ▪ Facilitate the relocation of residents living in the main residential area of Blackmans Flat (ie those within the primary impact zone of the Western Coal Services Project).

Table 46 Strategy 2 – Reject Emplacement Area

Areas of Concern		SIA Response
Anticipated Outcome	**Cause**	**Management/Control**
Dust and visual impact on Blackmans Flat residents	REA.	▪ The REA has been relocated to the south-western boundary of the Springvale Coal Services Site to mitigate noise/dust impacts at Blackmans Flat residential area. ▪ The REA may be seen from Blackmans Flat after 10 years of operational life at the proposed south-western boundary.

Table 47 Strategy 3 – Link Haul Road Overpass

Areas of Concern		SIA Response
Anticipated Outcome	**Cause**	**Management/Control**
Noise, Dust and Visual Impact.	Link Haul Road overpass at Castlereagh Hwy, near Blackmans Flat.	▪ Alternate haul road route investigated (western alignment) which would reduce the number of properties within the impact zone. However, a reduction in noise to some properties would not mitigate the social impacts on the remaining properties. ▪ Visual impacts could be minimised by locating the haul road on the western alignment and screening via vegetation and paint. But again, this would not mitigate the social impacts experienced by residents. ▪ Property 1 and 7 (refer to **Figure 30**) receive the greatest amount of dust impact. Dust is within specified criteria.

The Western Coal Services Project will bring about additional noise, visual, and to some degree, dust impacts. Mitigation of these impacts has been explored and includes relocation of the REA, alternative alignment of the haul road and relocation of residents within the main residential area of Blackmans Flat.

There is no identified mitigating strategy that can address the pre-existing social impacts that are present within the main residential area of Blackmans Flat. The impact on residential amenity is significant and unresolvable.

If existing projects continued at current capacity, and no further expansion to industry was approved, at best the impacts on residential amenity at Blackmans Flat would remain. Consultation with residents has identified the impacts are: loss of access to state forest, noise, dust, visual impacts, interrupted sleep, loss of property values, and damage to property brought about by vibration from blasting. These impacts have arisen over a number of years, brought about by existing land use planning not adequately separating conflicting land uses.

9.5.5.6 Mitigation Strategy

The Western Coal Services Project will bring about additional noise, visual, and to some degree, dust impacts. Mitigation of these impacts has been explored and includes relocation of the REA, alternative alignment of the Link Haul Road and relocation of residents within the main residential area of Blackmans Flat.

Conventional measures to reduce the impacts (noise, visual, dust) will not address the cumulative impacts that have occurred over many years for the main residential area of Blackmans Flat. Lithgow Council's Land Use Strategy acknowledges this and has identified that the future zoning of Blackmans Flat will need to recognise the dominant land use – which is heavy industry, therefore removing opportunities to protect residential amenity.

A strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents has been developed. This strategy will mitigate the impacts of the Project relating to noise, dust and visual amenity on the main residential area of Blackmans Flat. Springvale Coal has written agreements with seven (7) of the nine (9) residents within the Blackmans Flat residential area. Springvale Coal is continuing to negotiate with the remaining 2 residents within the Blackmans Flat residential area. Regardless, the impact assessments in the EIS have taken into consideration all privately owned residences in the Blackmans Flat residential area. The Strategy will allow for the Project to be developed to its full potential and positively contribute to the long term viability of the industry in the region.

9.5.5.7 Conclusion

The Western Coal Services Project, including the expansion and upgrade of the Springvale Coal Services Site, will allow for effective coal handling and improved access to the export market making Springvale Coal's stake in this industry more viable. This would result in social and economic benefits to the local community and broader region through the significant level of investment required for capital upgrade and the ongoing operation of Springvale Coal's projects in the Lithgow LGA.

9.5.6 Terrestrial Ecology

9.5.6.1 Introduction

The BBRA for the Project considered that the management of ecological issues was a moderate risk. In particular, the crossing of Wangcol Creek requires additional investigations with some clearing of previously rehabilitated land required. The footprint of the existing overland conveyors, private haul roads and Kerosene Vale Coal Storage area will remain unchanged. The remaining Springvale Coal Services Site footprint is highly disturbed by existing mining operations. An Ecological Assessment was prepared by RPS and is attached at **Appendix 8**. The Ecological Assessment extends well outside the Springvale Coal Services Site and includes consideration of vegetation adjacent to the haul roads, Lidsdale Siding, Wangcol Creek and Ben Bullen State Forest. However the descriptive material within the Ecological Assessment has centred primarily on the area of vegetation impact, that being within the Springvale Coal Services Site. The Ecological Assessment includes:

- Database searches, including the EPBC Act, Protected Matters Search Tool, OEH Threatened Species, Populations and Ecological Communities website, and the Atlas of NSW Wildlife, for threatened species, populations and ecological communities within 10 kilometres of the site;
- Review of relevant documentation relating to surrounding projects including OzArc (2005). *Flora / Fauna and Heritage Assessment: open cut coal Mine Extension Lamberts Gully, NSW. August 2005* report; SKM (2010) *Mount Piper Power Station Ash Placement Project Appendix E: Flora and Fauna Impact Assessment* report; R. W. Corkery & Co. (2011) *Documentation Supporting an Application for Director-Generals Requirements for the Pine Dale Coal Mine – Stage 2 Extension;* RPS (2012) *Ecological Assessment: Lidsdale Siding Upgrade Project;* RPS (2013) *Ecological Inventory Report: Neubeck Project;*
- Review of the Vegetation of the Western Blue Mountains – including the Capertee, Coxs, Jenolan and Gurnang Areas (DEC 2006);
- Review of Geographic Information System (GIS) data including (but not limited to) aerial photography, topographic maps, State Environmental Planning Policy (SEPP) Mapping, Soil Landscapes and Acid Sulphate Soil Potential; and
- Ecological field surveys of the Springvale Coal Services Site and surrounding areas conducted in December 2010, August 2011, September 2011 and February 2012. The surveys included vegetation communities surrounding the Springvale Coal Services Site, Wangcol Creek, Neubeck Project area to the north-west, Lidsdale Siding and surrounding vegetation, Springvale Coal Mine Pit Top and vegetation between Angus Place Colliery Pit Top and Wallerawang Power Station including vegetation around the Kerosene Vale Coal Storage Area.

In order to assess the potential for ecological impacts by the Project detailed desktop and field surveys were carried out within the designated search areas by two ecologists from RPS on the 13th to 17th December 2010, 29th and 30th August 2011, 28th and 29th September 2011 and 6th, 7th and 8th February 2012. An additional site visit was made on 24th August 2012 to survey the two options for the Proposed Link Haul Road alignment. The surveys included site inspections to identify initial constraints to inform project design; vegetation community surveys and various fauna survey methods including Elliot trapping, diurnal bird and herpetological surveys, bat echolocation recording, spotlighting/call playback, opportunistic sightings and habitat assessments. The Ecological Assessment included intensive targeted flora surveys undertaken

within habitats potentially suitable for *Eucalyptus aggregata* (Black Gum), *Eucalyptus cannonii* (Capertee Stringybark), *Thesium australe* (Austral Toadflax) and *Derwentia blakelyi*, as these species are known to occur in the immediate locality of the Springvale Coal Services Site. However all additional flora species listed in listed under the TSC Act 1995 and/or the EPBC Act 1999 were afforded consideration during surveys. Habitat situated in all areas proposed to be impacted upon by infrastructure were included in targeted threatened flora surveys. Whilst the GPS tracks were not captured for all areas, these areas were extensively surveyed. The locations of any threatened flora species that were found within close proximity to the site were recorded by the use of Trimble differential GPS units with sub-metre accuracy.

The location and effort of each fauna survey methodology used for the Ecological Assessment was determined based on the fauna habitat located within the site via stratification of the site into habitat types. The main fauna survey techniques were undertaken in areas that had the highest potential to detect as many fauna species as possible. Targeted survey techniques, such as trapping was therefore not undertaken in areas of regrowth or planted vegetation, as any potentially occurring fauna species had greater chance of occurring in more intact areas of woodland. Where specific targeted surveys were not undertaken, potential for fauna species to occur within available habitats was afforded consideration. Consideration of the available habitats with regard to threatened reptile and amphibian species found that no threatened herpetofauna species listed under the TSC Act and/or EPBC Act were likely to occur within the Springvale Coal Services Site. As no potentially suitable habitats for threatened herpetofauna were located, the use of opportunistic sightings and surveys targeting specific sites was considered sufficient.

Further details on survey effort, including a cumulative analysis of selected survey techniques and effort undertaken both within the Springvale Coal Services Site, the PAA and locality, are described within Section 3 of the Ecological Assessment included in **Appendix 8.**

The prevailing weather conditions during the ecological field surveys carried out in 2010, 2011 and 2012, as identified earlier in this Section are presented in **Table 48.**

Table 48 Prevailing Weather Conditions

	Temperature Min-Max (ºC)	Rain (24 hrs to 9:00am)	Sun Rise (AEST)	Sun Set (AEST)	Moon Rise (AEST)	Moon Set (AEST)
13th Dec 2010	6.8-23.9	0	0515	1916	1129	2347
14th Dec 2010	11.1-21.8	0	0512	1927	1223	N/A
15th Dec 2010	13.2-26.2	0	0512	1928	1317	0015
16th Dec 2010	14.4-25.2	1.8mm	0512	1929	1413	0043
17th Dec 2010	12.2-19.1	19.8mm	0512	1930	1511	0115
29th Aug 2011	3.4-16.2	0	0512	1937	0557	1753
30th Aug 2011	0.6-15.2	0	0603	1925	0634	1902
28th Sep 2011	5.7-14.5	0	0603	1924	0541	1900
29th Sep 2011	10.0-12.4	19.6mm	0604	1923	0622	2013
6th Feb 2012	13.4-26.6	0	0605	1922	1736	0325
7th Feb 2012	14.4-18.9	0	0606	1920	1817	0428
8th Feb 2012	13.2-16.7	1.8mm	0615	1909	1854	0532
24th Aug 2012	2.8-10.7	10.0mm	0627	1737	1021	N/A

Source: Bureau of Meteorology website: http://www.bom.gov.au/climate/dwo/IDCJDW2075.latest.shtml information for Lithgow, and the Geoscience website: http://www.ga.gov.au/bin/geodesy/run/gazmap_sunrise?placename=lidsdale&placetype=0&state=0

9.5.6.2 Existing Environment

Key findings and recommendations from the Ecological Assessment are summarised below and the Assessment is included in **Appendix 8.**

The Springvale Coal Services Site is a well-established coal processing site, having previously been an active mine site for many years. The site includes a Washery, conveyors, coal stockpiles, REAs and associated infrastructure – including dams and rehabilitated areas. The existing overland conveyors and private haul roads cross primarily cleared agricultural land. In sections where they pass through forested areas, they lie entirely within existing cleared easements.

Vegetation Communities

A majority of the site is cleared, previously mined, or disturbed land. Only small pockets of undisturbed native vegetation still exist on the site, these being in Lamberts Gully close to the southern boundary of the site, along the eastern boundary, and a small pocket east and north of the Washery. There are relatively small areas of regenerated vegetation on rehabilitated parts of the old Lamberts Gully Open Cut Mine site.

The total site area is approximately 287 hectares and can be described as follows:

- 51% of the site is cleared and severely disturbed, being mined/worked land;
- 24% of the site is planted/regenerated vegetation – previously mined areas;
- 24% of the site is relatively un-disturbed native vegetation; and
- Less than 1% of the site is pine plantation.

Fine-scale mapping of areas within the site at Lamberts Gully (SKM 2010) distinguished four vegetation communities. These communities were classified independently of regional mapping communities identified by DEC (2006) and included:

- MU 1: Brittle Gum – Red Stringybark Woodland
- MU 2: Scribbly Gum Woodland
- MU 3: Ribbon Gum Woodland
- MU 4: Rehabilitation Areas

Analysis of the floral composition of these communities as identified by SKM (2010) has determined that the Brittle Gum – Red Stringybark Woodland (MU1), Scribbly Gum Woodland (MU2) and Ribbon Gum Woodland (MU3) are all localised variants of Cox's Permian Red Stringybark – Brittle Gum Woodland (MU 37) as mapped by DECC (2006). These communities have subsequently been considered as commensurate with MU37 to allow for RPS mapping across the site to conform with DECC (2006) mapping where possible.

Vegetation communities were mapped by RPS using ground-truthing methods described by DECCW (2008, as cited in **Appendix 8**). The vegetation community mapping for the Springvale Coal Services Site is shown in **Figure 31**. Ground-truthing confirmed the presence of six vegetation communities, namely:

- MU 11 – Tableland Gully Snow Gum – Ribbon Gum Grassy Forest;
- MU 15 – Tableland Hollows Black Gum – Black Sally Open Forest;
- MU 37 – Coxs Permian Red Stringybark – Brittle Gum Woodland;
- MU 59 – Non-native Vegetation – Pine plantation/woodlot/shelter;
- MU 62 – Cleared and Severely Disturbed Lands; Planted/Regenerating Vegetation (no equivalent community within DEC (2006)); and
- Phragmites Wetland (no equivalent community within DEC (2006)).

The area of each vegetation community has been calculated and is outlined in **Table 49**. In addition, the areas of predicted vegetation removal have been calculated based upon the Proposed Infrastructure identified in **Figure 7** and **Figure 8** in Section 4 of this EIS.

Figure 31 Vegetation Community Plan

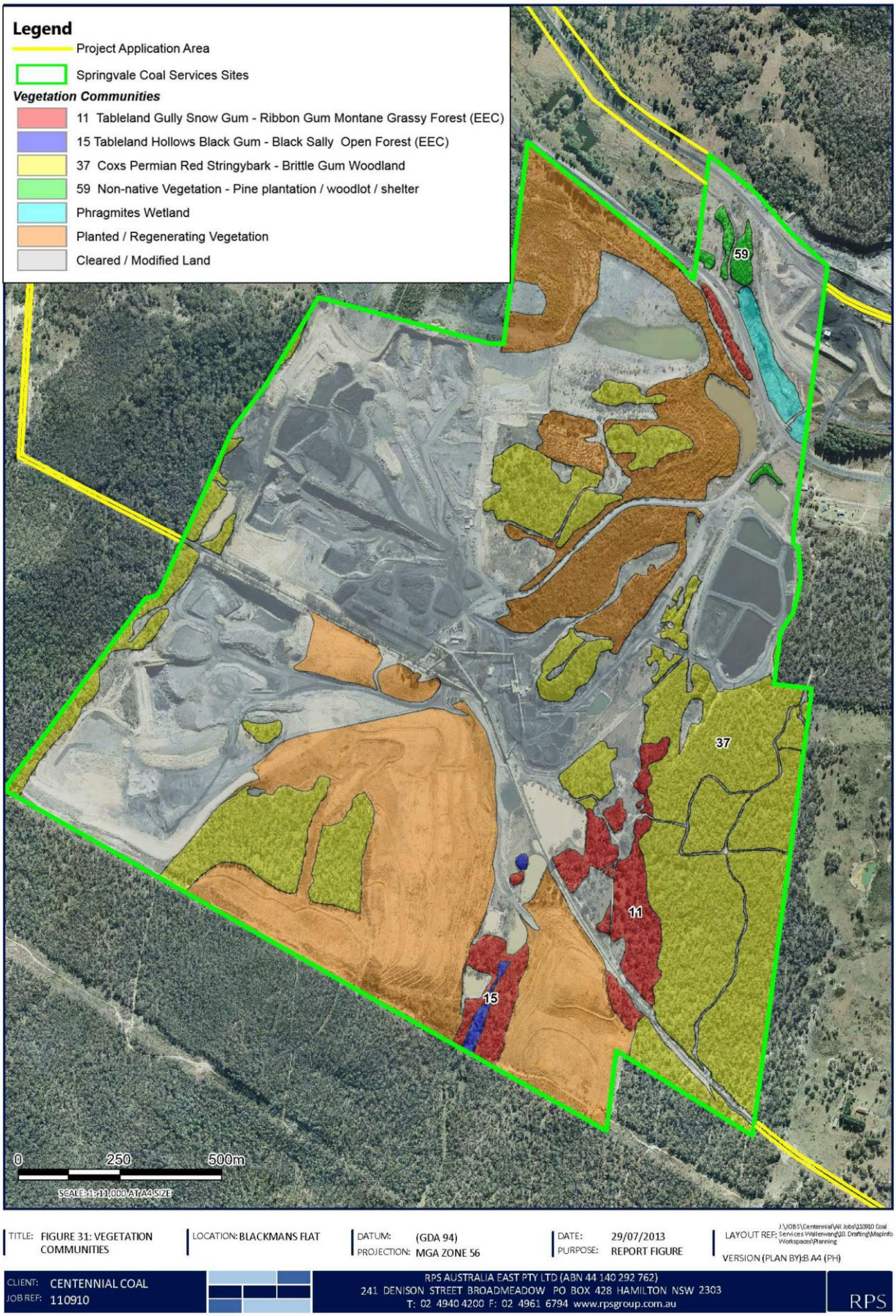


Table 49 Areas of Vegetation Communities on Site

Vegetation Community	Area (ha) on site	Area (ha) within proposed REA footprint	Area (ha) within Haul Road Option 1	Area (ha) within Haul Road Option 2
MU 11 – Tableland Gully Snow Gum – Ribbon Gum Montane Grassy Forest	9.65	–	–	0.05
MU15 – Tableland Hollows Black Gum – Black Sally Open Forest	0.56	–	–	–
MU 37 – Coxs Permian Red Stringybark – Brittle Gum Woodland	57.24	10.35	0.12	0.27
MU 59 – Non-native Vegetation – Pine plantation/woodlot/shelter	1.24	–	0.03	0.05
Planted/Regenerating Vegetation	71.73	30.13	0.65	0.54
Phragmites Wetland	1.99	–	0.12	-
Sub-Total (Vegetated)	**142.41**	**40.48**	**0.92**	**0.91**
MU 62 – Cleared and Severely Disturbed Lands	154.30	31.82	1.16	0.74
Total	**296.71**	**72.30**	**2.08**	**1.65**

Significant Flora

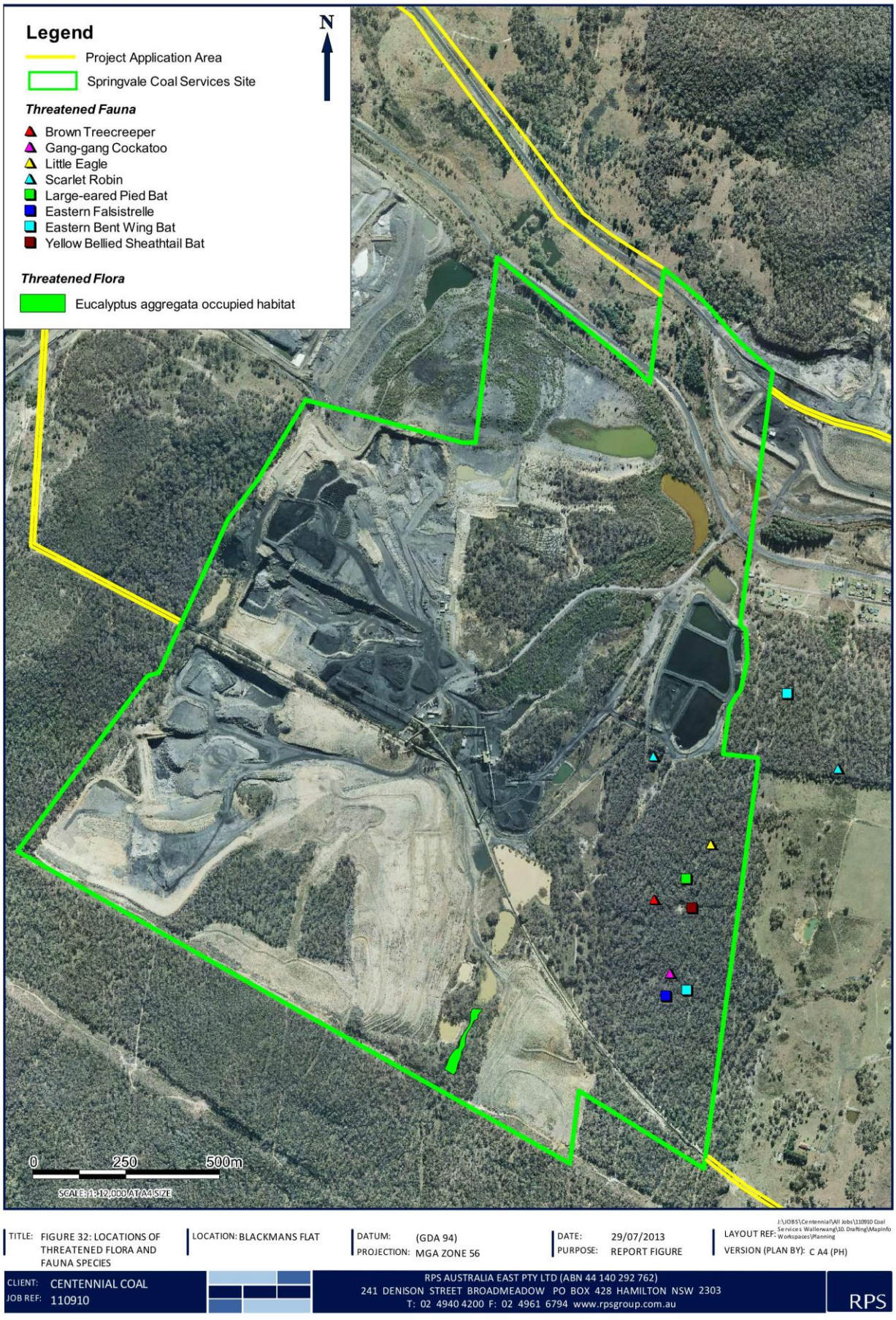
The results of database searches indicated that twelve threatened flora species have been previously recorded within 10km of the site and/or have potential habitat within the site. The threatened flora species that have been recorded within the locality of the site are listed in **Table 50**. The location of Threatened Fauna and Flora Species within the site and surrounds is illustrated in **Figure 32.**

Table 50 Threatened Flora within 10km of the Study Site

Scientific Name	Common Name	TSC Act Status	EPBC Act Status	Number of records
Asterolasia elegans	–	–	E*	0
Boronia deanei	Deane's Boronia	V	V*	0
Derwentia blakelyi	–	V	–	14
Eucalyptus aggregata	Black Gum	V	–	14
Eucalyptus cannonii	Capertee Stringybark	V	–	19
Eucalyptus pulverulenta	Silver-leafed Gum	V	V	1
Genoplesium superbum	Superb Midge Orchid	E	–	1
Microtis angusii	Angus's Onion Orchid	E	E	0
Persoonia marginata	–	V	–	0
Prasophyllum sp. Wybong	Leek-orchid	–	V	0
Pultenaea glabra	Smooth Bush-pea Bush-pea	V	V	2
Thesium australe	Austral Toadflax	V	V	0

Notes: (PD) = Preliminary determination (E) = Endangered Species listing
(V) = Vulnerable Species listing (CE) = Critically Endangered Species listing

Figure 32 Location of Threatened Flora and Fauna Species



Targeted searches were undertaken for threatened flora species potentially occurring on site, with particular emphasis on surveying potential habitat available on site for those species recorded at nearby locations (RPS 2012; 2013) and recorded within NPWS Atlas records (2013). Targeted threatened flora surveys by RPS identified one threatened flora species within the site, namely *E. Aggregate,* as identified in **Figure 32**, which is listed as Vulnerable under the TSC Act 1995. No additional threatened flora species were recorded on site, however it is noted that one plant species listed as Vulnerable under the TSC Act 1995 and EPBC Act 1999 has previously been recorded, namely *E. cannonii* (SKM 2010). Only five *E. aggregata* trees were found in the Tablelands Gum – Peppermint woodland to the east of the dam that occurs within Lamberts Gully. This area was cleared in January 2007. The trees were felled and left for seed harvesting prior to being windrowed. Over half a kilogram of seed was harvested and some has been used in seeding of the rehabilitation program and some has been retained for future use.

No other threatened species were observed during either the RPS or SKM (2010) flora surveys undertaken on the site.

Suitable habitat occurs for *T. australe* within the grassy understorey that characterises much of the vegetated area on site. One area with suitable damp grassy habitat containing patches of *Themeda australis* occurs within the pine plantations in the north of the site. *T. australe* is a root parasite, with a preference for *T. australis*. *T. australe* has been detected approximately 240 metres north of the Springvale Coal Services Site. However, targeted surveys have failed to detect *T. australe* on the Springvale Coal Services Site.

Habitats

Habitats within the site were assessed for their potential to support native fauna species including threatened fauna that records indicate occur within the wider locality. Broad habitat types recorded within the site included open forest areas and cleared lands.

Terrestrial Habitats

The Tableland Hollows Black Gum- Black Sally Grassy Open Forest consists of a grassy understorey which provide suitable habitat for a number of terrestrial mammals, including macropods and wombats. The understorey structure in this community is generally lower than in other communities due to the natural absence of a shrub layer. The Red Stringybark- Brittle Gum woodland supports a more complex understorey and would also provide suitable habitat for a range of species utilizing shrubs for nesting and/or foraging.

Understorey structure is generally characterised with sufficient structural diversity and debris to provide foraging opportunities for a range of common and threatened woodland bird species which may be occasional visitors to the site due to its connectivity to adjoining State Forest.

The Red Stringybark- Brittle Gum woodland provides suitable habitat for the threatened flora species *E. cannonii*. The Tableland Hollows Black Gum - Black Sally Grassy Open Forest provides the most suitable habitat for the threatened *E. aggregata*. Areas containing *Themeda australis* (Kangaroo Grass) were discovered within the grassy understory of the Pine Forest in the north of the site. These areas provide suitable habitat for the threatened *Thesium australe*, which is known to be a root parasite of *Themeda australis.*

The shrub *Bursaria spinosa* subsp. *lasiophylla* (Blackthorn) is the larval food plant of the threatened Bathurst Copper Butterfly (*Paralucia spinifera*). As a result, areas of *B. spinosa* subsp. *lasiophylla* provide critical habitat for the Bathurst Copper Butterfly. Given that records for both *B. spinosa* subsp. *lasiophylla* and the Bathurst Copper Butterfly exist within the sites locality targeted searches for this shrub were conducted across the site. However, no *B. spinosa* subsp. *lasiophylla* individuals were recorded on the site, and it was therefore determined that it was unlikely that the site represents potential habitat for the Bathurst Copper Butterfly.

Aquatic Habitats

The Lamberts Gully watercourse is a perennial watercourse in which threatened aquatic flora and fauna species are not expected due to the combination of a limited catchment resulting in a non-permanent water flow, and the lack of separation between upper sub-catchment runoff water and process water management structures within the middle and lower sub-catchments.

Wangool Creek is a watercourse containing some semi-permanent ponds and low diversity fringing habitat suitable for some aquatic species. The Project involves a bridge crossing over Wangool Creek for the proposed Link Haul Road, regardless of which option is taken. Wangool Creek is classified as 'Class 2 – Moderate Fish Habitat' under the DPI Fisheries Stream classification scheme and is considered to provide suitable habitat for freshwater fish, plants and macroinvertebrates that utilise upper reaches of pools and streams.

It was concluded that the proposed upgrade works, combined with improved site water management measures, creek riparian and stream bank stabilisation, and vegetation management measures will result in an overall improvement of water quality and aquatic habitat condition for the benefit of the aquatic biota residing in the creek adjacent to the site. These measures will also improve conditions for fish passage past the site.

Arboreal Habitats

Hollows occurred at a moderate density on-site, reflecting the presence of hollow dependent arboreal mammal species. The presence of arboreal mammal populations at the site suggests that there are sufficient foraging opportunities to support forest owls, although a general paucity of large hollows places constraints upon breeding opportunities for these species.

Corridors and Habitat Linkages

The site is located on the edge of the Ben Bullen State Forest, with the larger portion of the state forest (~500ha) reoccurring to the north-east of the site. Castlereagh Highway and Boulder Road divide a remnant patch of forest surrounding the site that connects to Ben Bullen State Forest; however, terrestrial animals are still physically able to cross these roads when traffic is not heavy.

In the broader regional context, the village of Portland separates the vegetation on the site from a larger remnant area of vegetation in the Sunny Corner State Forest to the west. Falnash State Forest is a small remnant patch of vegetation situated to the southwest which has no connectivity to the vegetation on site, and Lidsdale State Forest is disconnected from the site vegetation to the south by the town of Wallerawang and Lake Wallace.

Groundwater Dependent Ecosystems

The watercourse associated with Lamberts Gully is intermittent and does not support any riparian vegetation. Wangcool Creek is a mostly permanent creek with some riffles and semi-permanent pools. In the vicinity of the proposed works, Wangcool Creek is underlain at a depth of approximately 0 to 3 metres by a coal seam. This is the same coal seam being mined by the Pine Dale mine immediately to the north of the project area.

Wangcool Creek is a surface flow and the vegetation surrounding the creek within the site, and surrounding areas, is highly disturbed vegetation that has been largely cleared and is characterised by the presence of exotic trees such as willows and pines with a pasture understorey. Due to the above factors, it is considered that the site does not contain any Groundwater Dependent Ecosystems as defined by the DLWC (2002).

There are no surface aquatic ecosystems either totally, or substantially, dependent on groundwater (GDEs) in Wangool Creek or within the sub-catchment drainages through or in the vicinity of the upgrade site.

Significant Fauna

The results of database searches (NPWS Atlas of NSW Wildlife, EPBC Protected Matters Search, and a DPI threatened aquatic species search) indicated that 42 threatened fauna species have been previously recorded within 10km of the Site (the locality) and/or have potential habitat within the site.

Terrestrial Mammals

Open forest communities containing grassy understorey components provide suitable habitat for a number of terrestrial mammals. One species of macropod was observed within the site, namely, the *Macropus giganteus* (Eastern Grey Kangaroo). Evidence in the form of burrows and scats were observed for the *Vombatus ursinus* (Common Wombat), although no individuals were recorded. Two introduced mammal species were recorded on the site, being the *Vulpes vulpes* (Red Fox) and *Oryctolagus cuniculus* (Rabbit). During Elliott trapping, no small terrestrial mammals (e.g. *Dasyurids* or Rodents) were captured.

Arboreal Mammals

Canopy tree species and understorey proteaceous shrubs provide abundant foraging resources such as foliage, seeds pollen, nectar and invertebrates for possums, gliders and bats. Two arboreal mammal species, being the *Pseudocheirus peregrinus* (Common Ringtail Possum) and *Trichosurus vulpecula* (Common Brushtail Possum) were identified during spotlighting on site.

Bats

Eleven species of microchiropteran bat were positively identified from Anabat echolocation call recording within the site. Of these, four species are listed as threatened under the TSC Act 1995. These included the *Chalinolobus dwyeri* (Large-eared Pied Bat), *Falistrellus tasmaniensis* (Eastern Falsistrelle), *Miniopterus schreibersii oceanensis* (Eastern Bent Wing Bat) and *Saccolaimus flaviventris* (Yellow Bellied Sheathtail Bat). Common species identified on the site included the *Austronomus australis* (White Striped Freetail Bat), *Mormopterus Species 2* (Eastern Freetail Bat), *Chalinolobus gouldii* (Gould's Wattled Bat), *Chalinolobus morio* (Chocolate Wattled Bat), *Vespadelus darlingtoni (*Large Forest Bat), *Vespadelus regulus* (Southern Forest Bat), and *Vespadelus vulternus* (Little Forest Bat)

Avifauna Survey

A moderate diversity of common open forest birds, including those characterising elevated habitats, were observed across the site. Four threatened species, being *Hieraaetus morphnoides* (Little Eagle), *Petroica boodang* (Scarlet Robin), *Callocephalon fimbriatus* (Gang Gang Cockatoo), and *Climacteris picumnus victoriae* (Brown Treecreeper) were recorded on the site.

Although no forest owl species were observed during targeted surveys, it is likely that the site represents a portion of the local foraging range of *Ninox connivens* (Barking Owl), *Ninox strenua* (Powerful Owl), and *Tyto novaehollandiae* (Masked Owl) due to the presence, or likely presence, of small terrestrial mammals and arboreal mammals, which are the prey of these owl species. Due to the low abundance of large hollow bearing trees on the site, it is less likely that these species breed on the site.

Herpetofauna

Six common reptilian species were recorded, including the *Lampropholis delicata* (Garden Sun Skink), *Chelodina longicollis* (Eastern Long-necked Turtle), *Egernia whitii* (White's Skink) and *Saiphos equalis* (Three-toed Skink).

A total of nine species of amphibian were identified within the site. Several common species were recorded including the *Litoria dentata* (Bleating Tree Frog), *Uperoleia laevigata* (Smooth Toadlet), *Lymnodynastes*

peronii (Striped Marsh Frog), *Lymnodynastes tasmaniensis* (Spotted Grass Frog), and *Crinia signifera* (Common Eastern Froglet).

9.5.6.3 Ecology Impact Assessment

A summary of the potential impacts assessed within the Ecological Assessment is provided below. The Ecological Assessment examined the likelihood of the Project to have a significant effect on any threatened species, populations or ecological communities listed under the TSC Act and EPBC Act and tables identifying the assessment of significance (7 Part Test under the TSC Act) and assessment of significance (EPBC Act) are contained in the Ecological Assessment in **Appendix 8**.

Vegetation

The area of removal of native vegetation as a result of the Project is summarised in **Table 51** below and includes consideration of the two locations of the proposed Link Haul Road, (Option 1– eastern alignment, and Option 2 – western alignment) as illustrated in **Figure 22**.

Table 51 Native Vegetation Communities

Native Vegetation Community	Area (ha) inclusive of Haul Road Option 1	Area (ha) inclusive of Haul Road Option 2
MU 11 Tableland Gully Snow Gum – Ribbon Gum Montane Grassy Forest	0	0.05
MU15 Tableland Hollows Black Gum – Black Sally Open Forest	0	0
MU 37 Coxs Permian Red Stringybark – Brittle Gum Woodland	10.47	10.62
Planted/Regenerating Vegetation	30.78	30.67
Phragmites Wetland	0.12	–
Total	**41.37**	**41.34**

It is noted that a road-side remnant of the EEC Tableland Gully Snow Gum – Ribbon Gum Montane Grassy Woodland has the potential to be impacted upon due to the positioning of one of the proposed routes of the services Link Haul Road (Option 2). The area to potentially be lost is in the form of a small (0.05ha) young stand of mostly *E. pauciflora*. This community exists as modified remnant roadside vegetation, which is only tentatively connected to other areas of commensurate vegetation. With regards to the principle of avoidance and mitigation, Link Haul Road (Option 1) may achieve this. However, due to the proximity of Link Haul Road (Option 1) to the main residential area of Blackmans Flat, achieving a suitable balance between the needs of the local community and the Project indicates that Link Haul Road (Option 1) may not be possible. Notwithstanding, due to the low quality of this vegetation, as noted above, and with better quality examples of this community retained on lands nearby, the loss of 0.05ha of modified Tableland Gully Snow Gum – Ribbon Gum Montane Grassy Woodland is not considered to be a significant impact.

Flora

Flora surveys have detected one threatened flora species, namely, *E. aggregata*. This species is outside the REA and is not likely to be impacted upon as a result of the proposed actions. Surveys within the site did not detect any further threatened flora species, however two are considered to have potential to occur, namely, *E. cannonii* and *T. australe*.

Eucalyptus aggregata (Black Gum)

This species was recorded within the Tableland Hollows Black Gum – Black Sally Open Forest. This community or the *E. aggregata* are not expected to be impacted upon by the proposal.

Eucalyptus cannonii (Capertee Stringybark)

Whilst not recorded, despite targeted surveys, this species is known to have been used in tree plantings as part of the revegetation works and therefore may exist as juvenile trees within the planted/regenerating vegetation recorded within the proposed disturbance footprint. *E. cannonii* may also occur within the Coxs Permian Red Stringybark – Brittle Gum Woodland community.

E. cannonii can only be identified separately from *E. macrorhyncha* by the fruit shape. Due to the young age of the vegetation within the rehabilitation areas, identifying this species separately to the closely related *E. macrorhyncha* was difficult during this survey. During targeted field surveys within the Coxs Permian Red Stringybark – Brittle Gum Woodland, only the fruit of *E. macrorhyncha* was recorded. If present within the woodland, *E. cannonii* is believed to occur in low numbers.

A local population of *E. cannonii* is known to occur throughout the neighbouring Ben Bullen State Forest and surrounds to the north and north-east of the site. 114 records were collected for this species during surveys of the Neubeck site directly north-east of the site (RPS 2013), and an additional 21 individuals were recorded within the Ben Bullen State Forest, representing only a portion of the actual population size present within the state forest (RPS pers. obs. 2011). It is likely that this species also exists within the areas of Ben Bullen State Forest that occur to the south of the site. Whilst it is considered likely that individuals of this species will be removed as part of the Planted/Regenerating Vegetation, these are deliberately planted individuals that are not yet mature. The Coxs Permian Red Stringybark – Brittle Gum Woodland also represents potential habitat for this species. However, despite targeted surveys, none were recorded therein. The total habitat area for this species within the site is approximately 128.97 ha, with the area of potential habitat to be impacted upon totalling 41.25 ha or 41.29ha for Link Haul Road Option 1 or Link Haul Road Option 2 respectively.

In addition, within the site, approximately 80% of the Coxs Permian Red Stringybark – Brittle Gum Woodland, and approximately 50% of the planted vegetation, will be retained. It is therefore considered that the proposal is unlikely to have an adverse effect on the life cycle of the *E. cannonii* such that a viable local population of the species will be placed at risk of extinction.

Thesium australe (Austral Toadflax)

T. australe has not been recorded within the site, however a population has been recorded in grasslands within the Neubeck site to the north-east of the site and is known to occur within the Pine Dale Coal Mine Stage 2 Extension Area, which is located to the immediate north of the site. 56 individual *Thesium australe* plants were recorded at Neubeck (RPS 2013) and 99 individual *T. australe* plants from 26 survey plots were recorded by Eco Logical Australia (2011). The *T. australe* plants at Neubeck were recorded within previously cleared grasslands dominated by the closely associated *Themeda australis* (Kangaroo Grass) whilst the species was observed by Eco Logical Australia within derived grassland of Stringybark/Scribbly Gum open forest. This vegetation community is a low open forest or woodland with an open understorey of sclerophyll shrubs, and sparse ground layer of grasses and forbs. This vegetation community is not represented within the Springvale Coal Services site.

Suitable habitat for *T. australe*, in the form of *T. australis* dominated grassland in low-lying areas was recorded within the site. Based on known nearby habitat attributes, the low-lying cleared land, adjacent to the Pine plantations, mapped within the far north-west of the Springvale Coal Services Site, contains potentially suitable habitat for this species. Despite targeted surveys, *T. australe* was not recorded. However, it is noted that populations are subject to quite extreme fluctuations from year to year (Victoria, Department of Sustainability and Environment, 2003). Link Haul Road (Option 2) may therefore impact upon a small area (approximately 0.21ha) of potential habitat for *T. australe*, albeit marginal. This potential habitat quality and potential for presence of *T. australe* is lessened by the past land use as pine plantation and the encroachment of *Rubus fruticosus* (Blackberry) within this area.

Fauna

The Project is expected to result in the removal of approximately 10.67 ha of forest based upon the preferred Link Haul Road option (Link Haul Road (Option 2)) as described in Section 8.1.1. This is considered to be suitable for the majority of fauna present, or potentially present within the site.

The surrounding state forests provide large areas of consolidated habitat for common and threatened fauna considered to have potential to occur within the locality. Whilst the removal of the vegetation on site is deemed to constitute a loss of habitat for threatened fauna, given the large amounts of neighbouring habitat, the proposal is not considered to constitute a significant reduction of habitat to locally occurring fauna.

9.5.6.4 Key Threatening Processes

Key Threatening Processes (KTPs) are listed under Schedule 3 of the TSC Act. There are five KTPs that have the potential to affect the Springvale Coal Services Site as a consequence of the Project, being:

- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands;
- Anthropogenic climate change;
- Clearing of Native Vegetation;
- Invasion of native plant communities by exotic perennial grasses;
- Competition and grazing by the feral European Rabbit;
- Loss of hollow-bearing trees; and
- Removal of dead wood and dead trees.

Alteration of the natural flow regimes of rivers, streams, floodplains and wetlands

The adjacent Wangcol Creek could be affected by the Project if mitigation measures are not implemented to ensure the safe storage and control of excess water flows from the Springvale Coal Services Site.

Monitoring of storage ponds is essential to ensure that the creek is not affected by the proposed works and that each pond is serving its purpose to hold excess water with no spills. The extent to which the Project could contribute to this process is considered unlikely to be significant, as long as precautionary measures are implemented and monitored regularly.

Overall the Project will provide opportunity to improve drainage with improved containment and reuse of water from worked areas and containment of sediments from worked and rehabilitated as well as natural/forested areas. Should the Project proceed, it is likely to be beneficial for downstream receiving water bodies as the amount of worked water leaving the site will be reduced. The total amount of sediment leaving the site will also be reduced as the separation of clean and worked water is made effective and the reuse of worked water increases. It is therefore considered that the Project will reduce worked water flows and increase clean water flows, with zero dirty/treated water discharge the future goal (RPS Aquaterra 2013).

Anthropogenic Caused Climate Change

The Project is likely to contribute to the KTP of “Anthropogenic Caused Climate Change” as a result of clearing of native and non-native planted vegetation. This process affects all threatened species that occur or potentially occur on site as the distribution of most species, populations and communities is determined, at least at some spatial scale, by climate. There is evidence that modification of the environment by humans may result in future climate change. Such anthropogenic change to climate may occur at a faster rate than has previously occurred naturally. Climate change may involve both changes in average conditions and changes to the frequency of occurrence of extreme events (OEH 2011). This is discussed further in Section

9.5.12 (Greenhouse Gas) of the EIS. The relatively small extent to which the Project could contribute to this process is considered unlikely to be significant however is considered as a cumulative impact.

Clearing of Native Vegetation

Clearing of native vegetation is recognised as a major factor contributing to loss of biological diversity. The Project will require the removal of a maximum of approximately 41.37 ha of native vegetation and as such will incrementally contribute to the KTP of "Clearing of Native Vegetation". This key threatening process is likely to affect most woodland fauna species, specifically the Gang-gang Cockatoo, Speckled Warbler and Brown Treecreeper as "Clearing of Native Vegetation" is listed as a key threatening process to their survival. Even though this process is considered to be detrimental to a number of threatened species in the site's local vicinity, the extent to which the proposal could contribute to this process is considered unlikely to be significant. It should however be considered as a cumulative impact in regards to other projects occurring in the district.

Invasion of native plant communities by exotic perennial grasses

Exotic perennial grasses have the potential to adversely affect native plant communities and native species. This KTP is potentially relevant to *T. australe*, the Speckled Warbler and the EEC Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland. This KTP may be exacerbated along the edges of those areas proposed to be cleared, however none of the EEC is proposed to be cleared. Additionally no populations of *T. australe* or Speckled Warbler have been recorded on site. Therefore the extent to which the Project could contribute to this process is considered unlikely to be significant.

Competition and grazing by the feral European Rabbit

The European Rabbit (*Oryctolagus cuniculus*) is known to degrade and negatively impact native vegetation and compete with native fauna for resources such as food where niches with native species overlap (OEH 2011). The threatened plant *T. australe* is regarded to be negatively affected by competition of the European Rabbit as it reduces survival and recruitment of seedlings. By removing above-ground and below-ground vegetation, feral rabbits contribute to erosion and loss of topsoil by wind and rain. This form of land degradation reduces the chance of successful establishment of indigenous plants, and increases the susceptibility of many indigenous vertebrates to predation from feral predators (Morton 1990; Dickman 1993). The Project is however unlikely to contribute to the KTP as the increased activity within the Springvale Coal Services Site would act as a deterrent and reduce available habitat for Rabbits. Therefore the extent to which the Project could contribute to this process is considered unlikely to be significant.

Loss of hollow-bearing trees

A number of threatened fauna species identified to potentially occur within 10km of the Springvale Coal Services Site are reliant upon hollow-bearing trees for roosting and breeding purposes, including the Squirrel Glider, threatened forest owls and hollow-dependent insectivorous bats. Although the vegetation on the Springvale Coal Services Site is lacking in large hollows considered most suitable for larger fauna species including the Powerful Owl, the Project will result in the removal of between 10.47 and 10.62 ha of vegetation (depending on haul road option chosen), that includes smaller hollow-bearing trees and as a result will contribute to this KTP.

Removal of dead wood and dead trees

The removal of dead wood and dead trees can result in the diminishing of habitat for shelter and foraging for several threatened species. Most relevant to the Project may be Brown Treecreeper (eastern subspecies), which use this habitat feature for foraging. The Project will require the removal of 10.47 and 10.62 ha of

vegetation (depending on haul road option chosen), which includes dead trees or ground debris and as such will contribute to the KTP "Removal of Dead Wood and Dead Trees" in a small capacity.

9.5.6.5 Considerations under the Environment Protection and Biodiversity Conservation Act 1999

The Ecological Assessment also considered relevant matters under the EPBC Act 1999. An EPBC Act Protected Matters Search was undertaken within the SEWPaC on-line database (accessed 2012) to generate a list of those MNES from within 10km of the site, which may have the potential to occur within the site. This data, combined with other local knowledge and records, was utilised to assess whether the type of activity proposed on the site will have, or is likely to have a significant impact upon a MNES, or on the environment of Commonwealth land.

The Ecological Assessment concluded that the Project will not impact on MNES and therefore a referral to the Commonwealth SEWPaC is not considered necessary as MNES are not likely to be significantly impacted.

9.5.6.6 Consequences of Potential Ecology Impacts

Overall there were no significant impacts identified on vegetation communities or threatened flora and fauna according to the Ecological Assessment. The Project is proposed within an existing disturbance footprint that has been heavily modified over a long period of time and there is adequate retention of communities consistent with those found in Ben Bullen State Forest. The progressive rehabilitation of the Lamberts Gully drainage line will provide habitat linkage to the Ben Bullen State Forest and adjoining remnant vegetation and therefore there are no expected consequences from the Project based on the Ecological Assessment findings.

9.5.6.7 Proposed Biodiversity Strategy

The majority of proposed clearing associated with the Project is within existing rehabilitation areas of the Springvale Coal Services Site, which will be rehabilitated taking into consideration the vegetation communities in the surrounding Ben Bullen State Forest, as per the existing and revised rehabilitation strategy for the Project. The proposed biodiversity strategy takes into account the rehabilitation initiatives provided in the Lamberts Gully Project Approval as well as measures specific to the proposed Western Coal Services Project. These rehabilitation initiatives provided in the Lamberts Gully Open Cut Approval are in conjunction with rehabilitation activities associated with the improved separation of clean and dirty water systems. This work provides for the rehabilitation of all remaining areas that are not covered by ongoing operations of the Springvale Coal Services Site.

The Project will involve the removal of approximately 10.5 ha of Coxs Permian Red Stringybark - Brittle Gum Woodland. Less than 0.3 ha will be cleared during construction of the Link Haul Road while the remaining will be disturbed at around year 10 of the REA development.

Centennial is developing a regional biodiversity offset strategy in close consultation with OEH which will cover a number of projects in the Western Coalfield including the Western Coal Services Project. OEH has indicated that it has a preference for a regional approach rather than individual strategies for each project as a regional package would yield greater environmental benefits. Consultation on the regional strategy is ongoing.

It is proposed to undertake riparian planting for a 100 m section of Wangcol Creek downstream of the Link Haul Road crossing. This will be undertaken following completion of construction and under the supervision or direction of a qualified aquatic ecologist. As described elsewhere in this EIS and in the Aquatic Ecology Assessment contained in **Appendix 9**, Wangcol Creek is highly disturbed and lies predominantly within a constructed channel near where the proposed haul road link will cross. It is the existing lack of riparian

vegetation that reduces its habitat value for fish and aquatic macro invertebrates rather than the direct impacts caused by the road crossing. Without limiting the ultimate planting design, it is proposed establish a self-sustaining community consisting of Tall Spikerush *Eleocharis sphacelata,* Jointed Rush *Juncus articulate*s Common Reed *Phragmites australis* and *Cumbungi* for a distance of 100 m downstream of the new haul road link crossing. The purpose of this work is to provide an overall improvement to the habitat value of Wangcol Creek as natural expansion of the new plantings will gradually spread further downstream.

There are proposed additional land management initiatives for the existing vegetation communities within and surrounding the Springvale Coal Services Site. A small portion of the Ben Bullen State Forest, approximately 30 hectares, is within the PAA. The Project will undertake an ongoing weed management program involving at least annual inspections for weeds and undertaking weed control works as required for the life of the Project. The program will also include feral animal controls in consultation with Forests NSW.

The combination of a land management strategy, rehabilitation strategy and inclusion of the Project in a regional biodiversity offset strategy will achieve biodiversity outcomes in a heavily modified environment commensurate with the impacts proposed by the Project.

9.5.6.8 Mitigation and Management Measures

The following mitigation measures have been recommended to minimise potential impacts of the Project:

- The minimum amount of clearing will take place as a general objective of the Project;
- Measures be implemented to avoid impacts upon waterways and associated vegetation resulting from soil disturbance, namely, adequate erosion and sedimentation controls with regular monitoring to ensure their functionality and condition;
- Ongoing weed monitoring be instituted, with potential weed infestations being appropriately managed to ensure surrounding communities are protected from invasive species; and
- *Eucalyptus cannonii* is used in the planting mix for rehabilitation, following the decommissioning of the REA.

9.5.6.9 Conclusion

The Project will remove approximately 41.34 ha (Link Haul Road Option 2 plus enlarged REA) of native vegetation in order to provide the infrastructure associated with the Project. The proposed REA has been designed to generate the minimum impact to significant surface features. After due consideration of the relevant assessment of significance criteria (7 Part Test) under the TSC Act the Ecological Assessment states that the Project is expected to have minimal impacts on the ecology of the site. The Project will not impact on the management and biodiversity values of the Ben Bullen State Forest but the progressive rehabilitation of the Lamberts Gully drainage line will provide habitat linkage to the forest and adjoining remnant vegetation.

This Assessment has also examined the likelihood of the Project to have a significant effect on any threatened species, populations or ecological communities listed under the TSC Act and EPBC Act. These Assessments have concluded that no significant impacts are likely to relevant threatened species or EECs listed under the TSC Act 1995, or MNES (EPBC Act 1999).

9.5.7 Aquatic Ecology

9.5.7.1 Introduction

The Project BBRA and subsequent environmental and stakeholder risk assessment, as discussed in Section 9.1.3, considered the potential impacts of the Project on the aquatic values of water courses, with particular

regard given to Wangcol Creek, and categorised the likely Project works to be a *moderate risk*. A plan showing the location of Wangcol Creek and its subcatchments is found in **Figure 33**.

As a result of the identification of the potential risks, and in order to address the DGRs issued for the Project, Marine Pollution Research was engaged to prepare an Aquatic Ecology Assessment. A copy of the Aquatic Ecology Assessment is contained within **Appendix 9,** and significant findings and recommendations from the Assessment are summarised below. Similarly, findings and recommendations relevant to the Aquatic Ecology Assessment within the Geomorphological Impact Assessment, contained in **Appendix 5,** are also incorporated below.

The prime task of the Aquatic Ecology Assessment is to determine whether there are any listed species or endangered ecological communities (EECs), as identified under State and Commonwealth legislation, either within the study area or in areas that could be impacted by the Project. Species and EECs are listed under the FMA and the Commonwealth EPBC Act.

Assessment for Threatened Aquatic Species and for Aquatic Biodiversity is undertaken following the OEH Draft Guidelines for Threatened Species under Part 3A of the EP&A Act 1979, and the NSW DPI Fisheries Policy and Guidelines – Aquatic Habitat Management and Fish Conservation, as specified in the DGRs. One of the objectives of the FMA is to 'conserve KFH which are aquatic habitats that are important to the sustainability of the recreational and commercial fishing industries, the maintenance of fish populations generally, and the survival and recovery of threatened aquatic species. Accordingly, the Aquatic Ecology Assessment considers how KFH's are to be conserved. The Aquatic Ecology Assessment also considers how any necessary impacts can be minimised, mitigated, or offset as per the DPI Fisheries' Guidelines (NSW Fisheries 1999a,b).

DPI Fisheries has produced a series of KFH maps based on local government boundaries. These indicate that the Coxs River, Wangcol Creek, and the two sub-catchment drainages to Wangcol Creek from the Springvale Coal Services Site, are defined as KFH. A plan showing the location of Wangcol Creek and Coxs River is found in **Figure 29**, and a plan showing the sub-catchment drainage areas to Wangcol Creek is found in **Figure 33.**

Additionally, the Aquatic Ecology Assessment considers aquatic biota, or assemblages, that are groundwater dependent, and the guidelines associated with the protection of potential GDEs, as set out in the NSW State Groundwater Dependent Ecosystem Policy (2002). Where relevant, the following additional guidelines have been taken into account in the Aquatic Ecology Assessment:

- DEC/DPI (2005) Draft Guidelines for Threatened Species Assessment under Part 3A of the EP&A Act;
- OEH Website based Survey and Assessment guidelines. (http://www.environment.nsw.gov.au/threatenedspecies/surveymethodsfauna.htm#1);
- AMBS (2011) Survey guidelines for Australia's threatened fish;
- DLWC (2002) NSW State Groundwater Dependent Ecosystem Policy;
- NSW Fisheries (1999a) Policy and Guidelines – Aquatic Habitat Management and Fish Conservation;
- NSW Fisheries (1999b) Policy and Guidelines – Fish Friendly Waterway Crossings; and
- Rutherford et al (2000) A Rehabilitation Manual for Australian Streams.

The Aquatic Ecology Assessment has included input from current, and ongoing, assessments of water quality discharged from the site, studies within the mixing zone of Wangcol Creek, and eco-toxicology testing. The Assessment has also included an investigation into the aquatic ecology of upper sections of both Lamberts Gully and Huon Gully, which originate from the Ben Bullen State Forest, above the Springvale Coal Services Site. The Aquatic Ecology Assessment has also been prepared with reference to the Water

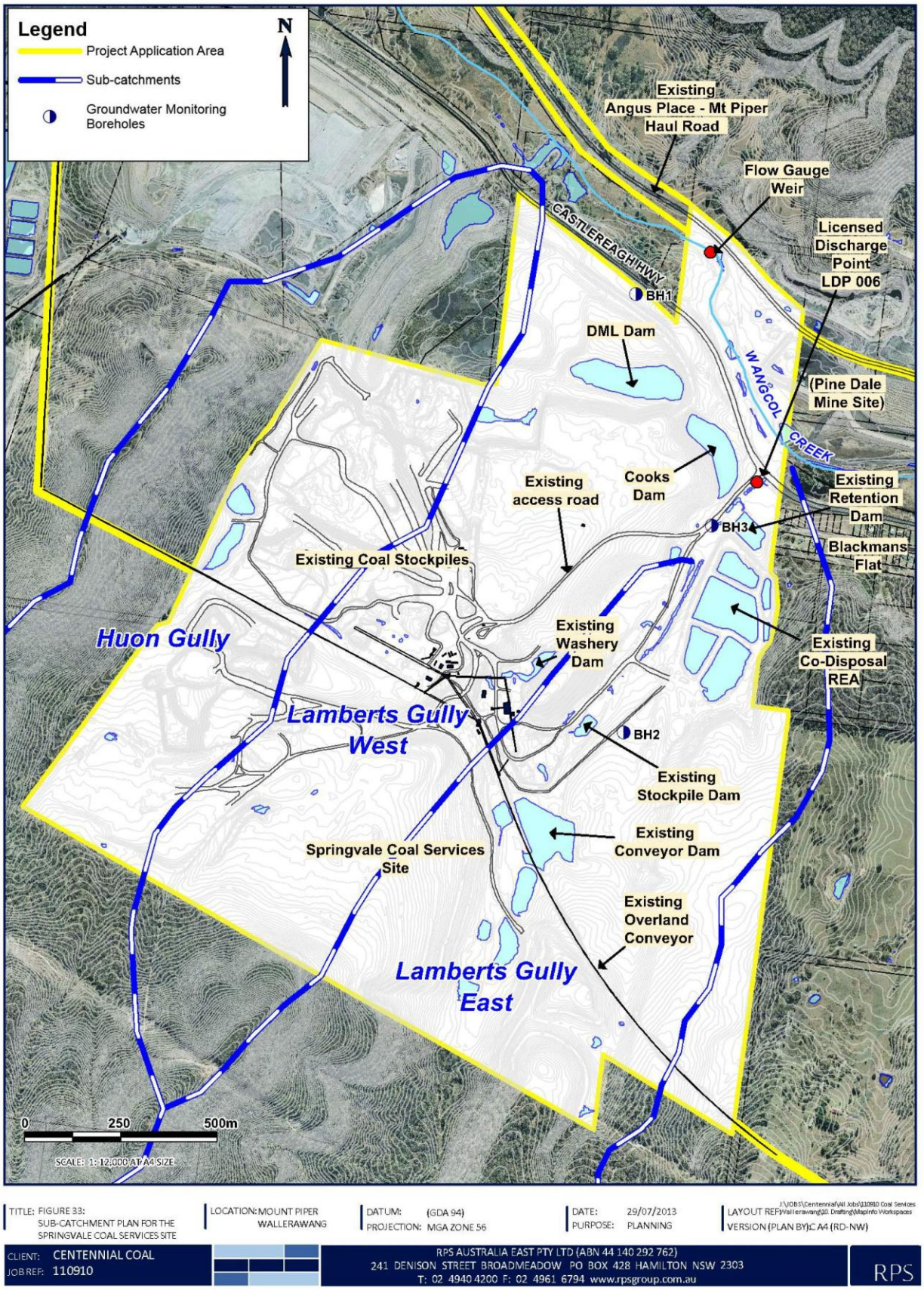
Balance and Surface Water Impact Assessment of the EIS, as discussed in Section 9.5.3 and the Groundwater Assessment of the EIS, as discussed in Section 9.5.4.

9.5.7.2 Existing Situation

Both the Lamberts Gully and Huon Gully drainage lines commence in a relatively undisturbed forested area to the south and southwest of the site. The Huon Gully passes along the western edge of the site and into a dam downstream of the overland conveyor. From here, the Huon Gully is diverted through a formed channel and, ultimately, into an old mining void adjacent to the Castlereagh Highway. This system is controlled by Delta Electricity and forms part of the drainage system for the ash emplacement. Lamberts Gully rises on the south-eastern escarpment of Mt Piper.

Figure 33 indicates the location of the relevant sub-catchments for the Springvale Coal Services Site. The lower section of Lamberts Gully first passes through the Existing Conveyor Dam, which is crossed by the overland conveyor and generally drains around the Washery and stockpile area, this bypasses the stockpile pollution control dam and, ultimately, flows into the Retention Dam at the base of the site. Overflow from this dam may be combined with water discharged from Cooks Dam prior to entering Wangcol Creek via the current LDP 006.

Figure 33 Sub Catchment Plan



Existing and potential Aquatic Ecology impacts of the Springvale Coal Services Site are related to the existing and proposed activities, including water management improvements over the last 10 years, on the Springvale Coal Services Site. Relevant to the Aquatic Ecology Assessment is the overview of the history of disturbance of the Springvale Coal Services Site, the existing environment and the scope of water management studies discussed in Section 9.5 of the EIS.

The Geomorphological Assessment, as provided in **Appendix 5**, describes Wangcol Creek as transitioning from a valley fill system to a channelised fill system at the eastern boundary of the Springvale Coal Services Site. A valley fill system is a featureless valley floor surface that lacks a well-defined channel, which can include a poorly defined low flow channel and occasional ponds. The channelised fill systems along Wangcol Creek are located at the farthest upstream and downstream extents of the Springvale Coal Services Site. At the eastern boundary, it is suspected that this reach of the creek is an excavated channel to allow for the diversion of Wangcol Creek away from the adjacent mining activities associated with the original Wallerawang Colliery and now Pine Dale Mine.

Due to the relatively disturbed nature of the Springvale Coal Services Site resulting from past mining and agricultural practices, Wangcol Creek is considered to be in moderate to poor geomorphic condition. Poor condition reaches are associated with the Channelised Fill sections of Wangcol Creek. All other sections are considered to be in moderate geomorphic condition.

Ecotoxicological testing of Wangcol Creek was undertaken in July 2011. The results of the testing have been considered in the Aquatic Ecology Assessment with results finding discharge from the Springvale Coal Services Site presented significant toxicity to the very sensitive cladoceran (*Ceriodaphnia dubia*), the microalga (*Selanastrum capricornutum*) and the duckweed (*Lemna disperma).* This toxicity can be attributed, in part, to the EC and concentrations of boron, manganese, nickel and zinc. Even though the toxic effects of metals can be additive, it would seem that there may be other factors in the discharge water which are contributing the majority of the toxicity. The test work also identified that there was little or no toxicity found at the edge of the mixing zone. Further testing will be undertaken to verify the anticipated improvements in water quality leaving the site, as well as to identify any other factors which may be impacting on aquatic value of the receiving waters.

9.5.7.3 Aquatic Ecology Impact Assessment

The main features of the Project that have the potential for direct impact on aquatic habitats are related to contaminated water runoff from the construction works into Wangcol Creek. The main contaminant of concern arising from construction works is sediment in the form of high TSS loads that could smother creek aquatic habitats and biota, or as turbidity that could inhibit photosynthesis of aquatic plants.

The main potential mechanisations of TSS and turbidity generation to Wangcol Creek from construction are as follows:

New and Upgraded Washery Plant

Construction of facilities for the new Washery plant, and upgrades to the existing Washery, will require earthworks. These works have the potential to impact on shallow groundwater quality and give rise to issues relating to overburden storage, and surface water and sediment runoff control.

New Rejects Emplacement Area

The proposed new REA, located south of the existing conveyor, as shown on **Figure 7** in Section 4 of the EIS, will rise from RL 930 at its lowest point in the north-east corner, to RL 1000 in the centre of the REA. It will be approximately 1km long and approximately 700m wide. Site preparation will require additional road works to allow traffic to access the site and management of surface runoff from the site will require

construction of a purpose built dirty water management system. These works are located alongside Lamberts Gully with direct stormwater drainage to the Gully.

New Link Haul Road

The Aquatic Ecology Assessment considered the two proposed haul road options as illustrated in **Figure 22**. Both of these options cross over Wangcol Creek, and both will require extensive earthworks for road construction. There are potential direct impacts to Wangcol Creek's aquatic biodiversity if fish passage or creek habitat and hydraulic functions are not suitably protected by the provision of an adequately sized crossing, further, there are potential indirect impacts from sedimentation and smothering from the associated earthworks. These works will require suitable bunding to prevent suspended solids entering the creek. Suitable bridging, to facilitate stormwater flow through Wangcol, will be requried. This bridging will also help to protect the existing aquatic ecological habitats within the creek.

In relation to Option 2 (the western alignment), illustrated in **Figure 22**, this option would cross Wangcol Creek at a point where the creek exists in a channelised fill section. The channel is stable at between 10 to 15 m wide and up to 1.5 m deep and is generally incised to shale bedrock. There is little or no riparian, or emergent, vegetation. It is anticipated that some stream edge erosion protection would be required in the form of rock gabions. The design of the crossing would need to accommodate peak flows from flood events without adversely scouring the creek line downstream of the culvert. Likewise, the design will need to ensure that the present fish passage attributes are protected or improved (see also NSW Fisheries 1999b).

In relation to Option 1 (the eastern alignment), illustrated in **Figure 22**, this option would cross Wangcol Creek in an area where the creek has been diverted around the original Wallerawang Colliery surface infrastructure (now Pine Dale Mine). The channel has been excavated into bedrock consisting of shales and sandstones. As with the western option, the creek would be crossed in a stable section and the design of the culvert beneath the new Link Haul Road would need to be designed to accommodate peak flows from flood events. It is also anticipated that some downstream erosion protection would be required to protect the creek from scour. As is detailed and assessed in other sections of this EIS, the preferred Link Haul Road is Option 2 (the western alignment). Regarding the aquatic impact assessment, this option will have the potential for impact, however, these impacts will be minimised with the implementation of the following measures:

- Erosion controls will be installed as part of the construction program along with normal sediment containment systems, such as ponds and silt control fencing. Once the road batters are formed they will be re-vegetated and stabilised. The erosion and sedimentation controls would remain until the batters are considered stable and soil movement minimal;
- Excavation of the topsoil and subsurface fill either side of the Wangcol Creek channel in order to provide a stable base for the new road embankment. The topsoil will be stockpiled away from the channel and protected by silt control fencing, while the fill will be tested for suitability of use within the road embankment. Additional fill will be sourced from the old open cut areas at the Springvale Coal Services Site; and
- All erosion and sedimentation controls will be designed and installed in accordance with a Project CEMP. The creek crossing will be designed to conform to the design guidelines for a Class 2 Moderate Fish Habitat, as detailed in NSW Fisheries 1999b.

Upgraded Water Management System

The upgraded Washery and use of the new REA on the Springvale Coal Services Site will increase the overall water demand of the site and this will necessitate an upgrade of the existing water management system. The main upgrading relates to the progressive separation of water from the Lamberts Gully drainage line, which flows through the site. At present, this water passes through two dam structures, the Conveyor Dam and the Stockpile Dam. It also receives treated overflow water from Cooks Dam and various smaller dam structures below the processing area.

The upgrade of the Washery, workshops, and infrastructure will require construction of new channels, the refurbishment of existing channels, and the construction of additional pipeworks. The design would also need to cater for Delta Electricity's proposed diversion of Huon Gully into Lamberts Gully upstream of the Springvale Coal Services Site. These upgrades require extensive earthworks that will themselves require suitable bunding to prevent suspended solids entering the creek downstream.

Operational Impacts

In addition to increased TSS and turbidity associated with site runoff, potential contaminants of concern arise from the operational site water runoff associated with coal dust, coal spillages from trucks, and hydrocarbon residues (fuel and oil spills). This will necessitate additional site works to ensure improved separation and treatment of site related runoff, including diversion of catchment drainages and off-site related stormwater diversions around the site to Wangcol Creek. In addition, the current EPA licence review process for the Springvale Coal Services Site is providing the main mechanism for progressive improvements in overall site, and diversion, water quality. This process will be ongoing and will result in positive impacts on Wangcol Creek through better control of licensed discharges and better provision of clean diversion waters to the creek.

Impacts during Rehabilitation Works

A number of rehabilitation works are planned to improve overall water management on, and off, the Springvale Coal Services Site. However, there are also potential disturbance impacts on riparian and aquatic habitats from stabilisation works along the watercourses. The control of these impacts generally relates to the prevention of disturbed soils from reaching the water courses during storms via suitable silt fencing and the stabilisation of new banks with staged planting – including initial fast growth grasses that can hold banks until the slower growing native species have taken hold. A single Rehabilitation Plan will be prepared for the entire PAA, including the Kerosene Vale Stockpile Area, as part of the Project.

9.5.7.4 Consequences of Potential Aquatic Ecology Impacts

Provided the construction is managed in a manner that prevents contaminated waters (including turbid waters) reaching Wangcol Creek, and that the haul road creek crossing does not interfere with creek hydraulic function or creek aquatic habitat diversity, there will be minimal construction impacts on the existing Wangcol Creek aquatic biodiversity. Further, the proposed upgrade of the water management system aims at a better separation of Lamberts (and Huon) Gully upper catchment runoff water from the Springvale Coal Services Site water management system and has the potential to provide an improvement for aquatic biodiversity in Wangcol Creek.

The Aquatic Ecology Assessment notes that construction will be managed via a CEMP that will include construction related stormwater diversion around the site and the collection, storage and treatment of construction site related waters (including potentially contaminated groundwater from the excavations) – with possible discharge of treated waters to Wangcol Creek. There will need to be separate treatment streams for site construction surface stormwater and site groundwater collection and treatment. These measures would be outlined in future surface and groundwater water management reports and will be detailed in the CEMP.

Once the Project has been completed and is operational, the demand for water will increase, even with additional water recoveries and recycling. However, the volume of water discharged on average will reduce and will be via a new LDP on the spillway of Cooks Dam. As the site further separates clean water from the upper catchment of Lamberts Gully, allowing it to flow through the site with minimal input from disturbed areas, it is anticipated that the overall quality of the water leaving the site will improve. This in turn will have positive implications on aquatic ecological systems within Wangcol Creek.

9.5.7.5 Aquatic Ecology Mitigation Measures

The main mitigation strategy relies on the improvement of water quality leaving the site. Mitigation measures have been developed as contained in Section 9.5.3.6 for surface water impacts. These mitigation measures are relevant and appropriately address the Aquatic Ecology impacts identified within the Aquatic Ecology Assessment.

9.5.7.6 Aquatic Ecology Monitoring

Management for aquatic ecology will form part of the single Water Management Plan that will be prepared for the entire PAA and will detail the basis for monitoring programs to be undertaken and these programs will build on monitoring studies already undertaken for the Western Coal Services Project.

As part of the Water Management Plan an Aquatic Ecology Monitoring and Management Program will be implemented, and be termed 'Aquatic Ecology (Streamhealth) Monitoring Program'. The program will incorporate the existing aquatic ecology study sites and data, alongside data from on-going studies to provide base-line data against which changes that may be attributable to construction or operation of the Springvale Coal Services Site can be measured.

9.5.7.7 Conclusion

The Springvale Coal Services Site has a number of existing site water management measures in place. The proposed works on the Springvale Coal Services Site, coupled with improved site water management measures, creek riparian and stream bank stabilisation, and vegetation management measures will result in an overall improvement in water quality and aquatic habitat condition for the benefit of the aquatic biota in Wangcol Creek adjacent to the site and for fish passage past the site.

The proposed works will maintain and improve both the KFH, and Class 2 features of Wangcol Creek, and of the Coxs River below the confluence.

The environmental outcomes of the Springvale Coal Services Site construction, operation, and remediation programs will be specified in the single Water Management Plan for the entire PAA and will incorporate all aspects of environmental control, including aquatic ecology. An aquatic ecology monitoring program incorporating the base-line data from present studies will be undertaken as part of the Water Management Plan and will enable the development of site specific trigger values based on ANZECC 2000 Guidelines for Wangcol Creek.

9.5.8 Visual Impact

9.5.8.1 Introduction

The BBRA considered that visual issues resulting from the Project were a moderate risk and that a specialist visual assessment would be required. RPS was engaged by Springvale Coal to undertake a Visual Impact Assessment (VIA) for the Springvale Coal Services Site components of the Project. A copy of the Assessment is contained within **Appendix 10**. The VIA addresses the visual context of the site and any potential visual impacts resulting from the project, thus informing the design of the Project and identifying visual impacts and mitigation measures.

9.5.8.2 Existing Environment

The area surveyed for the VIA included the 1.8km x 2.3 km area surrounding and including the Springvale Coal Services Site. The survey area was located in a valley surrounded to the north-south and west by ridgelines, with the valley itself extending to the east. The site and its surrounds are dominated by extractive industries and power generation. The site sits amidst three mines, Angus Place Colliery to the north-east,

Springvale Coal Mine to the south-east, and Pine Dale Mine to the north. The Mt Piper Power Station is located to the north-west. The point at which Springvale Coal Services Site meets the Castlereagh Highway is shielded from view by existing trees and vegetation, as well as a significant embankment at the edge of the highway corridor. Immediately to the east of the site is Blackmans Flat, comprising approximately 14 dwellings that house approximately 30 people. A further 3.7 km to the east is Lidsdale, which has distant, but interrupted, views towards the Site.

A plan illustrating the Topographic Relief of the VIA study area and points where photographs were taken is found in **Figure 34**. Photograph panoramas for Photograph Point 3, Point 8 and Point 10 showing the view to the Springvale Coal Services Site, are located in **Figure 35.**

9.5.8.3 Visual Impact Assessment

A view-shed model was created to assist with determining the visual catchment of the proposed elements at the Springvale Coal Services Site. This model assists the VIA process by depicting spatially where elements may be visible in the landscape. These areas were further explored by field inspection which included the generation of:

- Panorama pictures where the position of elements are nominated on the panorama; and
- Montages where it is considered that visual impacts may result from a full, or partial, view of one or more elements.

For the purposes of the initial view-shed model, the mapped vegetation is assumed to be entirely opaque – as the vegetation mapping only includes stands of trees large enough to likely block the entire view. A map showing the initial view-sheds is found in **Figure 36.** This map provides a visual representation of what elements of the Project are likely to be seen from lands around the site. Any colour on the map represents a point at which part, or all, of the development will be visible. The model reveals that, in close proximity to the site, some components within the Springvale Coal Services Site may be visible from Blackmans Flat.

Key visual receptors were found to be to the east of the Springvale Coal Services Site, where views to and across the site are likely, and where dwellings are located in the Blackmans Flat and Lidsdale localities. Views of proposed elements from the Castlereagh Highway corridor are also considered important due to its being regarded as a tourist route.

Figure 34 Topographic Relief of the VIA Study Area

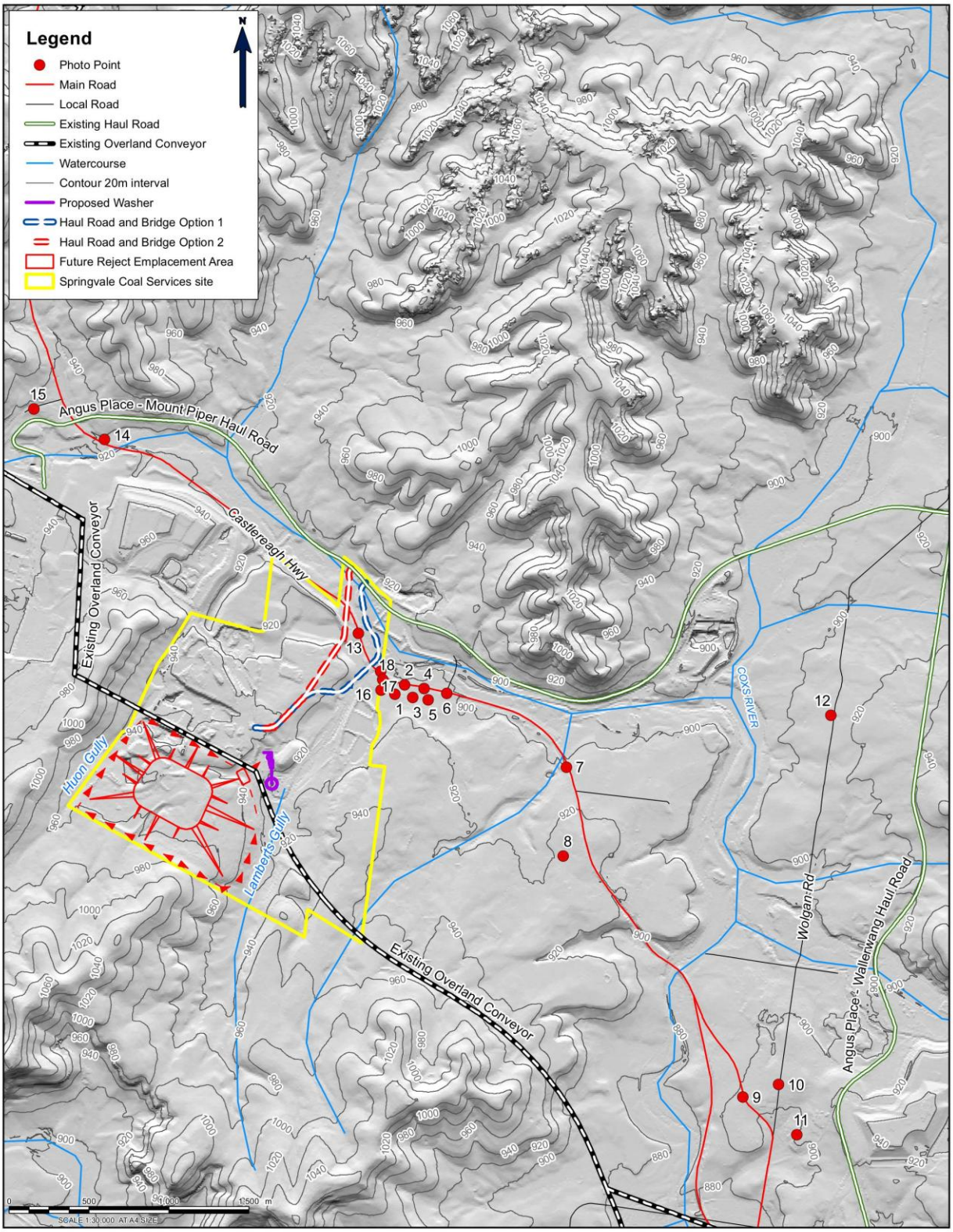


Figure 35 Photo Panoramas

Extended Reject Emplacement Area (REA)

The extended REA is located to the rear of the Springvale Coal Services Site and will, on finalisation, be approximately RL 930 at the north-east corner and RL 1000m at the top of the REA. It is envisaged that the mound will facilitate the management of reject for approximately 25 years before it reaches its proposed height. The REA will potentially have the most wide ranging visual impact, as the view-shed model denotes it will be seen from various points in the landscape particularly to the east. The view-shed model reveals that views of the REA from the Castlereagh Highway will be possible at several locations, however, these view lines will be reduced in reality by any significant tree growth and roadside vegetation which have not necessarily been included in the model.

The montage pictures contained in **Figure 37** to **Figure 41** depict the potential view lines to the proposed elements on the Springvale Coal Services Site from Blackmans Flat and Lidsdale localities. The montages show the following:

- The REA is largely shielded from the viewpoints within Blackmans Flat (**Figure 37** and **Figure 39**);
- The REA can be viewed from the Pine Dale Mine access point (**Figure 40**), however, existing trees will successfully screen the majority of its visual impact – as demonstrated by the montage; and
- Part of the REA can be viewed from long distance (**Figure 41**), but this is not expected to significantly alter the view or horizon, particularly once rehabilitation works have taken place upon the completion of its service life.

Existing Co-Disposal REA

The existing Co-Disposal REA is located to the south of residents in Blackmans Flat, as can be seen in **Figure 5** in Section 3 of the EIS. As part of the Project, this area will only be used during periods of maintenance or emergency. The area would be available for partial covering and rehabilitation work that may necessitate laying an additional capping layer over the tailings ponds. At least one pond, with a possible second, will be left open for use as required. The rehabilitation work will involve raising the existing height by around 2 m to create a stable landform. This would result in some minor additional visual impacts on Blackmans Flat from the western most end of the locality. Living areas and private outdoor entertaining spaces of residences are not expected to be impacted by this minor mound. Due to the minor nature of this mound it was not modelled in the view-shed model.

Figure 36 Initial View Sheds

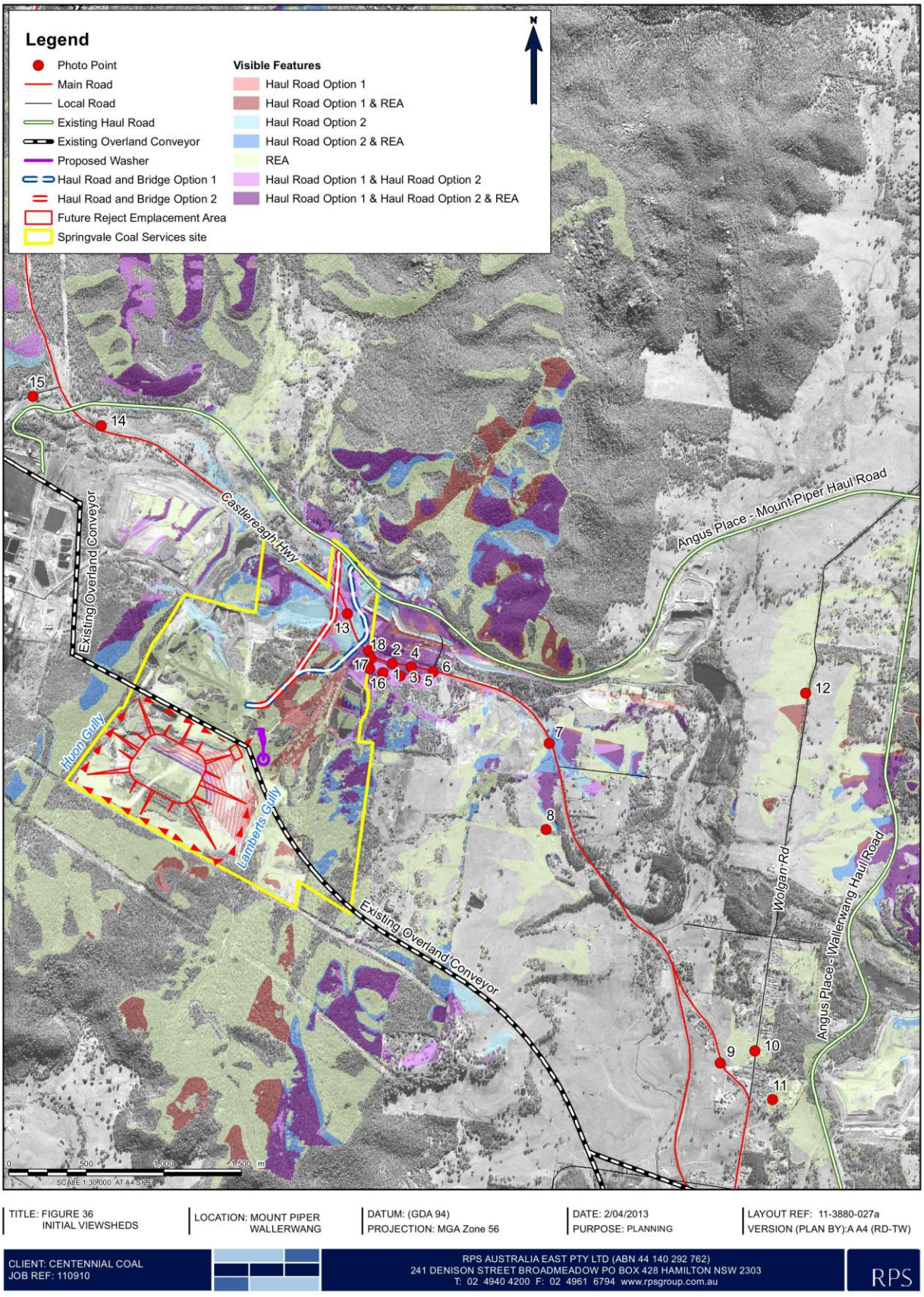


Figure 37 Photo Montages – Photo Point 3

View from photo point 3 - pre construction

View from photo point 3 - post construction

Zoomed view from photo point 3 - pre-construction

Zoomed view from photo point 3 - post-construction

TITLE: FIGURE 37: PHOTOMONTAGES PHOTO POINT 3
LOCATION: MOUNT PIPER WALLERAWANG
DATUM: (GDA 94)
PROJECTION: MGA ZONE 56
DATE: 29/07/2013
PURPOSE: PLANNING
LAYOUT REF: I:\JOBS\Centennial\All Jobs\110910 Coal Services Wallerawang\10. Drafting\MapInfo Workspaces
VERSION (PLAN BY): A A3 (RD-NW)
CLIENT: CENTENNIAL COAL
JOB REF: 110910

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

Figure 38 Photo Montages – Photo Point 18

View from photo 18 - pre - construction

View from photo 18 - post - construction Bridge Option 2

View from photo 18 - post - construction Bridge Option 1

Zoomed view from photo 18 - pre - construction

Zoomed view from photo 18 - post - construction Bridge Option 2

Zoomed view from photo 18 - post - construction Bridge Option 1

TITLE: FIGURE 38: PHOTOMONTAGES PHOTO POINT 18
LOCATION: MOUNT PIPER WALLERAWANG
DATUM: (GDA 94)
PROJECTION: MGA ZONE 56
DATE: 29/07/2013
PURPOSE: PLANNING
LAYOUT REF: J:\JOBS\Centennial\All Jobs\110910 Coal Services Wallerawang\10. Drafting\MapInfo Workspaces
VERSION (PLAN BY): A A3 (RD-NW)
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Figure 39 Photo Montages – Photo Point 16

View from photo point 16 - pre-construction

View from photo point 16 - post-construction

Zoomed view from photo point 16 - pre-construction

Zoomed view from photo point 16 - post-construction

TITLE: FIGURE 39:
PHOTOMONTAGES PHOTO POINT 16

LOCATION: MOUNT PIPER
WALLERAWANG

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 29/07/2013
PURPOSE: PLANNING

LAYOUT REF: I:\JOBS\Centennial\All Jobs\110910 Coal Services Wallerawang\10. Drafting\MapInfo Workspaces
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Figure 40 Photo Montages – Photo Point 17

View from photo 12 - pre-construction

View from photo 12 - post-construction

Zoomed view from photo 12 - pre-construction

Zoomed view from photo 12 - post-construction

TITLE: FIGURE 41: PHOTOMONTAGES PHOTO POINT 12
LOCATION: MOUNT PIPER WALLERAWANG
DATUM: (GDA 94)
PROJECTION: MGA ZONE 56
DATE: 29/07/2013
PURPOSE: PLANNING
LAYOUT REF: J:\JOBS\Centennial\All Jobs\110910 Coal Services Wallerawang\10. Drafting\MapInfo Workspaces
VERSION (PLAN BY): A A3 (RD-NW)

CLIENT: CENTENNIAL COAL
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Figure 41 Photo Montages – Photo Point 12

View from photo 12 - pre-construction

View from photo 12 - post-construction

Zoomed view from photo 12 - pre-construction

Zoomed view from photo 12 - post-construction

TITLE:	FIGURE 41: PHOTOMONTAGES PHOTO POINT 12	LOCATION:	MOUNT PIPER WALLERAWANG	DATUM: PROJECTION:	(GDA 94) MGA ZONE 56	DATE: PURPOSE:	29/07/2013 PLANNING
LAYOUT REF: VERSION (PLAN BY):	J:\JOBS\Centennial\All Jobs\110910 Coal Services Wallerawang\10. Drafting\MapInfo Workspaces A A3 (RD-NW)						

CLIENT: CENTENNIAL COAL
JOB REF: 110910

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New Coal Washery and Associated Infrastructure

The existing Washery and rejects bin is an element not easily viewed from a distance. The skyline tripper, which is the highest point of the coal conveyor, can be seen from various points in the middle (1 – 2km) to long distance (over 2 km). The proposed additional Washery will be co-located east of the existing Washery and will be of the same height. The rejects bin will be visible from the surrounding elevated vantage points but are unlikely to be viewed from any private receptors.

Plate 1 shows the photo taken from Wolgan Road and depicts the existing overhead gantry (main coal conveyor from Springvale Colliery), Mt Piper Power Station stacks, and the point for which the major REA is proposed.

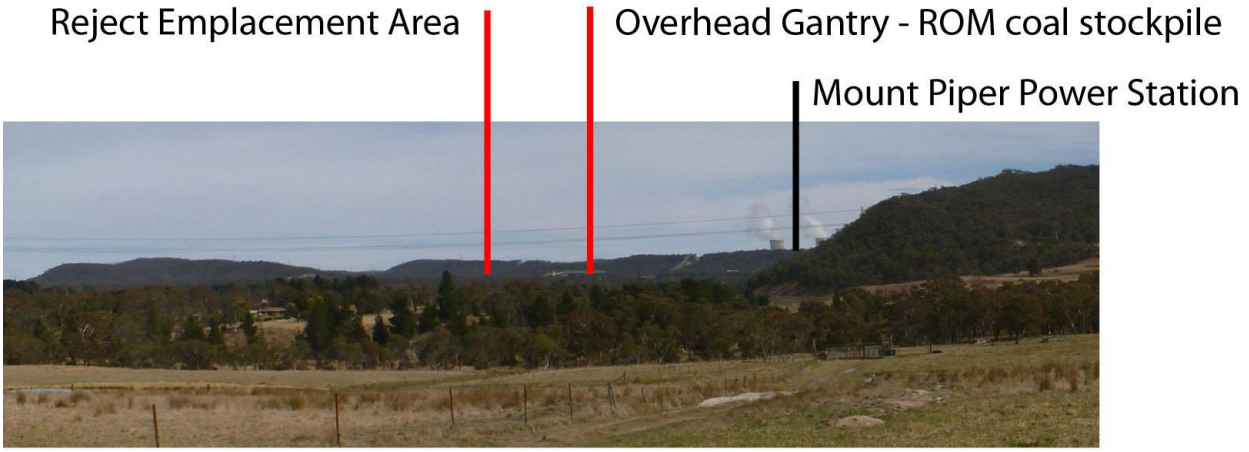


Plate 1 Photo Point 12: View west towards the site from Wolgan Road

The overhead gantry exists beyond the proposed and existing Washery, but at a higher level. The proposed rejects bin will be located in the vicinity of the over head gantry, being shorter than the gantry it is unlikely to be viewed by any private receptors. The new Washery will be the same height as the existing Washery – both of which are well shielded from surrounding vantage points by topography and vegetation. These additional elements will form part of the existing view from a distance and are not considered a major visual impact.

Link Haul Road and Bridge Options.

The VIA considered the potential impact of both Link Haul Road Options.

Link Haul Road Option 1 follows the existing access road into the Springvale Coal Services Site and will have the most visual impact on the locality of Blackmans Flat. The montage contained in **Figure 37** depicts a panorama with the location of proposed elements that can be viewed from the locality. It also incorporates a montage with an image of the proposed bridged over the Castlereagh Highway. From **Figure 37** it can be seen that the bridge will impede views through to the road side vegetation and trees on the curve of the Castlereagh Highway. Although a bridge is considered compatible with the existing highway environs, if this option was built, careful consideration would need to be given to the landscape treatment of earthworks required for the ramp to the bridge crossing.

Link Haul Road Option 2 and its necessary bridge over the Castlereagh Highway will be approximately 500m further north from Blackmans Flat. Due to the existing ground level being two metres higher at this location than the location for Link Haul Road Option 1 bridge, it is likely option 2 bridge will be at least two metres higher. However, due to the vegetation and topography existing on either side of the highway at this location, it is considered that the approaches to the bridge will be largely shielded from view.

The montages contained in **Figure 37** and **Figure 38** depict the visual impact of both Link Haul Road Options.

The VIA suggests that Link Haul Road Option 2 is the most suitable in terms of minimising visual impact, as it will be located a greater distance from Blackmans Flat and the existing topography and trees will assist in shielding views through to the haul route bridge approaches. Visually it will be similar to an existing haul road bridge approximately 2.5 km north of the Springvale Coal Services Site.

9.5.8.4 Consequences of Potential Visual Impact

Elements of the Project will have a minor to moderate visual impact. As illustrated in **Figure 37** to **Figure 41**, the landscape assists with the visual absorption of the proposed elements. Ridgelines and forested areas in the locality break up the industrial elements and result in a reduction of the cumulative impact of multiple elements in the area. The highest visual sensitivity occurs adjacent to Blackmans Flat, where it has been determined that a Link Haul Road and Bridge will present additional visual intrusion to the area. However the existing Pine Dale mine site, including the existing and likely expanded overburden emplacement bund, and the Mt Piper Power Station site are considered more visually prominent and contributing more to visual intrusion than the proposed activities within the Springvale Coal Services Site. The majority of elements proposed by Springvale Coal will not cause added cumulative visual impacts to the catchment due to the location of the proposed elements and the factors such as topography and vegetation interrupting views to and across the site. Consequently, Link Haul Road Option 2, to be located a further 500 metres to the north, is the preferred option for reducing visual impact of a bridge over the Castlereagh Highway.

9.5.8.5 Management and Mitigation Measures

The following management and mitigation measures will be implanted in order to minimise the visual impact of the Project:

- Non reflective and neutral toned materials will be utilised wherever possible to reduce visual impacts where views to the site and infrastructure are available;
- Existing best practice will ensure lighting is managed to prevent light spill and intrusion into the receiving environment;
- Neutral tones will be used for the bridge and ramping component of the Link Haul Road;
- Battered slopes to the Link Haul Road bridge will be planted with a low-maintenance hardy ground cover flowering species that may provide some visual interest;
- Minimise removal of existing vegetation surrounding the Washery wherever possible; and
- Vegetation, trees and any natural topography that exists adjacent to the Link Haul Road bridge crossing should be maintained to assist with obstructing views to the haul route and bridge approaches.

9.5.8.6 Conclusion

Although the character of the area is influenced by mining activities, the landscape assists with the visual absorption of the elements, as ridgelines and forested areas in the locality break up the industrial elements and results in a reduction of the cumulative impact of the multiple elements in the area. A number of proposed upgrade elements will not produce major visual impact due to the visual screening provided by the road-side bank that fronts the site and the existing vegetation in the locality.

The VIA concludes that the visual impacts associated with the Project will be minor with implementation of adequate mitigation measures, including landscaping, material selection and prompt rehabilitation. The Project involves the establishment and use of a Link Haul Road and bridge that will be located approximately 500 metres from Blackmans Flat (option 2). This Link Haul Road is preferred to its alternatives due to its

comparatively fewer visual impacts noting that it will be visually similar to an existing haul road bridge approximately 2.5 km north of the Springvale Coal Services Site.

9.5.9 Cultural Heritage

9.5.9.1 Introduction

The BBRA considered the cultural heritage issues resulting from the Project were a *low risk,* as the development footprint for the Springvale Coal Services Site is already highly disturbed. However, in the interest of due diligence, a specialist study was undertaken.

RPS prepared a CHA for the Project. A copy of the Assessment is contained in **Appendix 11.** The objective of the CHA was to identify all archaeological (Aboriginal and non-Aboriginal) sites (potential and actual) within lease/licence areas to formulate mitigation and management strategies necessary for inclusion in the EIS. The CHA generally involved the following:

- A search of the relevant State and Federal heritage registers and listings, including the DECCW (now OEH) and the register for native title claimants;
- Identification of Aboriginal Land Councils, Elders and other interested parties through consultation with OEH;
- Liaison and partnership with the Aboriginal community;
- A review of all relevant documentation and statutory requirements with regard to both Aboriginal and non-Aboriginal heritage;
- Review of data from the OEH Aboriginal Heritage Information Management System (AHIMS) to identify known Aboriginal sites in the PAA;
- A review of environmental information and previous archaeological work to develop a predictive model for Aboriginal archaeological site patterning within the Springvale Coal Services Site;
- A review of previous non-Aboriginal archaeological work and relevant heritage databases for sites within the PAA;
- An assessment of archaeological sensitivity within the Springvale Coal Services Site;
- Evaluation of potential impacts; and
- Preparation of mitigation and management strategies.

A summary of the CHA is provided below.

9.5.9.2 Consultation

The purpose of Aboriginal community consultation is to provide an opportunity for the relevant Aboriginal stakeholders to have an input into the heritage management process.

In the case of this Project, the ACHCRs for Proponents (OEH 2010) has been followed. The ACHCRs 2010 include a four stage Aboriginal consultation process and stipulate specific timeframes for each stage. Stage 1 requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment. Stage 1 includes the identification of Aboriginal people who may have an interest in the Springvale Coal Services Site and may hold information relevant to determining the cultural significance of Aboriginal objects or places. This identification process draws on reasonable sources of information including: the relevant OEH regional office, the relevant Local Aboriginal Land Council(s), the registrar, Aboriginal Land Rights Act 1983, the Native Title Tribunal, Native Title Services Corporation Limited, the relevant local council(s), and the relevant catchment management authority. The identification process also includes an advertisement placed in a local newspaper circulating in the general location of the

PAA. Aboriginal organisations and/or individuals identified should be notified of the Project and invited to register an expression of interest (EoI) for Aboriginal consultation. Once a list of Aboriginal stakeholders has been compiled from the EoIs, they need to be consulted in accordance with ACH Consultation Requirements Stages 2, 3 and 4.

An outline of the consultation process conducted for the Project is contained in Section 6.3.3 of the EIS.

After the meetings outlined in Section 6.3.3 of the EIS and subsequent field survey, a draft of the CHA report was prepared and provided to the both the Aboriginal community groups that participated in the field survey and the other Aboriginal organisations that had requested a copy of the report. Feedback or comments from each representative group were sought, but none were provided. A total of 28 days was given to the representative groups to provide comments as stated in Section 4.4, subsection 4.4.3 of the OEH ACHCR 2010 Manual. Reminders were also issued out to the Aboriginal Stakeholder groups one day prior to the closing date for receiving comments and feedback. No feedback or comments were provided by any of the groups that had registered an interest in the Project.

9.5.9.3 Existing Environment

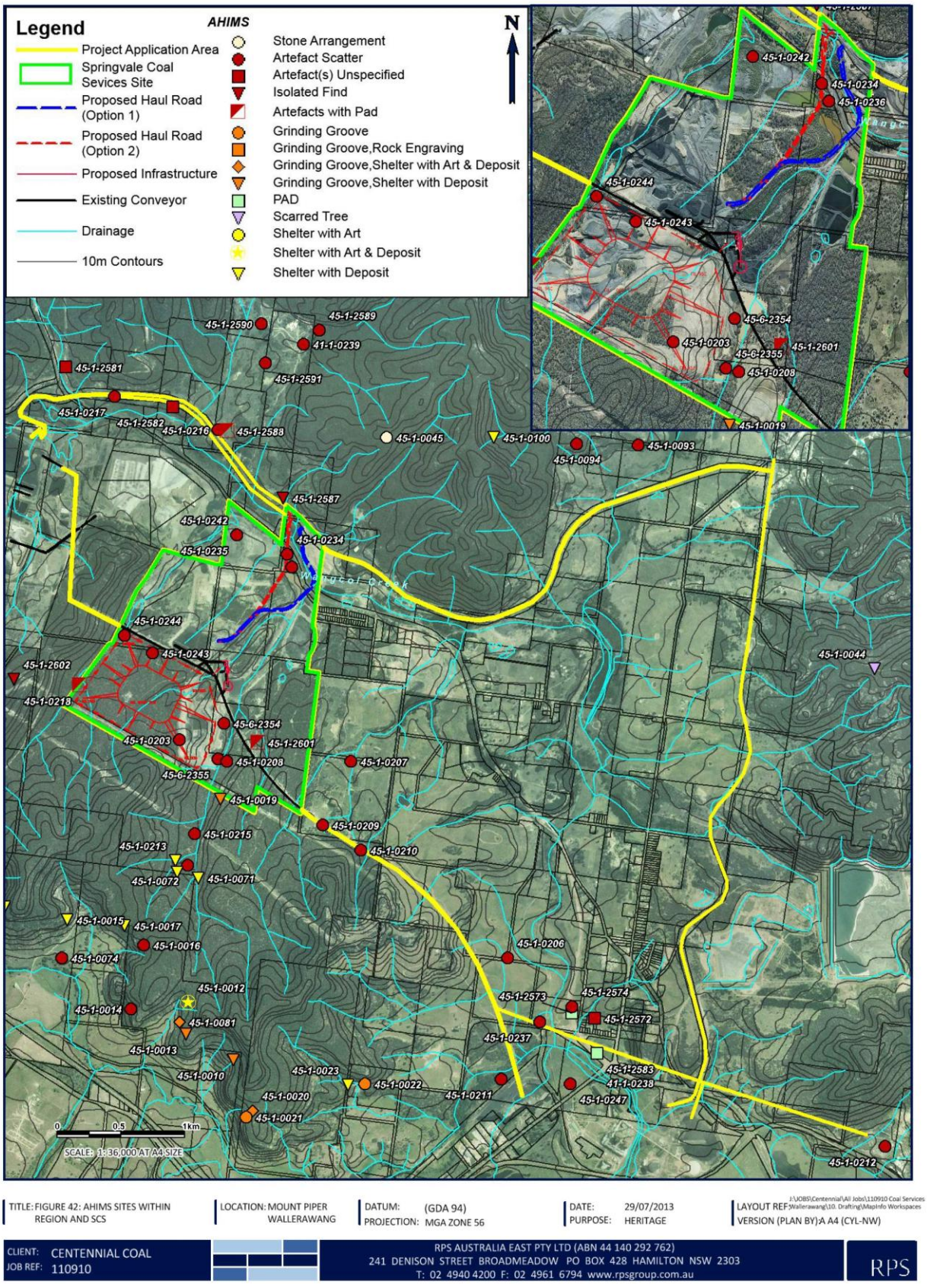
Aboriginal Heritage

The Aboriginal heritage assessment process requires that the significance of Aboriginal sites within a study area be assessed. It is important that Aboriginal sites are contextualised within the local and regional landscape in order to inform the assessment of significance. The Aboriginal heritage context is also needed in order to develop a predictive model of Aboriginal sites in the Project Area. Historical information also provides additional information for the interpretation of archaeological sites.

Aboriginal Heritage Information Management System (AHIMS) – PAA

A search of the OEH AHIMS for a 10 km area radiating from the Springvale Coal Services Site was conducted on the 9th December 2011, this yielded 97 results. Due to the large quantity of sites identified within a 10 km radius of the Springvale Coal Services Site, the analysis was narrowed to only capture sites in proximity to the PAA. The parameter of the AHIMS search was subsequently limited to GDA Zone 56H (230704 m E – 6306164 m N) and a total of 60 sites were identified within the PAA. The most common site types were open camp-sites, rockshelters with deposit, and isolated finds. All other site types occurred in fewer numbers. An inspection of the site cards revealed that AHIMS #45–1–0236 was a duplication of AHIMS #45–1–0241. AHIMS #45–1–0242 was also identified as a duplication of AHMS #45–1–0235. Given that two sites were mistakenly registered twice, the correct number of sites in proximity to the PAA was 58. A plan of the search area is found in **Figure 42**, and identifies the AHIMS sites within the region and within the Springvale Coal Services Site.

Figure 42 AHIMS Sites



AHIMS Sites Previously Recorded in the Springvale Coal Services Site

Although 58 sites had been previously identified within the PAA, only 11 of these reside inside the Springvale Coal Services Site. It is important to note that actual development will only take place within the Springvale Coal Services Site, as such, none of the AHIMS sites captured outside of the Springvale Coal Services Site will be harmed by development works.

The 11 previously identified sites inside the Springvale Coal Services Site were artefact scatters recorded between 1992 and 1993. Given that most of these sites reside in the area of active mine works, a search of the OEH AHIMS database revealed that seven (7) of these sites have been destroyed after seeking a S90 AHIP. **Table 52** provides a listing of the previously recorded sites inside the Springvale Coal Services Site. The remaining three sites are: AHIMS #45–1–0208, AHIMS #45–1–2601 and AHIMS #45–1–0218. They are still present onsite and are discussed below.

AHIMS #45–1–0208 (Site 5)

AHIMS #45–1–0208 was identified and originally recorded in 1991 by Elizabeth Rich. The site consisted of one bipolar flake and a distal flake fragment, both manufactured from quartz. These artefacts were identified along the base of a steep slope above Lamberts Creek surrounded by woodland vegetation. OzArk (2005) attempted to relocate the site, as the AHIMS site card indicated that the site was never salvaged because the proposed works at the time would not disturb the site. OzArk (2005) did not find the two quartz flakes, although there were quartz pieces where the site was presumed to be located. Advice was given to the client to apply for a S90 AHIP to salvage, but the AHIP was never sought because the site was not at risk of harm.

AHIMS #45–1–2601 (SVW-OS1)

AHIMS #45–1–2601 was identified and originally recorded by Oz Ark in 2005. This was an Open Site assessed with Potential Archaeological Deposit (PAD), situated on a slightly flat landform near a small drainage line. AHIMS #45–1–2601 was deemed highly disturbed by a vehicle track and mining activity adjacent to the site. As a result, the artefacts were removed from the track and placed at the base of a red stringybark tree to prevent further damage to the stone artefacts. The site was assessed as having moderate scientific significance and high Aboriginal significance, this was confirmed by the traditional stakeholder representing BLALC in the field. It was recommended that an S90 AHIP to salvage be undertaken after limited test pitting had been conducted if the site was likely to be impacted by proposed mine works. The client, however, was able to avoid the site which was subsequently protected with barrier flagging.

AHIMS #45–1–0218 (Site 7)

AHIMS #45–1–0218 was identified and originally recorded in 1992 by Elizabeth Rich and Alice Gorman, and revisited in 2005 by OzArk. AHIMS #45–1–0218 was an open site consisting of ten artefacts on an overgrown track set on a low spur above a gully. Ten artefacts were recorded, all manufactured from quartz except for one which was of a fine-grained white material. The assemblage consisted of eight flakes and two cores and there was limited potential for intact sub-surface deposits. The proposed development works at the time the site was identified only posed minimal risk of harm to the site in terms of disturbance. As a result no permits were sought to destroy the site. OzArk (2005) revisited the site, relocated a few of the artefacts and came to the conclusion that a S90 AHIP to impact the site should be sought after undertaking limited test pitting. However, Springvale Coal opted to protect the site which was flagged with tape and noted on mining plans to avoid. AHIMS #45–1–0218 is still present onsite.

Table 52 Summary of Previously Recorded Sites inside the Springvale Coal Services Site

Site Name	AHIMS Number	Year Registered	Site Type	Recommendation at the time	Current Status
Western Main 2	45–1–0234	1993	Open Camp Site	Fencing for protection. Subsurface testing to be carried out.	Consent to destroy granted under S90 Permit (Artefacts have been salvaged).
Site 13	45–1–0244	1993	Open Camp Site	Consent to destroy part of the site to be issued without further archaeological work required.	Consent to destroy granted under S90 Permit (Artefacts have been salvaged).
Lamberts Creek 6	45–6–2355	1992	Open Camp Site	Subsurface testing undertaken. Only a small number of sparsely distributed artefacts.	Consent to destroy granted under S90 Permit (Artefacts have been salvaged).
Lamberts Creek 7	45–6–2354	1992	Open Camp Site	Subsurface testing undertaken.	Consent to destroy granted under S90 Permit (Artefacts have been salvaged).
Western Main 1	45–1–0236/45–1–0241	1993	Open Camp Site	Consent to destroy be sought.	Consent to destroy granted under S90 Permit (Artefacts have been salvaged).
Site 12	45–1–0243	1993	Open Camp Site	Consent to destroy be sought.	Consent to destroy granted under S90 Permit (Artefacts have been salvaged).
Site 6	45–1–0203	1992	Open Camp Site	Proposed development to be marked out on the ground. If most sites to be destroyed it warrants salvage.	Site destroyed.
Western Main 3	45–1–0242/0235	1993	Open Camp Site	Consent to destroy be sought	Site destroyed.
Site 5	45–1–0208	1992	Open Camp Site	Site would not be affected by proposed works (1992). OzArk in 2005 was unable to relocate the site. It was recommended that an S90 AHIP to destroy the site be sought and granted.	Unable to relocate the site. OzArk (2005). No S90 AHIP was sought to destroy.
SVW-0S1	45–1–2601	2005	Open Site with PAD	Avoid impact if possible or implement a limited test excavation prior to destruction if the site cannot be avoided.	Avoid impact if possible or implement a limited test excavation prior to destruction if the site cannot be avoided.
Site 7	45–1–0218	1992	Open Site with PAD	Extent of conveyor to be marked out on ground so that the full extent of impact can be determined. OzArk in 2005 recommended that limited test pitting at this site be undertaken prior to destruction.	The site has been flagged with tape and noted on mining plans to be avoided.

Predictive Model

A predictive model was created to provide an indication of Aboriginal sites likely to occur within the Springvale Coal Services Site. It draws on the review of the existing information from the regional and local archaeological context, as well as the environmental context. The predictive model is necessary to formulate appropriate field methodologies and to provide information for the assessment of archaeological significance.

There are a number of factors which influence Aboriginal occupation of an area. These include essential subsistence resources such as food (flora and fauna), as well as freshwater. However, other resources such as stone raw materials, wood and bark, animal skins, reeds for uses such as basket weaving, string, clothing and similar, were also used.

Landscape features such as dune ridges, creek lines, swamp areas, ridges, flat elevated areas, rockshelters and similar, may have also influenced Aboriginal occupation of an area. In addition, cultural activities may have taken place at certain locations in the landscape – for example corroborees, mythological places and initiation sites.

Survey Results

This Springvale Coal Services Site was surveyed in six survey units as depicted in **Figure 43**. A pedestrian survey was completed over two days (13 January and 8 February, 2012) by RPS archaeologist Cheng Yen Loo, accompanied by Aboriginal community stakeholders representing the North-East Wiradjuri (Mr Jack Pennell), Mingaan Aboriginal Corporation (Mr Elwin Wolfenden), Bathurst Local Aboriginal Land Council (Ms Chantel Peters-Chapman) and Warrabinga Native Title Claimants Aboriginal Corporation (Ms Wendy Lewis). On the 8th of February, a further survey was conducted by RPS archaeologist Mr David White.

A discussion on each survey unit is provided below.

Coal Services Survey Unit 1(CS SU1)

CS SU1 consisted of a small portion of land north of the Castlereagh Highway which was owned and operated by Pinedale Coal Mine (ML 1569). This Survey Unit was approximately 8.5 ha and access was gained from the Castlereagh Highway. Upon inspection of the Survey Unit, it was noted that the area was highly disturbed by earthworks as portions of the Survey Unit extended into an active mining area, which is surrounded by a pine plantation. Estimated ground surface visibility ranged between 30 – 85% and all areas had been disturbed by development activities. Access to a number areas of the Survey Unit was impeded by artificial ponds and tributaries that spur off Wangcol Creek.

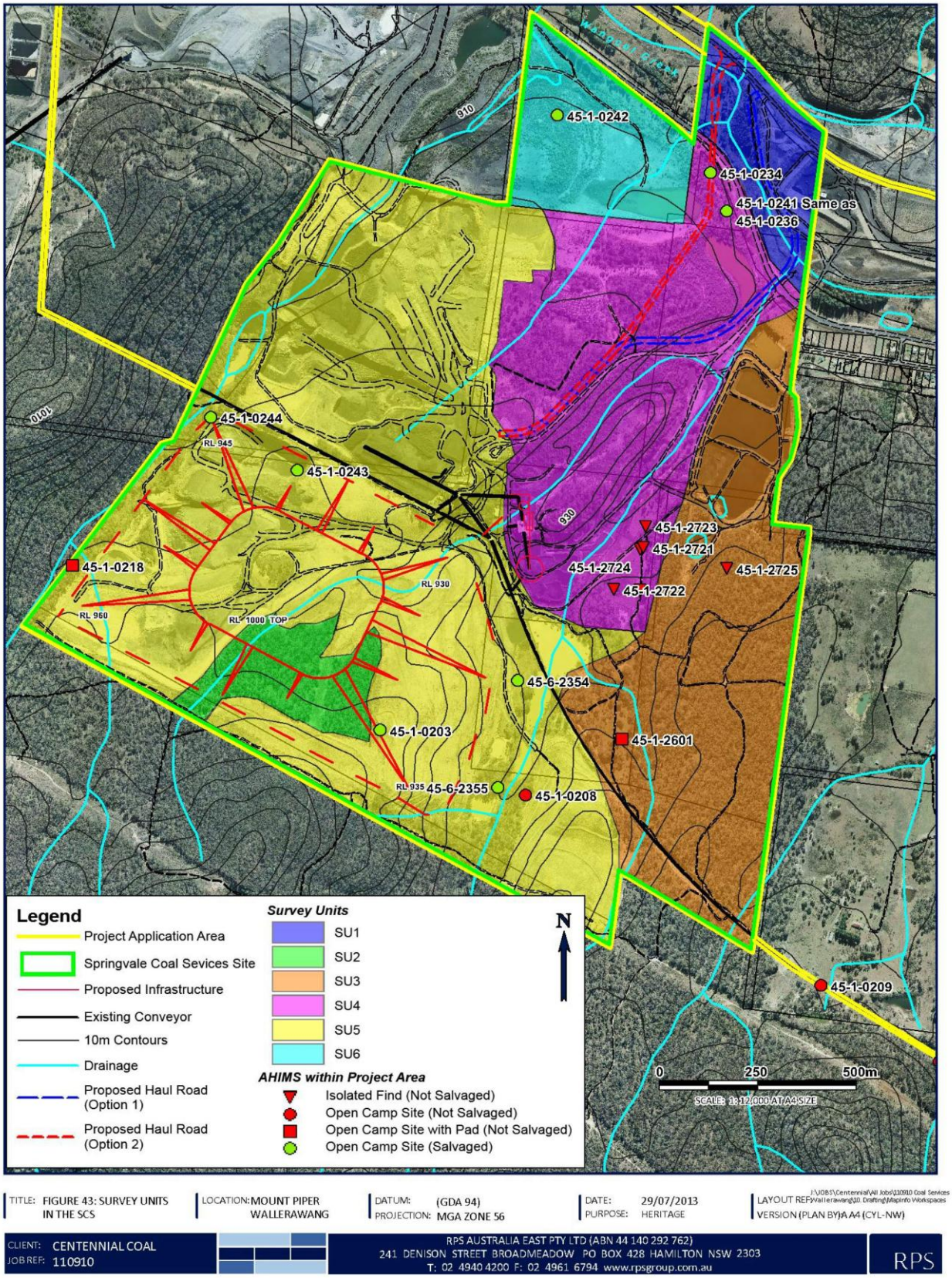
No Aboriginal cultural material or items of historical significance were identified in CS SU1.

Coal Services Survey Unit 2 (CS SU2)

CS SU2 was south of the Castlereagh Highway close to the southern boundary of the Springvale Coal Services Site. This portion of land consisted of two discrete clumps of woodland vegetation, totalling approximately 9.4 ha, and resides in CCL 733. The woodland vegetation has been moderately impacted by logging. The periphery of this Survey Unit has been disturbed and modified by a regrowth plantation. Some littering in the area was noted, with cans and plastic objects scattered throughout, although the amount was minimal. Ground surface visibility ranged from 65% in vegetated areas, to 90% in exposed clearings.

No Aboriginal cultural material or items of historical significance were identified in CS SU2.

Figure 43 Survey Units in the Springvale Coal Services Site



Coal Services Survey Unit 3 (CS SU3)

CS SU3 is approximately 53.1 ha and lay along the eastern boundary of the Springvale Coal Services Site. It includes a raised platform south of the coal conveyor dominated by open woodland forest with an understorey of small bushes and ground cover of seasonal grass. Several small clearings were noted in the survey unit, some of which appeared to be the product of natural erosion. The landscape gently undulated and some minor surface cracking was noted. According to Tony Seibel–Barnes (Springvale Coal), the cracks were caused by ground subsidence induced by coal extraction. The survey unit was littered with piles of rubbish, most likely the result of illegal dumping of household rubbish in the past. Several dirt tracks also meandered throughout the landscape and these were used to access the full extent of the survey unit. Estimated ground surface visibility ranged from 5% in dense vegetation, to approximately 80% in the clearings. One newly identified artefact was located in a clearing. Further discussion regarding the isolated find is found later in this Section.

An open site with PAD (AHIMS #45–1–2601) in this survey unit was recorded in 2005 (OzArk), the site comprised six artefacts located on an unsealed track. The site was assessed as having high Aboriginal significance and moderate scientific significance. The site remains onsite and has been flagged in the field with wooden marker posts. Springvale Coal's proposed development plans are not in proximity to the site and present no risk of harm.

One new Aboriginal site (AHIMS 45–1–2725) was identified and recorded in CS SU3 and no items of historical significance were identified.

Coal Services Survey Unit 4 (CS SU4)

CS SU4 was approximately 56.8 ha and consisted of a portion of land containing some woodland vegetation. This survey unit lay to the south of the Castlereagh Highway and west of the existing access road. Several small clearings were noted throughout the survey unit, and these, alongside areas of unsealed track, were inspected for cultural material. Ground surface visibility varied throughout, ranging from 60% to 85%. The area near the Wangcol Creek tributary was inspected for cultural material, but no artefacts were identified. Evidence of disturbance was marked by soil dumps and garbage in the survey unit. Two artefact scatters (AHIMS #45–1–0234 and AHIMS #45–1–0236/0241) located in close proximity to the Castlereagh Highway were recorded in this survey unit in 1993, but these have since been salvaged under a Section 90 AHIP. During the survey, the signage and old fence boundary of AHIMS# 45–1–0234 was observed. A total of five isolated finds were identified in the eroded clearings adjacent to a dirt track. Four of these artefacts were manufactured from quartz, the other of quartzite. All of these artefacts were complete flakes, except for one distal flake fragment. The artefacts are not likely *in situ,* as the area appears to have been re-vegetated.

Five new Aboriginal sites (AHIMS 25–1–2720/2721/2722/2723/2724) were identified and recorded in CS SU4 and no items of historical significance were identified.

Coal Services Survey Unit 5 (CS SU5)

CS SU5, measuring 139.9 ha, consisted of the Springvale Coal Services stockpile area, the proposed REA near the southern project boundary, and cleared land for the current operations. CS SU5 was the largest survey unit in the Springvale Coal Services Site and had been heavily modified. Ground surface visibility was high, but no new Aboriginal sites were located. A total of seven Aboriginal sites have previously been recorded and registered with OEH, all of which were artefact scatters recorded in 1992 and 1993. It is believed that a consent to destroy permit (S90 AHIP) was sought and granted for five of these sites, with the other two being AHIMS #45–1–0218 and AHIMS #45–1–0208.

AHIMS #45–1–0218 was originally recorded by Rich and Gorman in 1992. This site was protected with flagging tape and noted on Springvale Coal's mining plans as an area to be avoided, in accordance with recommendations from OzArk in 2005 (after a revisit to the site). A total of 10 artefacts were identified along an overgrown and disused vehicle track. Geographically, the site was near the western side of the Project boundary and 12m away from the proposed REA 1. Based on the advice of the client, the proposed works would not impact on the site, as a bunt divided the site from the area of activity.

AHIMS #45–1–0208 was originally identified in 1991 by Rich and Gorman. The site was an open scatter consisting of two artefacts amongst quartz gravels on a dirt track. In 2005, OzArk revisited the site, but was unable to relocate the artefacts. Recommendations were made to destroy the site via a S90 AHIP, as the artefacts were assessed as having low cultural significance and the proposed works for the 2005 project would have impacted the site. In 2011, RPS retrieved AHIMS #45–1–0208 site cards to confirm that a S90 AHIP had been granted to destroy the site, but, there was no information to indicate that a S90 AHIP had been sought and granted. RPS attempted to relocate the site but was unable to find the artefacts. Given that it has been 21 years since the site was first recorded, the natural processes of erosion have most likely displaced the artefacts.

No additional Aboriginal cultural material or any items of historical significance were identified in CS SU5.

Coal Services Survey Unit 6 (CS SU 6)

CS SU6 is in the north-western portion of the Springvale Coal Services Site. CS SU 6 is bounded to the north by Castlereagh Highway and the ground surface area is relatively flat. A portion of the survey unit has been rehabilitated with native vegetation. Relatively juvenile scrub trees and an understorey of seasonal grass dominated the revegetated landscape. Ground surface visibility in that area was relatively low. The remainder of the survey unit has been heavily disturbed by landfill material. In 2006, a development assessment report for Blackmans Flat Waste Management Facility was prepared for LCC. CS SU 6 formed part of the Blackmans Flat Landfill and this has seen a portion of the area subject to extensive disturbance.

One site previously recorded in CS SU 6 was AHIMS #45–1–0242/45–1–0235. This was an open camp site recorded in 1993 by Helen Brayshaw. The artefacts were identified in a strip of land that had been exposed by a bulldozer blade. The site itself was very low density comprising artefacts at >20m apart and partially disturbed. Brayshaw (1993) recommended that consent be sought to destroy the site under a S90 AHIP. However, it is uncertain if an AHIP application was actually sought to destroy the site.

During the field survey, RPS attempted to relocate AHIMS #45–1–0242/45–1–0235. The geographical location of the site is now in a highly disturbed area (infill facility and vehicle track way). AHIMS #45–1–0242/45–1–0235 no longer exists at its original position. No remnants of the site were observed during the field survey.

No additional Aboriginal cultural material or any items of historical significance were identified in CS SU6

Newly identified Sites within the Springvale Coal Services Site

A total of six sites were identified in the Springvale Coal Services Site: five in CS SU4 and one in CS SU3 as identified in **Figure 44** and **Table 53**. Several factors can influence the effectiveness of the field inspection, such as the level of ground surface visibility, exposure, and the number of people undertaking the inspection. The sites identified were mostly located in small patches of open clearing and additional areas of moderate to high visibility. Each site identified and recorded is discussed below.

Figure 44 Newly Recorded Sites

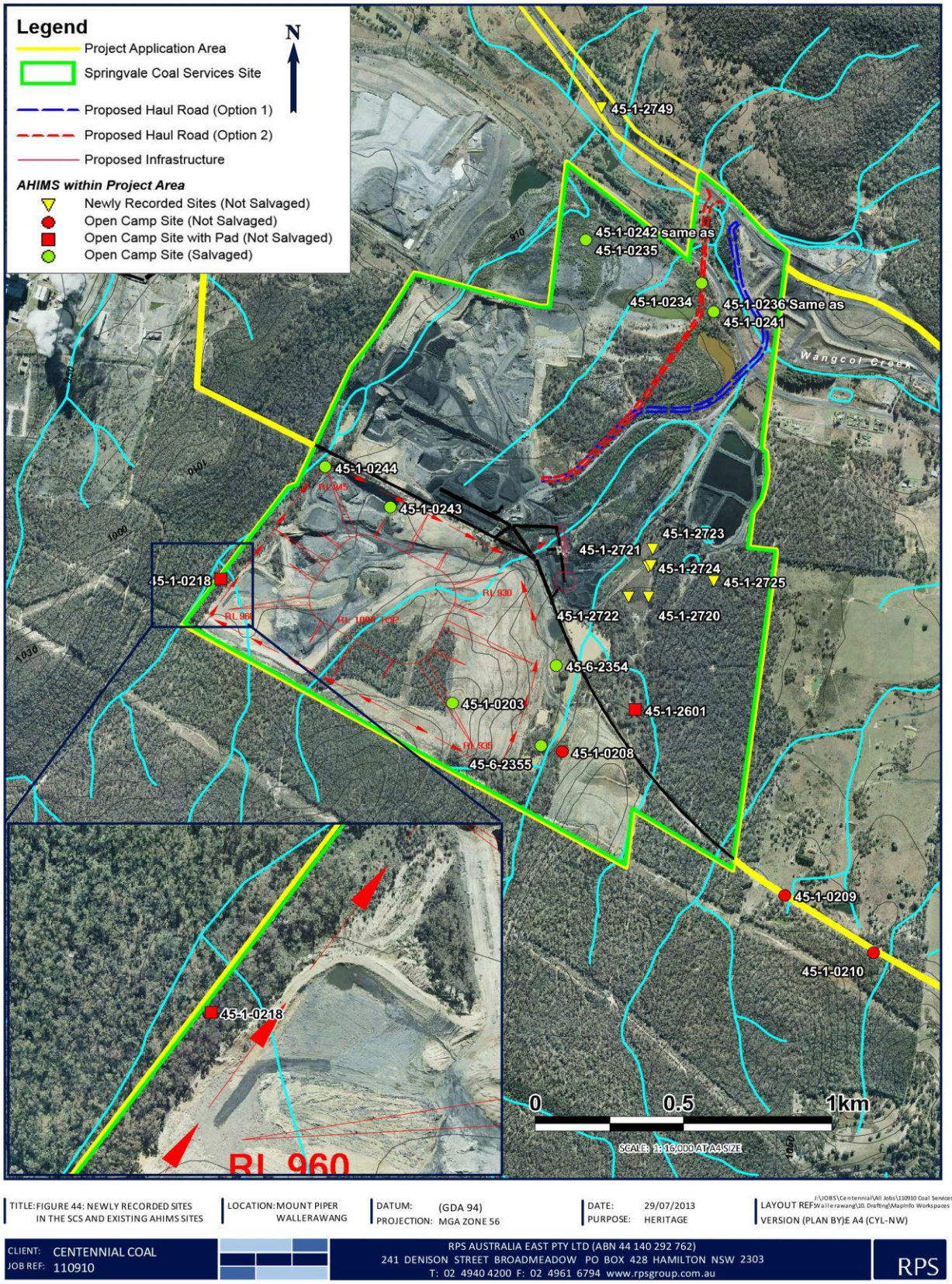


Table 53 Newly Recorded Aboriginal sites located within the Springvale Coal Services Site

No.	Code	Name	AHIMS Ref No	Eastings	Northings	Type
1	CS SU3 – A1	Coal Services Survey Unit 3 – Artefact 1	45–1–2725	E226166	N6303832	Isolated Find
2	CS SU4 – A1	Coal Services Survey Unit 4 – Artefact 1	45–1–2724	E225946	N6303882	Isolated Find
3	CS SU4 – A2	Coal Services Survey Unit 4 – Artefact 2	45–1–2723	E225959	N6303943	Isolated Find
4	CS SU4 – A3	Coal Services Survey Unit 4 – Artefact 3	45–1–2722	E225879	N6303777	Isolated Find
5	CS SU4 – A4	Coal Services Survey Unit 4 – Artefact 4	45–1–2721	E225953	N6303887	Isolated Find
6	CS SU4 – A5	Coal Services Survey Unit 4 – Artefact 5	45–1–2720	E225945	N6303776	Isolated Find

Item 1: CS SU3–A1

Isolated find CS SU3–A1 (AHIMS #45–1–2725) was identified in a small clearing surrounded by a sparse cover of seasonal grass. This artefact was a distal fragment of quartz located at co-ordinates (56H 226166–6303832), approximately 139 m from the artificial sedimentation pond. The quartz fragment was relatively small, measuring 15 mm x 9 mm x 4 mm, exhibiting one negative flake scar on the dorsal surface and 20% remaining cortex. This site is greater than 50 m away from the proposed REA boundary and Link Haul Road and is therefore not at risk of harm from proposed development.

Item 2: CS SU4–A1

Isolated find CS SU4–A1 (AHIMS # 45–1–2724) was identified on a clearing subject to seasonal inundation and approximately 7 m west from a light vehicle track. The area was relatively clear of woodland trees, only surrounded by small low lying shrubs and grass. The isolated find consisted of a quartz compete flake measuring 14 mm x 16 mm x 5 mm, and a flat platform (6 mm x 4 mm). One negative flake scar and 60% terrestrial cortex were recorded. This site is greater than 50 m away from the proposed REA boundary and Link Haul Road and is therefore not at risk of harm from proposed development.

Item 3: CS SU4–A2

Isolated find CS SU4–A2 (AHIMS #45–1–2723) was identified in a gravel clearing on a lower hill that gently sloped towards the south-east. A graded track was adjacent to the clearing and the ground surface appeared to have been disturbed in the recent past. The artefact was a complete flake of quartz measuring 14 mm x 11 mm x 5 mm and a cortical platform (10 mm x 5 mm). The flake exhibited one negative flake scar and 50% terrestrial cortex. This site is greater than 50 m away from the proposed REA boundary and Link Haul Road and is therefore not at risk of harm from proposed development.

Item 4: CS SU4 – A3

Isolated find CS SU4–A3 (AHIMS #45–1–2722) was identified amongst a dense ground cover of grass surrounded by small shrubs. A light vehicle track was located approximately 20 m west. The artefact was a complete flake of quartz measuring 31 mm x 11 mm x 5 mm and a cortical platform (15 mm x 5 mm). Two negative flake scars were noted on the dorsal surface. This site is greater than 50 m away from the proposed REA boundary and Link Haul Road and is therefore not at risk of harm from proposed development.

Item 5: CS SU4 – A4

Isolated find CS SU1–A4 (AHIMS # 45–1–2721) was identified in a sandy clearing on a gentle slope. Vegetation in proximity of the site consisted of low-lying scrub with a dense ground cover of seasonal grass. The isolated find was a distal flake fragment of quartz measuring 16 mm x 7 mm x 3 mm. Two dorsal scars were identified, but no evidence of use, wear or retouch was identified on the lateral margins. This site is greater than 50 m away from the proposed REA boundary and Link Haul Road and is therefore not at risk of harm from proposed development.

Item 6: CS SU4 – A5

Isolated find CS SU4–A5 (AHIMS # 45–1–2720) was identified on a small gravel clearing adjacent to a light vehicle track orientated on an approximate north-south axis. The isolated find was a complete flake of pale purple silcrete measuring 36 mm x 31 mm x 9 mm and a flat platform (22 mm x 7 mm). Two negative flake scars were identified on the dorsal surface of the flake. This site is greater than 50 m away from the proposed REA boundary and Link Haul Road and is therefore not at risk of harm from proposed development.

Non-Aboriginal Heritage

Lithgow Valley's first European settlers arrived in 1824 and construction of the railway line into the Lithgow Valley began in 1866. The exploitation of coal in the valley was closely related to the development of the railway and by 1874 there were four coal mines operating in the Lithgow Valley.

The accessibility of the Lithgow coal seam at various localities in the region dictated that mines and mining communities developed in close proximity to one another. The best example is at Lithgow, where colliery headworks were located within 100–200 metres of one another. Generally speaking, coal mines between the years 1831–1946 were worked using manual labour employing a large number of workers mostly engaged by contract or piecework arrangements. Miners normally would walk, ride a horse or push-bike to their work place and were expected to provide their own mining tools and equipment.

Searches of the following have been undertaken to determine the potential for known non-Aboriginal heritage items to be affected by the Project:

- World Heritage List;
- National Heritage Database;
- NSW State Heritage Place Inventory;
- LC LEP 1994;
- Draft LC LEP 2013; and
- Lithgow Heritage Study 2000.

World Heritage List

A search of the World Heritage List was undertaken on the 27 January 2012 to ascertain whether any world heritage items reside in or in close proximity to the Springvale Coal Services Site. It was determined that the Springvale Coal Services Site does not contain any world heritage listed items.

National Heritage Database

A search for Australian heritage sites was conducted on the in the 17th January 2012. This database contains information of more than 20,000 natural, historical and Aboriginal places. This database includes

information from the World Heritage List, National Heritage List, Commonwealth Heritage List, and the Register of the National Estate amongst several other databases. A search within the Lithgow Local Government Area (LGA) was conducted to determine if any items in the surrounding area were registered with historical significance.

The National Heritage List is now the lead statutory document for the protection of heritage places considered to have national importance. This list comprises Indigenous, natural and historic places that are of outstanding national heritage significance to Australia. Listed places are protected under the EPBC Act. There are nine places that have been nominated for heritage listing under the National Heritage List as identified in **Table 54**. It was noted that none of these heritage sites are located near the Springvale Coal Services Site.

Table 54 National Heritage Database

Name of Item	Address	Suburb	Heritage Listing/Significance
Coke Ovens at Newnes Shale Oil Plant	Wolgan Rd	Newnes, NSW	Register of the National Estate
Coxs River Rail Bridge at Wallerawang (former)	Main Western Railway Line (Former)	Wallerawang, NSW	Register of the National Estate
Middle River Rail Bridge at Marrangaroo	Main Western Railway Line	Marrangaroo, NSW	Register of the National Estate
Mudgee Overpass Road Cutting	Mudgee Rd	Marrangaroo, NSW	Register of the National Estate
Newnes Junction - Sodwalls Original Railway	Main Western Railway Line	Lithgow, NSW	Register of the National Estate
Newnes Shale Mine Site	Wolgan Rd	Newnes, NSW	Register of the National Estate
The Pagoda Country	Great Western Hwy	Lithgow, NSW	Register of the National Estate (Indicative)
Willowvale Farm	Portland Rd	Wallerawang, NSW	Register of the National Estate (Indicative)
Wolgan Valley	Wolgan Rd	Wolgan Valley, NSW	Register of the National Estate (Indicative)

NSW Heritage Place Inventory

The State Heritage Inventory contains heritage items on statutory lists in NSW. The information is provided by local councils and state government agencies. The Heritage Branch is directly responsible for the State Heritage Register which upkeeps and maintains a list of items and places that of particular importance to NSW. A search of the NSW State Heritage Inventory on 27th January 2012 in the area of Wallerawang yielded the places listed in **Table 55.**

Table 55 NSW State Heritage Inventory

Name of Item	Address	Suburb	Heritage Listing/Significance
St. John the Evangelist Church	Main Street	Wallerawang	NSW Heritage Act
Wallerawang rail bridges over Cox's River	Main Western Railway	Wallerawang	NSW Heritage Act
Wallerawang Railway Station and yard group	Main Western Railway	Wallerawang	NSW Heritage Act

The NSW Heritage Inventory lists items at the NSW (State) level and at the local level. Items of State significance are registered by the NSW Heritage Council under the NSW Heritage Act. Those items are listed on the State Heritage Register as being under an Interim Heritage Order or protected under section 136 of the NSW Heritage Act.

The Inventory also includes some heritage places of heritage significance within a local government area. These places are listed by local council under their local environment plans and additionally may be included on the NSW Heritage Inventory database. There are three places that have been nominated for heritage listing under the NSW Heritage Inventory under state significance. None of the heritage sites listed in **Table 55** is in proximity of the Springvale Coal Services Site.

LC LEP 1994

Items of significance at the local government level are included in the local environmental plans as Heritage Schedules. These are a list of European and some Aboriginal items which have been listed with a council as having heritage value. A search of the LC LEP 1994 has indicated that there are no items listed in the village of Blackmans Flat. Surrounding Blackmans Flat is a total of 15 items of historical significance to the Lithgow LGA as listed in **Table 56**. None of the historical sites identified in the surrounding vicinity of Blackman's Flat reside in the Springvale Coal Services Site.

Table 56 Items of Historical Significance near Blackman's Flat (LC LEP 1994)

Name of Item	Address	Suburb	Heritage Listing/Significance
Barton Park Cemetery		Wallerawang	State Government
Hospital Cottage	Lithgow Rd	Wallerawang	State Government
Hospital Farm Barn	Lithgow Rd	Wallerawang	State Government
Mary Slaven's Grave		Wallerawang	State Government
Railway Items Newnes Junction - Sodwalls	Main Street	Wallerawang	Local Government
School and Residence	Main Street	Wallerawang	Local Government
St John the Evangelist Church	Main Street	Wallerawang	Local Government
Walker-Barton private cemetery		Wallerawang	Local Government
Wallerawang A and B Power Stations chimney stack	Main Street	Wallerawang	State Government
Wallerawang Police Station and Official Residence	17 Tweedie Street	Wallerawang	State Government
Wallerawang Railway Precinct	Main Street	Wallerawang	State Government
Wallerawang Schoolhouse		Wallerawang	State Government
Wallerawang, Cox's River Underbridge	169.593km, Main Western Railway Line	Wallerawang	State Government
Willowvale	Portland Rd	Wallerawang	State Government
Wolgan Valley Station	Wolgan Rd	Wallerawang	State Government

Draft LC LEP 2013 and Lithgow Heritage Study 2000

A search of the Draft LC LEP 2013 has indicated that one item, namely "Berwindi" which is a stone farmhouse or hut, is within the vicinity of the Springvale Coal Services Site, as identified in **Figure 45**. Berwindi is located at 1470 Castlereagh Highway, Blackmans Flat and has a Significance Listing of Local

within the Draft LC LEP 2013. A search of the Lithgow Heritage Study 2000 indicates the Blackmans Flat Roman Catholic Cemetery is also an item of potential interest however it is not listed within the Draft LC LEP 2013. **Figure 45** illustrates the location of the Blackmans Flat Roman Catholic Cemetery. Both items are located outside of the boundary of the Springvale Coal Services Site however their presence should be noted for future reference.

The Springvale Coal Services Site was inspected for items of historical significance during the survey described above. There were no objects identified or present during the survey.

9.5.9.4 Heritage Impact Assessment

Aboriginal Heritage

Based on the review of all Aboriginal sites in the Springvale Coal Services Site and using the scientific criteria outlined in the OEH heritage guidelines, a total of nine known sites (three existing and six new sites) are located in the Springvale Coal Services Site. Of these sites, none are at high risk of impact – one is at low-moderate risk, and eight are at low (remote) risk of impact. The location of the sites is shown in **Figure 44.**

Low to Moderate Risk Site AHIMS #45–1–0218

AHIMS #45–1–0218 is approximately 40 m from the proposed REA development footprint and is at low-moderate risk of harm. An artificial bund separates the site from the area of proposed mining activity and offers sufficient protection to avoid harm. It is understood that there will be no development works west of the bund where the site is located. To ensure that all Springvale Coal staff working in the vicinity are aware of the site, and to ensure that access is prohibited, it is advised that the site is re-fenced using star pickets (or comparable material) with high visibility barrier tape affixed to each picket. The site should continually be noted on future mine plans.

Low Risk – Remaining eight sites

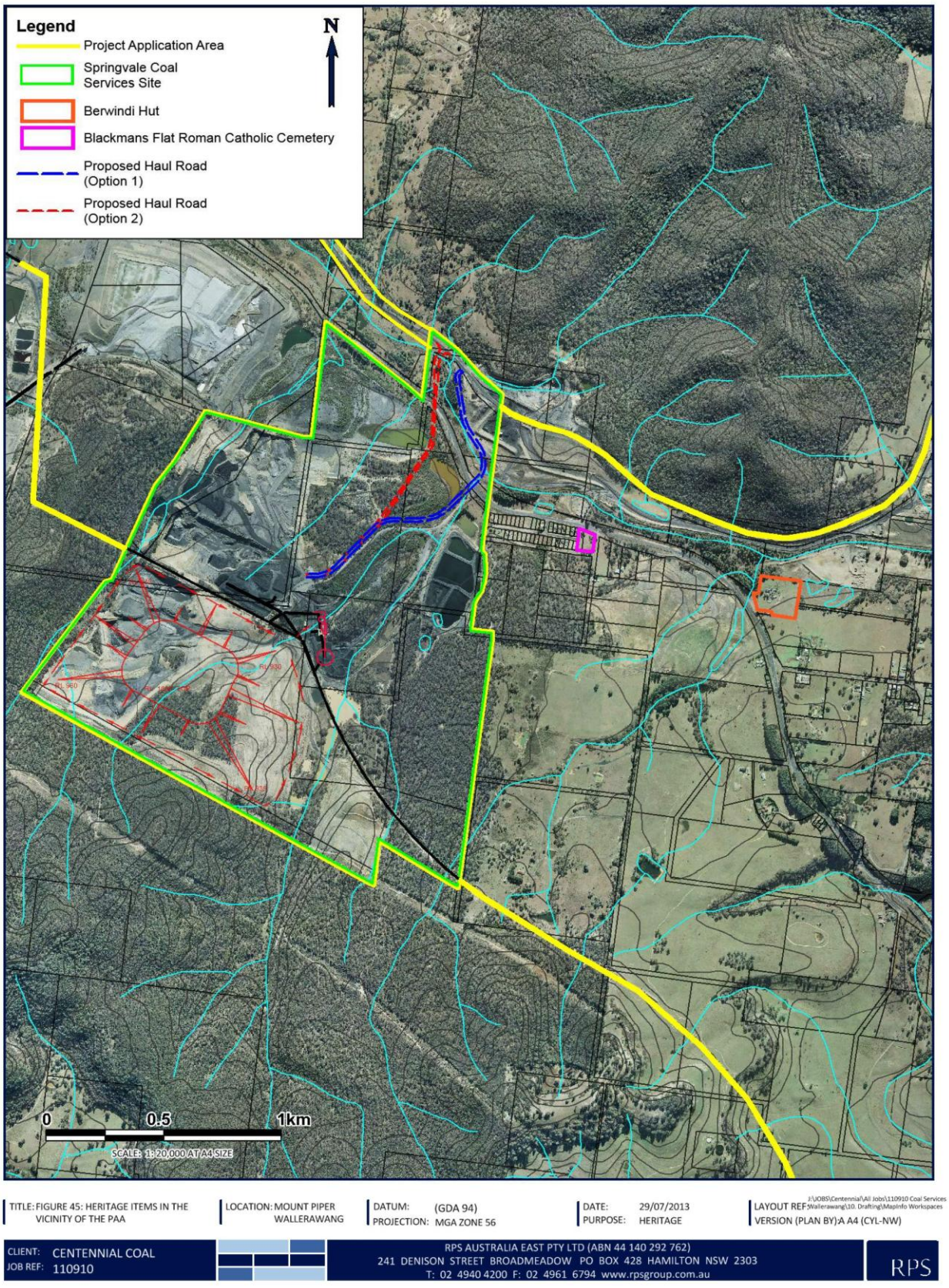
The eight remaining sites in the Springvale Coal Services Site being AHIMS # 45–1–0208, 45–1–2723, 45–1–2721, 45–1–2724, 45–1–2722, 45–1–2720, 45–1–2725 and 45–1–2601, are at low to remote risk of harm from mining works given that the development footprint is greater than 50 m from them. In the event that Springvale Coal is able to avoid the sites, it is recommended that a CHMP be produced by a suitably qualified cultural heritage consultant to ensure that appropriate steps are undertaken for the management of these Aboriginal sites.

Non-Aboriginal Heritage

Based on the outcome of the search results, nine places have been listed with National significance, three places under the NSW Heritage Place Inventory and 15 places under the LC LEP 1994 / Draft LC LEP 2013, although none are in close proximity to Springvale Coal Services Site. Two items, the “Berwindi” hut and the Blackmans Flat Roman Catholic Cemetery, demonstrate that a rich and abundant history surrounds the locality of Blackman’s Flat and stems from a long history stretching back to the time of early settlers in the western parts of the Blue Mountains region.

The PAA is well removed from any listed non-Aboriginal heritage items. Consequently, the Project would have no impact upon them.

Figure 45 Heritage Items in the vicinity of the Springvale Coal Services Site



9.5.9.5 Consequences of Potential Heritage Impacts

Aboriginal Heritage

Given that the newly identified sites were identified in a highly modified and/or disturbed landscape and comparing their location with respect to the development footprint of the Project components, the value of these sites along with the three existing ones has been assessed as low. There will be no consequences on Aboriginal Heritage from the Project.

Non-Aboriginal Heritage

There were no potential impacts identified within the PAA. As such, there would be consequences from the Project.

9.5.9.6 Management and Mitigation Measures

Aboriginal Heritage

The following management recommendations have been formulated with due consideration given to all available information.

Mitigation Measure 1

All Aboriginal and European heritage in the Springvale Coal Services Site should be managed under a CHMP, the Aboriginal aspects of which must be developed in consultation with the Aboriginal Stakeholders. This is to occur prior to any earthworks commencing. It is recommended that any potential harm to the newly recorded sites listed below is managed as part of the CHMP.

- AHIMS #45–1–2720;
- AHIMS #45–1–2721;
- AHIMS #45–1–2722;
- AHIMS #45–1–2723;
- AHIMS #45–1–2724; and
- AHIMS #45–1–2725.

Mitigation Measure 2

Springvale Coal Pty Ltd has modified the mine plan to avoid harm to AHIMS #45–1–02182018 and AHIMS #45–1–2601. Consequently, at both sites a protective buffer boundary should be established around them using star picket fencing with high visibility tape affixed to each picket. The buffer boundary should be monitored and maintained on a regular basis. The location of the protected sites should be noted on all future mining development plans.

Mitigation Measure 3

All relevant project staff should be made aware of their statutory obligations for heritage under NSW NPW Act (1974) and the NSW Heritage Act (1977), which may be implemented through a heritage induction.

Mitigation Measure 4

If further Aboriginal site(s) are identified in the Springvale Coal Services Site, all works in the area should cease and the area be cordoned off. Contact should be made with Enviroline (on 131 555), a suitably

qualified archaeologist and the registered Aboriginal stakeholders so that it can be adequately assessed and managed.

Mitigation Measure 5

In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area cordoned off. The NSW Police are to be contacted immediately. No further action is to be taken until the police provide written advice to the client on how to progress. If determined to be Aboriginal, the client must contact Enviroline (on 131 555), a suitably qualified archaeologist and representatives of the local Aboriginal community stakeholders to determine an action plan for the management of the skeletal remains, formulate management recommendations and to ascertain when work can recommence.

Non-Aboriginal Heritage

There were no non-Aboriginal Heritage constraints identified by the CHA. No mitigation measures are required.

9.5.9.7 Conclusion

The likelihood of any impact on Aboriginal Heritage has been assessed as *low* by the CHA. There are no cumulative impacts or foreseeable risk of harm arising from the proposed works on the Springvale Coal Services Site. Best practice mitigation measures have been suggested for the management of identified Aboriginal sites.

It was also concluded by the CHA report that there were no non-Aboriginal Heritage constraints. It is considered that the Springvale Coal Services Site is well removed from any listed Heritage Items and the proposed works will have no impact upon them.

9.5.10 Traffic and Transport

9.5.10.1 Introduction

The Project BBRA considered the potential impact of increased traffic movements to be a low risk. The Project will continue to use coal trucks on the existing private coal haul roads and avoid usage of coal trucks on public roads. In order to assess the potential risk identified by the Project BBRA, a specialist Traffic Impact Assessment (TIA) was undertaken. The TIA was conducted by Barnson Pty Ltd and was undertaken in accordance with the RTA Guide to *Traffic Generating Developments* (2002) and with reference to the relevant Austroads publications and Australian Standards relating to road design and road safety. The TIA has been included in **Appendix 12**. The significant findings and recommendations are summarised below.

The objectives of the TIA were to:

- Consider alternative locations for the new Link Haul Road access to the Springvale Coal Services Site, including alternative locations for the proposed Link Haul Road bridge crossing the Castlereagh Highway;
- Consider the impacts of alternative locations for the new Link Haul Road for traffic on the Castlereagh Highway;
- Assess the potential traffic impacts on the capacity, efficiency and safety of the road network; and
- Describe measures that will need to be implemented to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area over the life of the Project.

9.5.10.2 Existing traffic levels, road conditions and traffic safety

Castlereagh Highway Traffic

The Castlereagh Highway runs through the northern section of the Springvale Coal Services Site. Vehicle access to the site is via an existing local access road that intersects with the Highway. Similarly, vehicle access to the Springvale Coal Mine is via a local access road off the Highway. Vehicle access to the Angus Place Colliery is via Wolgan Road, off the Castlereagh Highway.

The Annual Average Daily Traffic (AADT) on the Castlereagh Highway south of the Boulder Road intersection, which is located approximately 1.6km to the north-west of the Springvale Coal Services Site, is 4,300 vehicles per day (vpd), of which 17% are heavy vehicles. According to the TIA the average traffic is 430 vehicles per hour (vph).

Springvale Coal Services Site Traffic

The Springvale Coal Services Site has 15 employees that work over three shifts. This corresponds to 36 vpd (light vehicles, in both directions). The TIA assumes that 5 employees per shift arrive and leave within 10mins of each other in separate vehicles. Hence the hourly rate is 10 vph (combined entry and exit) during peak times. There is also 50,000 tpa dispatched from the site via the Castlereagh Highway. Assuming 30T per vehicle over 260 days, the annual average daily traffic is 14 vpd (both directions). Vehicle access to the site is via a local access road off the Castlereagh Highway. The hourly rate is 2 vph (combined entry and exit) during peak times.

Springvale Coal Mine Traffic

The Springvale Coal Mine site currently employs approximately 280 employees and up to 70 contractors over 3 shifts. This corresponds to 700vpd (light vehicles, both directions). The TIA assumes that all shift employees per shift arrive within 20mins of each other in separate vehicles, the hourly rate is 116 vph during peak times in each direction. Vehicle access to the site is via a local access road off the Castlereagh Highway. Approval is currently being considered to increase production up to 4.5 Mtpa. No coal is dispatched from the site via the public road network from the main mine site surface facilities.

Angus Place Colliery Traffic

The Angus Place Colliery currently employs 225 permanent staff and 75 temporary contractors over 3 shifts. This corresponds to 600 vpd (light vehicles, both directions). The TIA assumes that all shift employees arrive within 20 mins of each other in separate vehicles, and hence the hourly rate is 150 vph during peak times. Vehicle access to the site is via Wolgan Road off the Castlereagh Highway. No coal is dispatched from the Angus Place Colliery site via the public road network.

Lidsdale Siding

The Lidsdale Siding currently employs 20 permanent staff and contractors. This corresponds to 40 vpd (light vehicles, both directions). The TIA assumes that all employees arrive within 20mins of each other in separate vehicles, and hence the hourly rate is 20 vph during peak times. Vehicle access to the site is via Main Street, Wallerawang. Exact traffic volumes for Main Street, Wallerawang are not known. For the purposes of analysis,it has been assumed there are 2,000vpd, or 200vph (combined for both directions) at the Lidsdale Siding entrance.

Existing Road Conditions

Access to the Springvale Coal Services Site is via a 90° T-Junction intersection with the Castlereagh Highway. The speed environment at the intersection is 100km/hr. For vehicles entering the site via a left turn, the intersection generally complies with AUSTROADS Guidelines for an Auxiliary Left turn (AUL) manoeuvre. For vehicles entering the site via a right turn, there is an outside slip lane for passing vehicles. The length and dimension of the slip lane generally comply with AUSTROADS Guidelines for an Auxiliary Right turn (AUR) manoeuvre; however, the current line-marking does not. For vehicles exiting the site via a left turn, the intersection generally complies with AUSTROADS Guidelines for a rural basic left turn treatment (BAL) manoeuvre. For vehicles exiting the site via a right turn, the intersection generally complies with AUSTROADS Guidelines for a rural basic right turn treatment (BAR) manoeuvre. There is also an entrance to the Pine Dale Coal Mine approximately 50 m east of the intersection, on the northern side of the Castlereagh Highway. The stagger distance between the two intersections does not comply with AUSTROADS Guidelines. The road pavement at the intersection is a two coat seal and is in reasonable condition however, it is showing signs of deterioration. The access road within the Springvale Coal Services Site is gravel. There is also culvert with guardrails adjacent to the southern approach to the intersection. Sight distances from the access road intersection with the Castlereagh Highway are in excess of 300 m in both directions.

Access to the Springvale Coal Mine site is via a 90° T-Junction intersection with the Castlereagh Highway. The speed environment at the intersection is 100 km/hr. For vehicles entering the site via a left turn, the intersection generally complies with AUSTROADS Guidelines for a Channelised Left turn manoeuvre. For vehicles entering the site via a right turn, there is an outside slip lane for passing vehicles. The length and dimension of the slip lane generally comply with AUSTROADS Guidelines for an Auxiliary Right turn (AUR) manoeuvre. For vehicles exiting the site via a left turn, the intersection generally complies with AUSTROADS Guidelines for a rural basic left turn treatment (BAL) manoeuvre. For vehicles exiting the site via a right turn, the intersection generally complies with AUSTROADS Guidelines for a rural basic right turn treatment (BAR) manoeuvre. The road pavement at the intersection is asphaltic concrete and is in excellent condition. There are sealed road shoulders with concrete dish drains both sides. The access road to the Springvale Coal Mine site is a two coat sealed road. Sight distances from the access road intersection with the Castlereagh Highway are in excess of 300 m in both directions.

Angus Place Colliery is located on Wolgan Road, Lidsdale. Access to Wolgan Road is via the Castlereagh Highway. The intersection also provides access to local residents of Lidsdale. The speed environment at the intersection is 80 km/hr. The intersection forms a staggered T-arrangement with Main Street, Wallerawang. Combined, the intersection has a combination of acceleration/deceleration lanes, as well as channelised left and right turns. The road pavement at the intersection is asphaltic concrete and is in excellent condition. The intersection has sealed road shoulders with concrete dish drains, guard-railing and lighting.

Wolgan Road is a two coat sealed road which passes through Lidsdale. The Angus Place Colliery site is approximately 5.4 km north of the Wolgan Road/Castlereagh Highway intersection. Wolgan Road has varying lane widths (3.25 m – 3.5 m) and is in reasonable condition. There is centreline marking from the Wolgan Road/Castlereagh Highway intersection through to the Colliery entrance. There are edge line markings through Lidsdale village, but no edgelines after the Maddox Lane intersection. The speed limit is 50 km/hr up until the Maddox Lane intersection. Beyond Maddox lane, the speed limit is 80 km/hr.

Lidsdale Siding is located off Main Street, Wallerawang. The Main Street intersection forms a staggered T with the Castlereagh Highway and Wolgan Road. The Lidsdale Siding entrance is approximately 675m south of the Castlereagh Highway. The entrance to the Lidsdale Siding is a 90° T, in a 50km/hr speed zone with street lighting. Main Street has a 10m sealed pavement width at the intersection and there is no specialised intersection treatment, however there is street lighting.

Traffic Safety

According to the TIA there have been no accidents at the Springvale Coal Services Site access road/Castlereagh Highway intersection. However there have been 4 accidents within 500 m of the intersection. Of these, 3 involved injury, whilst the other was a tow-away only.

For the Castlereagh Highway section adjacent to the Springvale Coal Mine and Lidsdale Siding entrance, there have been no accidents in the last 5 years. There have been no accidents within 500 m of these existing intersections.

For Wolgan Road, there have two accidents in the last 5 years. One accident was alcohol related whereas the other involved a kangaroo.

Private Haul Roads

As mentioned in Section 3.3.5 and illustrated in **Figure 3**, a private haul road links Angus Place Colliery with Wallerawang and Mt Piper Power Stations. All coal produced at Angus Place Colliery is loaded into trucks and transported directly to either Wallerawang or Mt Piper Power Stations. The Angus Place to Mt Piper Private Haul Road is owned by Coal>Link Pty Ltd, who obtained a planning consent for its construction. The Angus Place to Wallerawang Private Haul Road is owned by Angus Place Colliery. Currently, planning

controls covering the operation of the roads is held under the Angus Place Colliery consent for the road leading from the Angus Place truck loading bin to Wallerawang Power Station. Centennial has a commercial agreement with Coal Link for the use of the Mt Piper Power Station haul road.

9.5.10.3 Traffic Impact Assessment – Public Roads

A slight increase in both light vehicles entering and exiting the Springvale Coal Services Site is expected due to additional staff numbers whilst there would also be a slight increase in heavy vehicles during the construction phase. To offset this, there will be no coal transported on the public road network after construction is complete.

The Springvale Coal Services Site currently employs 15 employees over 3 shifts. An additional 3 permanent positions will be created as a result of the completion of the infrastructure. The TIA assumes that this will equate to an additional 1 person per shift, and a related increase in traffic volumes of 2 vpd, and 2 vph.

During the construction phase, it is expected that an additional 50 vpd will access the Springvale Coal Services Site (100 vpd combined entry/exit movements) over an 18-month period. For a 3-month window during construction, this will peak at 120 vpd (or 240 vpd combined). Assuming all construction vehicles enter and leave the site over 4 hours only, the hourly rate is 60 vph. In addition, the current transport of up to 50,000 tpa of coal to domestic customers using the public road network will cease, reducing traffic volumes by 14vpd and 2vph respectively.

In relation to both Springvale Coal Mine and Angus Place Colliery no increase in personnel is proposed nor any construction activities planned as a result of this Project. In relation to Lidsdale Siding the Project will creat an additional 10 full-time employees and / or contractors.

A summary of the proposed traffic volumes during the construction phase as it relates to the Springvale Coal Services Site, Springvale Coal Mine, Angus Place Colliery and Lidsdale Siding is shown in **Table 57**.

Table 57 Summary of General Traffic Volumes during Construction Phase

Location	Existing/Proposed vpd	Existing/Proposed vph
Springvale Coal Services Site	50/38	12/12
Springvale Coal Mine	700/760	233/253
Angus Place Colliery	600/600	300/300
Lidsdale Siding	40/60	20/30

A summary of the proposed traffic volumes during the peak construction phase as it relates to the same sites is shown in **Table 58**.

Table 58 Summary of Peak Traffic Volumes during Construction Phase

Location	Existing/Proposed vpd	Existing/Proposed vph
Springvale Coal Services Site	50/88	12/72
Springvale Coal Mine	700/760	233/253
Angus Place Colliery	600/600	300/300
Lidsdale Siding	40/60	20/30

9.5.10.4 Traffic Impact Assessment – Intersections

Springvale Coal Services Site Intersection

As indicated in **Table 57** and **Table 58**, the existing and proposed traffic volume would be 12 vph. In this instance the increase in traffic movements due to additional staff numbers at the Springvale Coal Services Site is offset by the elimination of coal transport via the public road network. The TIA assumes that 100% of all vehicles will arrive from the east and the critical turning movements for vehicles would be the right turn out onto the Castlereagh Highway. Therefore the minor stream traffic would be approximately 6vph (exit movements). The major stream flow would be 4300vpd, or 430vph. Based upon RTA Guide to *Traffic Generating Developments* (2002) and with reference to the relevant Austroads publications and Australian Standards, no additional treatment to the intersection is required. The TIA acknowledges that up to 72vph will access the site during the construction phase which could be managed by the implementation of a construction traffic management plan.

Springvale Coal Mine Intersection

As indicated in **Table 57** and **Table 58** the proposed traffic volume would be 253 vph (116vph in each direction) due to additional staff numbers. The TIA assumes that 75% of all vehicles would arrive from the east and the critical turning movements for vehicles would be the right turn into the site from the Castlereagh Highway. The minor stream (turning) volume would therefore be 87vph. The major traffic volume would be 430vph. Based upon the relevant Austroads publications and Australian Standards, an intersection upgrade to the intersection would normally be required. The proposed traffic increase however, is approximately 8% and the intersection was originally constructed generally in accordance with the NSW Road Design Guide where 'AUR' type arrangements were permissible. In addition, there have been no recorded accidents in the vicinity of the intersection. The TIA therefore concludes that no intersection upgrade is recommended in this location.

Angus Place Colliery Intersection

As indicated in **Table 57** and **Table 58** no increase in traffic volume is proposed with approximately 150vph (each direction) accessing the site. As this would constitute the majority of traffic volume along Wolgan Road the intersection complies with the relevant Austroads publications and Australian Standards. The TIA therefore concludes that no intersection upgrade is recommended in this location.

Lidsdale Siding Intersection

As indicated in **Table 57** and **Table 58** there would be 15vph (each direction) accessing the Lidsdale Siding Site. As the intersection currently complies with the relevant Austroads publications and Australian Standards the TIA concludes that no intersection upgrade is recommended in this location.

9.5.10.5 Traffic Impact Assessment – Private Haul Roads

As described within Section 8 and illustrated in **Figure 22** of the EIS, two alternate Link Haul Road routes linking the Springvale Coal Services Site with the existing private haul road from Angus Place Colliery to Mt Piper Power Station have been considered during the EIS preparation. Option Route 1 is adjacent to the existing heavy vehicle entry/exit into Pine Dale Mine and approximately 300m west from the nearest residence at Blackmans Flat. It is understood that Pine Dale Mine is currently seeking approval for expansion, and additional traffic will be generated at this location. Option Route 2, however, is approximately 650m west from the nearest residence at Blackmans Flat. The TIA concludes that Option Route 2 is, from a traffic perspective, the preferred location because:

- It will not conflict with the existing heavy vehicle entry/exit of Springvale Coal Services Site;
- It is an additional 350m further west from the Option Route 1 location, thus reducing the impacts of dust and noise impacts for residents of Blackmans Flat; and
- That section of road has been recently upgraded and there is an existing 3m wide sealed shoulder both sides with guard-railing on northern side.

The proposed Link Haul Road will cater for 6Mtpa of coal transportation. Of this:

- 4 Mtpa may be transported from Angus Place to the Springvale Coal Services Site;
- 1 Mtpa of reject may be transported from the Springvale Coal Services Site to be be emplaced at the Neubeck Open Cut site; and
- 1 Mtpa may be transported from other sources eg Nuebeck (SSD 12_5508) to the Springvale Coal Services Site.

The private haul road trucks will have an average payload of 60 tonnes. A summary of the typical breakdown of anticipated vehicle movements along the Link Haul Road are shown in **Table 59**. Actual hourly movements will be determined by potential noise impacts on residential receptors. However, based on these numbers, the total vehicle movements on the Link Haul Road is well within their carrying capacity.

Table 59 Breakdown of Anticipated Vehicle Movements along the Link Haul Road

Location	Proposed Haulage Vehicles Per Day[1]
Angus Place to Springvale Coal Services	**374**
Daytime	(220)
Evening	(64)
Night	(90)
Nuebeck to Springvale Coal Services	**96**
Daytime	(44)
Evening	(16)
Night	(36)
Coal Services Site to Rejects	**96**
Daytime	(44)
Evening	(16)
Night	(36)

All vehicle rates shown are for combined entry/exit movements.

9.5.10.6 Consequence of Potential Road Traffic Impacts

The Project will result in a slight increase in light vehicles entering and exiting the Springvale Coal Services Site due to additional staff numbers. There will also be a slight increase in heavy vehicles during the construction phase. To offset this, there will be no coal transported on the public road network after construction is complete. With the implementation of a Construction Traffic Management Plan, there will be no consequences arising from the Project on the existing road conditions or on traffic safety.

9.5.10.7 Road Traffic Management and Mitigation Measures

The TIA indicates that the Springvale Coal Services Site access road/Castlereagh Highway intersection has adequate capacity to cope with existing and projected traffic levels. It is also noted that there were no accidents at this intersection for the period of crash data used. Impact on the existing traffic environment is associated with the construction phase on the Springvale Coal Services Site only and can be managed by the implementation of a Construction Traffic Management Plan. The following recommendations are made by the TIA:

- Construction of the Link Haul Road and overpass in the location, illustrated by Option Route 2 in **Figure 22**;
- The construction of the Link Haul Road overpass be in accordance with AUSROADS guidelines;
- All construction sites associated with the infrastructure upgrade prepare and implement a Construction Traffic Management Plan; and
- Upgrade Springvale Coal Services intersection line-marking to RMS standards.

It is noted that the TIA does not recommend additional traffic safety mitigation measures.

9.5.10.8 Conclusion

The Project will result in a slight increase in light vehicles entering and exiting the Springvale Coal Services Site due to additional staff numbers. There will also be a slight increase in heavy vehicles during the construction phase. To offset this, there will be no coal transported on the public road network after construction is complete. Considering these points, and with the above mitigation measures in place, Springvale Coal believes that there are no traffic constraints relating to the Project.

9.5.11 Agriculture

9.5.11.1 Introduction

The Project BBRA considered that the upgrading of the Washery, construction of a new Link Haul Road, construction of an enlarged REA and associated works to be *low risk* to agriculture. The BBRA considered that the Springvale Coal Services Site has been heavily disturbed by previous mining activities and possesses no agricultural capability while the existing infrastructure consisting of the overland conveyors and private haul roads and the operation at Kerosene Vale would not be altered, expanded or otherwise further impact on agricultural land.

GSS Environmental was engaged by Springvale Coal to prepare an Agricultural Assessment for the Project, a copy of which is in **Appendix 13.** The Assessment was undertaken in response to the NSW Strategic Regional Land Use Policy. Under this policy, all new mining related Project applications are required to undertake agricultural productivity impact assessments as part of their EIS. As the Project lies outside any existing Strategic Regional Land Use Plans (SRLUP), the assessment evaluated physical agricultural productivity via land capability and agricultural suitability assessment.

9.5.11.2 Existing Environment

The PAA lies on the central western edge of the Sydney Basin within the Illawarra Coal Measures and the siltstone-dominated Berry Formation, which overlies the Megalong Conglomerate to form the Shoalhaven Group. Areas within the Illawarra Coal Measures consist of shale and sandstone in addition to conglomerate, limestone, dolomite, claystone, mudstone, coal and torbanite. Areas within the Berry Formation consist of grey siltstone with thin beds of limestone and sandstone. Unconsolidated alluvium overlying the Illawarra Coal Measures in the drainage areas and their associated floodplains consist of shale, sandstone, conglomerate, limestone, dolomite , claystone, mudstone, coal and torbanite. Soil Landscapes occurring in on the site are classified as *Cullen Bullen* and *Lithgow* and are described below.

Cullen Bullen Soil Landscape topography – characterised by broad rolling low hills and rises, local relief less than 50 metres and slopes at 10 to 25 percent, and is described as follows:

- Shallow to moderately deep Yellow Podzolic soils and Yellow Earths occurring on crests;
- Moderately deep Yellow Podzolic soils, Soloths and Yellow Leached Earths on upper and mid-slope areas;
- Moderately deep to deep Yellow Solodic soils and Yellow Podzolic soils on lower slopes near and along narrow drainage lines; and
- Shallow Yellow Earths and Lithosols associated with low scarps.

Lithgow soil landscape topography – characterised by flat to gently inclined rises on broad valley floors, local relief less than 25 metres and slopes less than 10 percent, and described as:

- Moderately deep Red Podzolics, Yellow Podzolics and Yellow Leached Earths on upper slopes and well-drained areas; and
- Moderately deep to deep Solods/Yellow Solodic soils on lower slopes and in areas of poor drainage.

A significant amount of disturbed terrain from previous mining has also influenced soil distribution within the Springvale Coal Services Site. Most of the original soil in these areas has been removed, buried or greatly disturbed. It is understood from historic records that the original soils occurring at the Springvale Coal Services Site were generally shallow silty loams overlying weathered mudstones and sandstones. The depth of the soils varied from bare outcrop to up to 1 m, with an average reported depth of approximately 0.5 m. Both silty loam topsoils and silty clay loam subsoils have limited structure, and are susceptible to erosion.

The soils would have had low nutrient and mineral levels and in some cases low pH where exposed to the Irondale Seam prior to its removal by the Lamberts Gully Open Cut. There was no evidence of soil salinity issues both prior to the open cut operation and since rehabilitation post mining, indicating that salinisation is not present.

9.5.11.3 Soil and Land Capability Impact Assessment

The Agricultural Assessment included a site inspection, assessment of aerial photographs and topographic maps, as well as an assessment of previous land mapping and related resources. The Agricultural Assessment incorporated two assessment processes to evaluate physical agricultural productivity:

- Land capability classification – conducted in accordance with the relevant guideline by the OEH – *Systems used to classify rural lands in New South Wales*; and
- Agricultural suitability classification – conducted in accordance with relevant guideline by the NSW DTIRIS – *Agricultural Suitability Maps – uses and limitations*.

From a Land Capability perspective, the vast majority of the site is classified as *Class M*, which is land disturbed by mining and quarrying. Some remnant forest areas occur within the Site. These areas are classified as *Class VII*. The land is considered unsuitable for rural production. A Rural Land Capability classification plan of the Site is provided in **Figure 46.**

From an Agricultural Suitability perspective, the classification of the Springvale Coal Services Site is *Class 5*. This class of land is marginal land not suitable for cultivation and has very low potential for grazing production. The Site is characterised by mining related infrastructure, disturbed areas due to mining and remnant forested areas.

There is currently no agricultural production or forestry within the Springvale Coal Services Site and no Strategic Land in accordance with the NSW Strategic Land Use Policy.

9.5.11.4 Impact Assessment

The land capability and agricultural suitability assessment has classified the Project area as unsuitable for rural production, and not suitable for cultivation or grazing, respectively. Therefore, there are no significant potential impacts on current land use or agriculture from the Project.

The impact on soils and topography is considered negligible as the proposed development is surface infrastructure which can be removed and the land rehabilitated at closure as required.

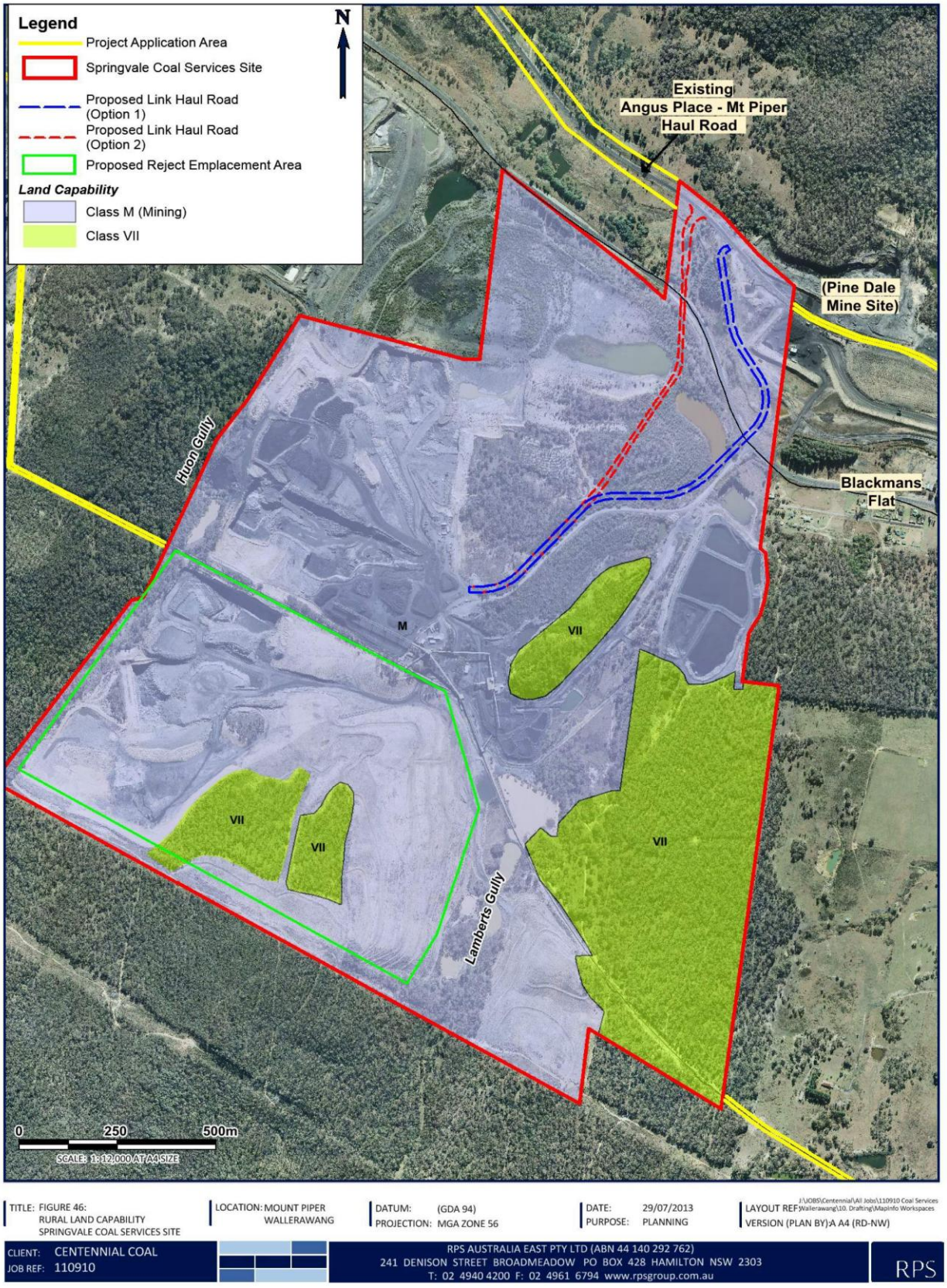
9.5.11.5 Management and Mitigation Measures

As it has been determined that there are no significant potential impacts on current land use or agriculture due to the Project, no agriculture-specific mitigation measures are required. Mitigation of any potential impacts on soil and topography will be achieved through the development of appropriate erosion and sediment control strategies.

9.5.11.6 Conclusion

Given the non-suitability of the Site for agricultural production, there are no significant potential impacts on current land use or agriculture from the Project.

Figure 46 Rural Land Capability Classification Plan



9.5.12 Greenhouse Gas

9.5.12.1 Introduction

The BBRA for the Project considered that a significant increase in GHG emissions and associated impacts was low risk. Nevertheless a quantitative GHG Assessment (GHGA) for the Project was undertaken by Pacific Environment and was included in the AQGHGA included in **Appendix 3**.

The GHGA has been undertaken in accordance with the Greenhouse Gas Protocol Initiative (GHG Protocol) which provides internationally accepted GHG accounting and reporting standards for business and to promote their broad adoption.

The GHG Protocol defines three scopes of emissions that are established for GHG accounting and reporting purposes, defined as follows:

Scope 1 emissions

Scope 1 emissions, sometimes referred to as direct GHG emissions, are emissions from activities under the Proponent's control or from sources which they own. Scope 1 Emissions are principally a result of the following activities:

- Generation of electricity, heat or steam. These emissions result from the combustion of fuels in stationary sources, e.g. boilers, furnaces or turbines;
- Physical or chemical processing. The majority of these emissions result from the manufacture or processing of chemicals and materials e.g. the manufacture of cement, aluminium etc;
- Transportation of materials, products, waste, and employees – These emissions result from the combustion of fuels in company owned/controlled mobile combustion sources (e.g. trucks, trains, ships, airplanes, buses, and cars); and
- Fugitive emissions – These emissions result from intentional or unintentional releases, e.g. equipment leaks from joints, seals, packing, and gaskets; carbon dioxide and methane emissions from coal mines and venting; hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport.

Scope 2 emissions

Scope 2 emissions in relation coal mining and coal handling and transport typically covers emissions that relate to the generation of purchased electricity consumed in owned or controlled equipment or operations. For many companies, purchased electricity represents one of the largest sources of GHG emissions and the most significant opportunity to reduce these emissions.

Scope 3 emissions

Scope 3 emissions are emissions which do not result from the activities of a company but arise from sources not owned or controlled by the Proponent. Examples of Scope 3 emissions include the extraction and production of purchased materials, transportation of purchased fuels and the use of sold products and services.

The GHG emissions associated with the Project have been assessed in terms of Scope 1, Scope 2 and Scope 3 emissions as outlined above.

9.5.12.2 Existing Environment

The data used for the GHGA was provided to Pacific Environment by Springvale Coal. Activity data for the period between July 2011 and the forecast to the end of June 2016 was used in the GHGA and is referred to as the Project 'base case'.

Project related GHG assessed for the Project included the following:

- Emissions from combustion of fuel by on-site vehicles used to transport staff and materials associated with operations and to handle and manage coal stockpiles – Scope 1;
- Emissions from the use of Liquefied Petroleum Gas (LPG), sulphur hexafluoride (SF6) and oils and greases – Scope 1;
- Electricity use – Scope 2 and 3; and
- Indirect emissions from the combustion of the coal produced by the site – Scope 3.

The GHGA notes that the Springvale Coal Services Site is likely to wind down in operations towards the end of its 25 year mine life.

9.5.12.3 GHG Impact Assessment

The total GHG emissions associated with the Project is presented in the **Table 60.**

GHG emissions have been calculated for the following:

- On site fuel consumption by plant and equipment;
- LPG;
- Employee travel;
- Fugitive emissions from Sulphur hexafluoride;
- Fugitive emissions from oils and greases;
- Electricity;
- Coal transportation; and
- Burning product coal.

Table 60 Total of Estimated CO_2-e (tonnes) – All Scopes

Year	Scope 1 Emissions (t CO_2-e)					Scope 2 Emissions (t CO_2-e)	Scope 3 Emissions (t CO_2-e)					
	Diesel	Oils & Greases	LPG	Staff Transport	*Total*	Electricity	Diesel	Staff Transport	Electricity	Energy Production	Rail	*Total*
Base-case year	4,506	263	99	102	*4,970*	13,256	343	8	2,711	4,653,128	6,848	*4,663,031*
1	4,855	205	145	119	*5,324*	12,535	370	9	2,564	20,294,685	22,137	*20,319,756*
2	4,855	205	145	119	*5,323*	12,535	370	9	2,564	20,682,295	22,137	*22,707,366*
Annual Year 3 to 25	4,855	205	145	119	*5,323*	12,535	370	9	2,564	20,682,295	22,137	*22,707,366*
Total	**121,367**	**5,119**	**3,621**	**2,975**	**133,082**	**313,383**	**9,238**	**227**	**64,101**	**564,669,765**	**553,434**	***565,296,537***

Emissions of GHG in NSW were reported to be 160.5 Mt in 2009 which is approximately 28% of the Australian total GHG emissions of 564.5 Mt.

A summary of the total GHG emissions associated with the Project are presented in **Table 60**. The emissions from the burning of coal will be much larger than those associated with the extraction and processing of coal. These are indirect emissions (Scope 3) from sources not owned or controlled by Springvale Coal and therefore optional for reporting purposes. Measures to minimise or reduce these emissions cannot be made by Springvale Coal.

9.5.12.4 Consequences of Potential GHG Impacts

The Projects contribution to projected climate change and the associated impacts would be in proportion with its contribution to global GHG emissions. Average annual Scope 1 emissions from the Project (0.005 Mt) CO 2-e) would represent approximately 0.001% of Australia's commitment under the Kyoto Protocol and a very small proportion of global GHG emissions given that Australia contributed approximately 1.5% of global GHG emissions in 2005.

The commitment from the Australian Government to reduce GHG emissions is achieved through the introduction of the Australian Government's carbon pricing mechanism. From 1 July 2012 a fixed price on GHG emissions was introduced with no cap on Australia's GHG emissions or emissions from individual facilities.

From 1 July 2015 an emission trading scheme is proposed to be implemented. As such Australia's GHG emissions inclusive of emissions associated with the Project would be capped at a level specified by the Australian Government. Under the emissions trading scheme there will specifically be no limit on the level of GHG emissions from individual facilities with the incentive for facilities to reduce their emissions driven by the carbon pricing mechanism.

9.5.12.5 GHG Management and Mitigation Measures

Springvale Coal is currently implementing a number of reasonable and feasible measures to minimise GHG emissions from the Project. One such measure is the commitment to maximising energy efficiency in the development of the Project. For example, significant savings of GHG emissions (through increased energy efficiency) can be achieved by Project planning decisions which minimise haul distances for ROM coal and waste rock transport, and therefore fuel use. Other measures to minimise GHG emissions from the Project include:

- Springvale Coal will prepare a GHG management plan. The plan will include standards to minimise energy usage and GHG emissions from the Project's operations. The plan will include objectives, commitments, procedures and responsibilities for:
- Assisting in researching and promoting low emission coal technologies;
- Improving energy use and efficiency;
- Consideration of the use of alternative fuels where economically and practically feasible;
- Review of mining practices to minimise double handling of materials and ensuring that coal and overburden haulage is undertaken using the most efficient routes;
- Ongoing scheduled and preventative maintenance to ensure that diesel and electrically powered plants operate efficiently;
- Developing targets for GHG emissions and energy use and monitor and report against these;

- Implementation of a detailed energy monitoring programme. This would include monitoring the electricity and diesel usage on-site to identify the main sources of GHG emissions and apply appropriate reduction mechanisms where possible;
- Regular maintenance of diesel powered equipment to ensure operation at peak efficiency;
- Conducting baseline study of energy use; and
- Assessing lighting plant efficiency.

The effectiveness of these measures to reduce GHG emissions (and energy consumption) will be monitored, as Springvale Coal will annually estimate GHG emissions and energy consumption in accordance with National Greenhouse and Energy Reporting Act 2007 (NGER) and Energy Efficiency Operations requirements.

9.5.12.6 Conclusion

A GHG assessment for the project indicates that average annual direct emissions from the Project (0.005 Mt CO_2-e) would represent approximately 0.001% of Australia's commitment under the Kyoto Protocol (591.5 Mt CO_2-e) and a very small portion of global greenhouse emissions. GHG emissions for a base-case year were estimated and compared to proposed Project years. GHG estimates for all scopes were lower than projected years which is expected considering the proposed increased processing capacity. Springvale Coal will commit to a range of GHG mitigation measures including the completion of a Greenhouse Gas Management Plan (GHGMP) which will include objectives for improving energy use and efficiency, develop targets for GHG emissions and energy use and conduct a baseline study of energy use.

9.5.13 Economics

9.5.13.1 Introduction

AIGIS Group was engaged by Springvale Coal to undertake an Economic Assessment for the Project. A copy of the Assessment is contained within **Appendix 14**.

9.5.13.2 Existing Situation

Springvale Coal Mine and Angus Place Colliery currently supply coal to the Wallerawang and Mt Piper Power Stations, with limited export capability via Lidsdale Siding. Angus Place Colliery currently has no access to export markets, while Springvale Coal Mine has the ability to export using the underside of Overland Conveyor 2 from the existing Springvale Coal Services Site to Lidsdale Siding.

There are also several Centennial mining opportunities in the local area, which could generate up to one Mt per annum of coal that, under present arrangements, could not be transported to Lidsdale Siding or the Springvale Coal Services Site without using the public road network.

It is expected that the upgrade of Springvale Coal Mine (SSD 12_5594) will provide approval to produce 4.5 Mtpa, while the upgrade of Angus Place Colliery (SSD 12 5602) will provide approval for production of 4 Mtpa. At present the source mines produce approximately 4 Mtpa and 3.7 Mtpa respectively. In order to enable Springvale Coal Mine and Angus Place Colliery to achieve full production, improvements to facilities at the Springvale Coal Services Site are required to match coal preparation capacity with production capability from the two mines.

9.5.13.3 Economic Analysis of Impacts

The Economic Assessment considered the context of the Project with respect to other Centennial operations in the Lithgow and adjacent Mid-Western Regional Council LGA's including the LCC Economic Development Strategy. The Economic Assessment also considered Springvale Coal's strategy to manage the cumulative impacts derived from the various incompatible land uses on the residents in the main residential area of Blackmans Flat and noted that a range of other mitigation strategies will be adopted for the Project which will be effective in relation to managing impacts on the broader LGA community.

The Economic Assessment has identified two principal aspects of economic impact related to the Project. These are:

- Short to mid-term effects resulting from economic activity associated with the construction phase; and
- Ongoing direct economic effects associated with utilisation of incremental capacity at the Springvale Coal services Site. In addition, the Springvale Coal Services Site upgrade will facilitate anticipated continuation of production at Springvale Coal Mine and Angus Place Colliery. As such, the upgrade will support ongoing levels of employment and economic activity associated with these mines for the economic life of each mine. The economic stimulus provided by these activities also results in the flow of further activity in the regional, state and national economies, as the goods and services required to support mining activity are produced and supplied, and the incomes received by employees are redistributed through consumption and other economic activity.

As would be expected, Springvale Coal has conducted internal analyses in order to determine the financial and economic feasibility of various Project options. The Project subject of this EIS represents the best of the alternatives considered from the perspective of economic efficiency and commercially and environmentally sustainable development and operations. It should be noted that in developing the economic assessment of the Project, certain information has been used which Springvale Coal considers to be commercially sensitive. Accordingly, the Economic Assessment presents the costs and benefits to the State and regional communities, with corporate financial outcomes excluded.

Two alternative proposals have been considered in detail by Springvale Coal. Additionally, the business-as-usual (BAU) case, in which operations would proceed on their current basis, is also considered. The three cases assessed are:

- Project based on the preferred option, which is the westerly alignment of the Link Haul Road;
- Project including alternative easterly alignment of the Link Haul Road; and
- Do Nothing/ BAU.

A number of other alternative options are not analysed by the Economic Assessment. This results from those options having been determined by Springvale Coal as being of substantially lower feasibility during the process of identifying the current Project options. The principle difference between the two Link Haul Road options is the capital cost. The capital cost of the Project including the western haul road alignment is $104 million, compared with $107.5 million for the eastern alignment. It is noted that there is no material difference in assumptions relating to operations cost modelling or revenue projections for either option.

The BAU option will basically result in export capacity being constrained to the current 2 Mtpa. This will constrain Centennial Coal's opportunities to export coal product in circumstances where domestic supply arrangements may curtail production.

The Economic Assessment identifies key economic benefits that accrue to the local and State communities, as distinct from the proponent corporation, and these are identified as:

- Salaries and wages paid to contract workers in the development phase of the Project. These incomes then support additional activity in other sectors of the economy;
- Estimate of profit accruing to construction contractors engaged on the Project. These profits are then distributed to owners of the entity, with similar flow-on effects to those noted above;
- Salaries and wages paid to full time employees at Springvale Coal Services Site, with similar flow-on effects to those noted above;
- Royalties on product coal which are remitted to the State. These are then redistributed across the State community in the form of publicly-provided goods and services; and
- A range of federally-levied taxes, a proportion of which is similarly redistributed across the State community. These taxes include provision for the carbon tax. As liability for the Mineral Resources Rent Tax (MRRT) is contingent on market demand, the prospect of incurring the tax is acknowledged, but no reliable quantified estimate can be made.

The nominal capital cost of the Project is $104 million, over the development program, as previously identified. This activity will support an average of 50 contract employees over the period. Extended beneficiation operations resulting from the Project will require an additional 3 FTE employees. These effects are the source of significant direct and derived economic benefits and also have positive social and welfare benefits for the local communities in which these employees reside and spend much of their incomes.

In addition to these household income-related benefits, the royalties and taxes generated are also a source of benefit. **Table 61** shows the valuation of these benefits, and the bases of the valuation for each.

Table 61 Economic benefits of the Western Coal Services Project

Economic Benefit	Estimation assumptions	Estimate
Construction-phase contractor employee salaries	Average 50 contract personnel @ ≈ $65K.	Assessed NPV ≈ $2.5 million
Construction-phase contractor profit margin	Assumed as 7.6% of construction cost[4]	Assessed on project cost NPV ≈ $6.8 million
Western Coal Services operation-stage additional employment	Direct additional operations employment: 3 FTE positions, average salary ≈ $110K.	Assessed NPV ≈ $15 million.
Coal royalties (State Government)	Based on assessed output over 25 year mine life, and royalty rate of 6.7%[5]	Assessed NPV ≈ $200.7 million
Federal taxes (Corporate taxes, MRRT)	Based on assessed corporate income & relevant corporate tax rates Total assessed NPV ≈ $410 million	Return to NSW @30.1%: ≈ $123.4 million[6]
Carbon tax (Federal Government)[7]	Scope 1 & 2 emissions 0.014Mtpa per annum @ $23/tonne CO2e. Assessed NPV ≈ $83.5 million	Return to NSW @30.1%: ≈ $25.1 million
Economic benefit		**≈ $374 million**

1 Australian Bureau of Statistics (2012): ABS Cat. No 1301.0 Year Book Australia 2012. Average profit margin on heavy/civil engineering construction 2008-09 (7.6%); 2009-10 (7.6%)

2 Deep underground coal (+400m) 6.2 percent; other underground coal 7.2 percent, open cut coal 8.2 percent. The variance from these standards relates to the mining of coal at various seam depths over mine life in relation to Springvale Mine.

3 Commonwealth of Australia (2012): Budget 2012-13 Budget Paper No 3, Part 3, General Revenue Assistance. Table 3.2 General revenue assistance by State.<http://www.budget.gov.au/2012-13/content/bp3/html/bp3_04_part_3.htm >

4 Carbon tax is separated from other Federal taxes, as it is also adopted as a measure of impact with respect to Greenhouse Gas (GHG) emissions.

The Economic Assessment identified environmental and social factors which may impose costs and benefits on the regional community. Bases for evaluating these costs are described further in **Appendix 14. Table 62** provides a summary of the environmental and social impacts, lists the benefits and costs of the Project in relation to each impact and lists the mitigation and or treatment required for each impact.

Table 62 Economic Impact Assessment – Summary Table

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Infrastructure construction and commissioning	The development phase of the project will have an overall positive economic contribution at a regional level and also to the local community.	Actual capital expenditure: Westerly haul road alignment: $104 million (NPV $88.9 million) Direct construction employment: Average 50 FTE over 2 years @ ≈ $65K, (NPV ≈ $2.5 million [construction period 2014-2015])	Outcomes of project and incremental NPV positive, therefore development costs neutralised. Economic benefits may not mitigate cumulative impacts on the most affected residents (of Blackmans Flat)	Nil required Mitigation of impacts on residents of Blackmans Flat through a strategy to manage the cumulative impacts of the various incompatible land uses in the area is discussed in relevant sections of this EIS.
Western Coal Services operations	The project will have an overall positive economic contribution at a regional level and also to the local community	Direct additional operations employment: 3 FTE positions, average salary ≈ $150K (NPV ≈ $15 million [20 years]) Additional royalty income to NSW associated with increased output: ≈ $200.7 million. Additional company tax ≈ $400 million. Estimated ≈ $120.4 million returned to NSW. Positive economic impact of mining industry acknowledged by LCC	Outcomes of project and incremental NPV positive, therefore development costs neutralised. Economic benefits may not mitigate cumulative impacts on the most affected residents (of Blackmans Flat)	Mitigation of impacts on residents of Blackmans Flat strategy to manage the cumulative impacts of the various incompatible land uses in the area is discussed in relevant sections of this EIS.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Noise	Operational noise: likely residual noise impacts above INP project specific criteria Sleep disturbance: goals likely to be achieved at all but three (3) residential receivers. Traffic noise: change in noise level not discernible to most people. Construction noise: predicted construction noise levels are below the highly noise affected level for the scenarios considered.	Mitigation strategy will reduce impacts to lowest practicable level.	Noise affectation zone: > 5dBA above project specific criteria; maximum exceedance 11dBA. 5 residential receivers, notional cost $10,780 Noise management zone: < 5dBA above project specific criteria (average 3dBA). 9 residential receivers, notional cost $5,292 Total notional cost of noise impacts: $16,072 per annum, NPV ≈$182K	Springvale Coal/Centennial EMS Noise Management Plan (Springvale Coal Services Site) Noise Management Plan (Haul Roads) Community consultation. Direct engagement with relevant property holders as required. Refine onsite noise mitigation/operational procedures. Acoustical mitigation at receivers. Negotiated agreements with property holders.
Soil and water	Assessed risk of impacts ranges from very low to moderate. Sources of moderate risk restricted to existing Springvale Coal Services Site footprint, except for mine water discharge into Wangcol Creek. Waters in Wangcol Creek contaminated both upstream and downstream of the Springvale Coal Services Site.	Mitigation strategy will reduce impacts to lowest practicable level.	Relates principally to mine water discharge into Wangcol Creek. Notional cost to community (Lithgow LGA): $1,160,263, NPV ≈$16 million.	Springvale Coal/Centennial EMS Water Management Plan (Springvale Coal Services Site) Erosion & Sediment Control Plan Subsurface Drainage Management Plan (Springvale Coal Services Site) Commitments to EPA to conduct further investigations.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Traffic and transport	Major impact on the existing traffic environment would be during the construction phase only No additional haul truck movements on public road network.	Haul road link will not increase reliance on public road network.	Notional & actual costs to community captured in noise, air quality, and GHG emissions assessments.	Construction of haul road overpass (Castlereagh Highway) in accordance with AUSROADS guidelines. All construction sites to implement construction traffic management plan. Springvale Coal/Centennial EMS
Air	Nearest sensitive receptors at Blackmans Flat are unlikely to experience dust concentrations above the PEA's air quality assessment criteria. There are not predicted to be any exceedances of the annual criteria for PM_{10}, TSP or deposition at Blackman's Flat.	Mitigation strategy will reduce impacts to lowest practicable level.	$1,098 per capita per annum - 16 identified residential properties, assumed total population of 47 individual residents[1] . Notional cost to community: $51,606 per annum, NPV ≈ $1.9 million	Springvale Coal /Centennial EMS Dust Management Plan Springvale Coal Services: Watering of unpaved haul roads and bulldozer routes and possibly exposed areas. General Environmental Management Procedures (Springvale Coal Services Site) Environmental Monitoring Plan Largest practical payload capacities to reduce number of movements Strategy to manage the cumulative impacts from

[1] ABS 2011 Census data: Persons per household for Lidsdale State Suburb (incorporating Blackmans Flat Gazetted Locality): 2.9 persons/household.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
				the various incompatible land uses on these residents
GHG production	Emissions equal approximately 0.008% of NSW emissions (2008); 0.002% of Australian emissions (2008).	Increase in Commonwealth taxes (carbon tax) revenues $83.5 million (life of project NPV)	Scope 1 & 2 emissions 0.014Mtpa per annum @ $23/tonne CO_2e. Notional cost $9 million per annum[2], NPV ≈ $83.5 million (equivalent to tax revenue benefit).	Springvale Coal/Centennial EMS Emissions reduced due to larger truck payloads and lower number of movements associated with haul road changes. Some marginal reductions due to altered operations model.
Heritage	9 identified Aboriginal sites within SCS site boundaries. The only area that may contain relics would be that associated with the new haul road. The relevant area has had significant land disturbance from previous mining operations dating back to the 1920's.	No impacts anticipated due to historical site degradation	Notional cost to community (Lithgow LGA): $1,234 per annum, NPV ≈ $21K	Springvale Coal/Centennial EMS Cultural Heritage Plan

[2] Assumes carbon tax rate as a proxy for the externality cost imposed on the relevant community.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Biodiversity (Flora & fauna)	After due consideration against the relevant key thresholds assessment criteria as set out within *Draft Guidelines for Threatened Species Assessment for Part 3A Applications*, the proposal is expected to have minimal impacts on the ecology of the site. Assessments have concluded that no significant impacts are likely to relevant threatened species or EECs listed under the TSC Act 1995 or MNES.	No significant impacts anticipated.	Potential removal of maximum 30.95Ha of native vegetation. Possible impacts on two vulnerable flora species, two endangered fauna species and three vulnerable fauna species. Notional cost (upper bound): $16,353 per annum (Lithgow LGA), NPV ≈ $251K	Springvale Coal/Centennial EMS General Environmental Management Procedures Haul Road Link Option 1 adopted, resulting in lesser impacts. Clearing for project to be minimised. Erosion and sedimentation controls. Ongoing monitoring for weed infestations
Visual amenity	The Project will introduce a new element into the landscape external to the WCS site, being the new private haul road, which will cross the Castlereagh Highway near the current entrance road to the Springvale Coal Services Site. Dwellings within Blackmans Flat will potentially view some elements. Field survey revealed that existing built elements, vegetation and intermediate ridges within the landscape will naturally screen views through to and across the site. The proposed elements will be satisfactory in the environment where appropriate rehabilitation and mitigation measures are taken.	No impacts anticipated	Estimate calculated on basis of area of site to be potentially disturbed. Residents of Blackmans Flat chiefly affected, with some possible impacts on residents of Lidsdale. Notional cost to the community: ≈$39,990 per annum, NPV ≈ $436K	Existing built elements, vegetation and intermediate ridges within the landscape will naturally screen views through to and across the site. Strategy to manage the cumulative impacts from the various incompatible land uses on these residents discussed in relevant sections of this EIS.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Agricultural land	Areas that have been subject to previous mining which are not required for the ongoing operation of the Springvale Coal Services Site will be rehabilitated. The rehabilitation program is currently designed to replace previous native forest vegetation communities as the site would be unsuitable for future agricultural activities.	General area will be rehabilitated as bushland (open space).	Due to historic and continuing disturbance of the land, no agricultural or other productive use will be sustained on the rehabilitated land	Springvale Coal/Centennial Environmental Management System Rehabilitation and Landscape Plan (Springvale Coal Services Site)
Land use/ Rehabilitation	The study area has had a long mining history but has also been associated with the disposal of fly ash from Mount Piper Power Station and has approval for Lithgow City Council to use a portion of the Springvale Coal Services Site for municipal waste disposal. The proposed expansion of the reject emplacements will need to use previously mined overburden as final capping material. As there are no remaining topsoil stockpiles, alternative topdressing material will need to be imported to the site or manufactured on site using available overburden.	Rehabilitation to include areas that have previously remained untreated. Rehabilitation strategy includes use of seed stock from threatened native flora. Continued rehabilitation, monitoring and reporting in relation to the Lamberts Gully Mine site.	Due to historic and continuing disturbance of the land, no agricultural or other productive use will be sustained on the rehabilitated land	Springvale/Centennial Environmental Management System Rehabilitation and Landscape Plan (Springvale Coal Services Site) Slope Stability Management Plan (Springvale Coal Services Site) Reject Emplacement Procedure (Springvale Coal Services Site)

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
General resident amenity	The locality of Blackmans Flat is the primary area of affectation for this Project. This is because of the proliferation of power generation and mining activities and associated infrastructure resulting in long standing, significant and unresolvable land use conflicts.	Positive outcome of mitigation strategy will resolve the major land use conflict and result in better amenity outcomes for affected residents	Ongoing impacts on resident amenity (as disclosed throughout this report) are expected should the mitigation approach be unsuccessful.	Strategy to manage the cumulative impacts from the various incompatible land uses on these residents discussed in relevant sections of this EIS.
Waste	The project includes capacity for disposal of reject material from the beneficiation process. Approximately 15 percent of throughput is reject material. Tailings management through existing tailings dams as required. Other wastes (consumables such as lubricants, containers etc) are disposed of through regular collection by licensed contractors	The emplacement of reject material in mine voids forms part of the rehabilitation process	Quantified impacts included in assessment of soil & water and land use/rehabilitation	A proportion of waste material is blended with other coal to produce saleable material. Springvale Coal/Centennial EMS Reject Emplacement Procedure (Springvale Coal Services Site) Hazardous Substances Management Plan
Hazards	Access to the Western Coal Services PAA is restricted, reducing the likelihood of any foreseeable impact on public safety A Bushfire Management Plan applies to all Centennial Coal's operations in the area.	No impacts anticipated	No impacts anticipated	Springvale Coal/Centennial EMS Bushfire Management Plan Inspections and Maintenance Program (Springvale Coal Services Site)

9.5.13.4 Conclusion

The Economic Impact Assessment establishes that the Project will have a positive economic impact on operating outcomes for Springvale Coal. This is principally a result of the role of the Western Coal Services Project providing sustainability of employment at Angus Place Colliery.

Springvale Coal's operations, and the broader mining industry, are critical to the economic sustainability of the Lithgow LGA and the surrounding region. This role is extensively acknowledged in LCC's Economic Development Strategy.

Along with these significant economic benefits, there are number of specific and broader socioeconomic and environmental impacts that have been assessed. In considering these matters, it is important to acknowledge that in each instance Springvale Coal has developed and/or is pursuing mitigatory and/or compensatory strategies to ameliorate impacts.

The notional valuation of these costs indicates that they are of lesser magnitude than the positive benefits to be realised from the Project and its flow-on benefits.

The approaches proposed by Springvale Coal to mitigate relevant impacts may further reduce the level of negative externalities. This is particularly relevant to the residents in the main residential area of Blackmans Flat. Springvale Coal has developed a strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents which will benefit the parties directly involved, the LGA more broadly, and will also entail positive outcomes in terms of intergenerational equity.

9.5.14 Contamination

9.5.14.1 Introduction

The Project BBRA considered that, regarding possible contamination, the upgrading of the Springvale Coal Services Site and associated works to be a *low risk*. AECOM Australia undertook a Phase 1 ESA for the Western Coal Services Project, specifically, the Springvale Coal Services Site. A copy of the Assessment is contained in **Appendix 15**.

The overall objective of the Phase 1 ESA is to evaluate the potential for soil, surface water, and/or groundwater contamination to be present at the Site and assess whether contamination (if present) is likely to be migrating from the Site. The Assessment addresses the potential for soil, surface water and/or groundwater contamination to be present at the Springvale Coal Services Site from current and historical activities and assess the potential for contamination, if present, to be migrating from the Site.

The Phase 1 ESA was conducted in accordance with National Environment Protection Measure (NEPM) Assessment of Site Contamination (1999) with the scope of works including the following tasks:

- Undertaking Site history and background reviews by reviewing historic and current aerial photographs, searching of Land Titles Office records for each Lot within the Site, reviewing planning certificates for each Lot, and reviewing relevant reports pertaining to the environmental status of the Site;
- Review of published soil, geology and topographic maps;
- Review of the NSW EPA website to assess whether the Site, or nearby sites, have been notified to NSW EPA under the Section 60, or have been issued a notice under Section 58 or of the Contaminated Land Management Act (1997);
- Undertaking a search of registered groundwater bores in the vicinity of the Site;

- Undertaking a search of WorkCover dangerous goods license records;
- Undertaking a Site inspection, to identify areas of potential contamination 'ground-truth' background information and undertake any interviews with key personnel at the Site; and
- Qualitative risk assessment based on the desktop review and site inspection.

9.5.14.2 Historic and Existing Environment

The Phase 1 ESA notes that coal mining began at the Site (in the historical Lamberts Gully) in 1942, as part of the old Western Main Colliery area. Coal mining operations have recently ceased, however, coal processing, handling, and reject disposal activities continue. The vast majority of the site is land disturbed by mining, quarrying and coal handling activities.

Historical aerial photographs for the Site indicate coal mining operations have occurred in the vicinity of the Site since the early 1950s.

The Site is owned by several entities and Section 149 Certificates indicate that the land is not within an EPA investigation or remediation area, and is not subject to any investigation or remediation orders or proposals. The Section 149 Certificates also indicate the Site is on bush fire prone land.

The Phase 1 ESA notes the following conditions on the Site:

- Shallow or perched groundwater could potentially occur at the interface between soil/weathered bedrock interface and within alluvial sediments along drainage channels. Groundwater flow is expected to flow to the north and north-east towards Wangcol Creek, which crosses the northern part of the Site (western part of Pine Dale Mine);
- Past and current uses of the Site for mining operations are likely to have resulted in potential soil, sediment and surface water contamination, and potentially groundwater impact in some areas of the Site. However, extensive contamination was not observed during the Site inspection. Potential contaminants of concern identified from the past and current activities at the Site include total petroleum hydrocarbons (TPH) associated with fuel storage; monocyclic aromatic hydrocarbons associated with fuel and solvent storage; polycyclic aromatic hydrocarbons (PAHs) associated with coal waste, lubricating oil and ash from adjacent power station; metals (As, Cd, Cr, Cu, Ni, Hg, Pb, Zn) associated with mine operations; polychlorinated biphenyls associated with historic use of electrical transformers; explosives associated with storage of explosives on site; and asbestos associated with fill material and demolition of former buildings on site;
- Potential off-site sources of contamination include impacts from the Mount Piper Power Station and Ash Emplacement Area located to the west of the Site, and from the un-rehabilitated mine workings to the north of the Site. The nature and extent of these potential impacts (if any) is presently unknown;
- Potential contamination observed at the Site was generally associated with fuel storage and handling, equipment storage and maintenance and surface water runoff from the tailing dams and general Site;
- An investigation in January 2010 reported that Wangcol Creek, located approximately 200 metres north of the Site, was impacted by current and historic mining in the area and that Lamberts Gully Open Cut Mine was also contributing to this impact (GHD 2010). Site Specific Trigger Values (SSTVs) were updated for assessment of selected compounds in surface water collected from upstream and downstream monitoring points (GHD 2012);
- The latest available AEMR for the Lamberts Gully site reported there was no evidence of contaminated or polluted land on the Lambert's Gully Coal Mine (Springvale Coal, 2010);
- Surface water monitoring by Springvale Coal indicates that discharge waters from the Site into Wangcol Creek, both up-gradient and down gradient of the Site, were impacted by metals, namely iron,

manganese, zinc and nickel. GHD (2012) recommended continuing sampling at the upstream location for the abovementioned parameters on a monthly basis for two years to satisfy the requirements of ANZECC and ARMCANZ (2000) and so that the SSTVs can be reviewed. GHD (2012) also recommended that a new monitoring location be included to achieve an appropriate mixing zone for surface water monitoring. GHD (2012) also identified that a further investigation should be conducted for parameters EC, aluminium, iron, manganese, nickel and zinc) that consistently exceed the SSTVs at the downstream monitoring locations. GHD indicated that the aim of the investigation would be to identify the source of the contaminants and determine whether the elevated concentrations are adversely impacting on the downstream waters of Wangcol Creek;

- The qualitative risk assessment indicated that potential contamination at the Site currently presents a low to moderate risk to human health and the environment; and
- Previous investigations indicated that there was currently not enough information or evidence of contamination at Lambert Gully Mine to warrant notification pursuant to Section 60 of the Contaminated Land Management (CLM) Act. Further investigation was recommended to assess the presence of contamination, if any, and enable a determination to be made regarding Springvale Coal's duty to report (AECOM, 2010b). As part of Springvale Coal's general due diligence, a notification under Section 60 of the CLM Act was lodged with NSW Environment Protection Authority (EPA) on 2 February 2012. The NSW EPA responded to Springvale Coal's acknowledging receipt of the Duty to Report letter and Springvale Coal's commitment for further investigations.

AECOM completed a Phase 2 ESA of the Kerosene Vale Stockpile Area in 2012. The ESA comprised of:

- The drilling of thirteen (13) bore holes;
- The installation, development and sampling of three groundwater monitoring wells;
- Sediment sampling and laboratory analysis of select soil, sediment and;
- Groundwater samples to evaluate concentrations of the contaminants of potential concern (CoPC) associated with historical land use activities.

Key findings of the Phase 2 ESA for the Kerosene Vale Stockpile Area were the detection of Amosite asbestos fibres in a surface soil sample collected from the central portion of the Site and concentrations of dissolved metals (including one or more of arsenic, nickel and zinc) exceeded the adopted groundwater assessment criteria (GAC) in samples collected from the groundwater monitoring wells. Based on the Site inspections and sampling and analysis conducted, the extent of asbestos impact remains unknown.

Since then Springvale Coal has implemented interim management practices to reduce the potential risk of the asbestos containing material. These management practices include the following:

- Limiting access to the area for heavy machinery;
- Maintaining vegetative cover;
- Maintaining sediment and erosion controls; and
- Erecting clearly labelled signs.

9.5.14.3 Future Assessment

The Phase 1 ESA for the Springvale Coal Services Site recommends that a Phase 2 ESA should be conducted to target areas of potential contamination, where the risk is moderate. It is understood that a number of areas of potential contamination are overlain by sediment ponds and stockpiles of overburden.

On 2 February 2012 Springvale Coal provided a schedule to the NSW EPA that states that the works for low risk sites will be conducted by February 2015.

The Phase 2 ESA program will target areas of potential contamination that are accessible and assess the potential for off-site migration. The Phase 2 ESA will be conducted during construction and in accordance with the above mentioned schedule provided to the NSW EPA, which states that the works

In relation to the Kerosene Vale Stockpile Area, Springvale Coal is developing appropriate remedial/management options for asbestos containing material. The management options being considered are:

- In-situ site remediation involving placement of geo-textile barrier/ vegetation cover/hardstand over the impacted areas and development and implementation of an ongoing site management plan (OSMP); or
- Physical treatment, such as hand picking, tilling, and screening of asbestos material. Any asbestos fibres and asbestos containing material will have to be consolidated, properly packaged and disposed at a NSW EPA approved licensed landfill.

9.5.14.4 Conclusion

The Phase 1 ESA concludes that past and current use of the Springvale Coal Services Site is likely to have resulted in potential soil, sediment and surface water contamination, and potentially groundwater impact in some areas of the Site. However, no significant contamination was identified during site inspections. A Phase 2 Investigation of the Springvale Coal Services Site will be conducted during construction and before February 2015 in accordance with Springvale Coal's stated commitments to the NSW EPA.

Management options for asbestos containing material within the Kerosene Vale Stockpile Area are being prepared by Springvale Coal and will be implemented before February 2015 in accordance with Springvale Coal's stated commitments to the NSW EPA.

9.5.15 Hazards

9.5.15.1 Introduction

Operations at the Springvale Coal Services Site are carried out in accordance with relevant health and safety legislation and will continue to do so during the construction and operation of the Project. Key potential hazards associated with the Project are addressed below.

Potential hazards associated with the Project during construction include:

- Bushfire;
- Unauthorised access and risk of damage and/or injury;
- Spills of hazardous materials during storage, handling and transportation; and
- Traffic.

9.5.15.2 Bushfire

Parts of the Springvale Coal Services Site are identified as being within bushfire zones in the Lithgow LEP.

Springvale Coal Services Site currently operates with an existing Bushfire Management Plan. This plan identifies the critical assets being the Washery, coal handling infrastructure and the overland conveyor. The main Washery and processing area has sufficient firebreak, while the majority of the overland conveyor passes through cleared agricultural land. Sections of the overland conveyor also pass through the State Forest and an Asset Protection Zone has been established and maintained. This firebreak is regularly inspected and maintenance carried out as required.

Fire extinguishers are positioned at the crusher, generators, offices and workshop areas. All fire extinguishers meet the requirements of AS 1841–2007 and AS 1851–2005, and are appropriately signed posted. A fire officer has been appointed for the site and all fire fighting equipment is maintained and inspected regularly. The main water storages on site, DML Dam, Cooks Dam and the existing Conveyor Dam are available to assist the Rural Fire Service as required while the main Washery water storage tank can be used to fight on site fires in and around the Washery and coal storage areas.

Flammable substances such as fuel and oil would be used on site. Therefore, there is potential for ignition of these substances during construction and safety implications associated with bushfire risk for staff and local residents.

The Springvale Coal Services Site operates with an existing Bushfire Management Plan. Mitigation includes the continued operation of this Plan and Site safety protocols, incident management and emergency procedures, including those to manage bushfire risk in accordance with Planning for Bushfire Protection (RFS 2006). Other mitigation measures include the preparation of emergency protocols and a water source being available for fire fighting.

The largest risk comes from bushfires emanating from the Ben Bullen State Forest. This forest is managed by the State Forest NSW. Firebreaks have been established along the overland conveyor where it passes through forested land. These areas are maintained by the Springvale Coal Services operation. The main assets on site are adequately protected by existing cleared land. The Project does not involve any new disturbance to the Ben Bullen State Forest. Existing asset protection zones will be maintained but not extended. The Project also does not involve removing any existing access to the State Forest or otherwise restrict the management of the forest by Forests NSW.

9.5.15.3 Unauthorised access

Existing security arrangements at Springvale Coal Services Site comprise fencing along the main road frontage with locked gates and internal fencing separating the main access road from other internal access roads. The car park is separately fenced with a locked gate for vehicle access. Pedestrian access to the main office is provided for visitors, while vehicles require access through the locked gate – which can be provided with prior approval and appropriate inductions. All visitors are required to sign in and report to the main office. Inductions are required for access to all areas outside the main office. Signs are displayed throughout the site and at the front entrance. The site is also subject to regular security patrols.

During construction all sites will have appropriate security provisions such as fencing and signage to warn of the risks associated with unauthorised access.

9.5.15.4 Hazardous materials

Hazardous materials currently used at the Springvale Coal Services Site are managed under a Hazardous Substances Management Plan. These materials are either stored in the workshop or at the Washery and include:

- One (1) 10,000 litre flocculant tank and three (3) 1,000 litre tanks. Deliveries of flocculant are made once per month with a monthly usage of generally less than 5,000 litres;
- 200 litres of oil (gearbox, engine, hydraulic) stored in 20 litre drums within the Workshop. Deliveries of oil are made approximately once per month;
- 2 oxy-acetylene welding sets (size H weighing 88kg) with 4 sets used per year; and
- General workshop supplies include cleaning rags, solvents, grease, hand cleaner and detergents. Quantities stored are generally less than 10 litres and replaced as require;

There are no diesel storage tanks on site at present with mobile plant refuelled by mobile tankers as required. As noted below, during construction a self-bunded diesel tank will be used which may stay as part of the ongoing operation.

The flocculant used at the Springvale Coal Services Site is Nalco Liquid anionic 82220 which is classed as non-hazardous but can cause mild skin irritation with prolonged exposure. The material is non-flammable, non-carcinogenic and is safe to use in the environment for flocculating sediments from farm dams.

During construction the following materials will be brought onto the site and temporarily stored:

- Diesel, stored in a self-bunded tank which complies with AS1940–2004 (Storage and handling of flammable and combustible liquids) and AS1692–2006 (Steel tanks for flammable and combustible liquids). Approximately 20,000 L will be stored;
- Oxy-Acetylene tanks which are a Class 2 Dangerous Good and which will be used for steel work on site;
- Minor quantities of cement in bags with the majority being brought onto site in a ready-mixed form; and
- Minor quantities of oils, solvents, hydraulic fluid and cleaning products.

Once operational, the Springvale Coal Services Site would operate in a similar fashion as present. The use of flocculant will increase according to production and should peak at around 15,000 litres per month. The site itself will not use significantly larger quantities of fuel or contract truck operators.

Hazardous materials used during construction and operation of the Project will be managed under the Hazardous Substance Management. Storage, handling and transportation of materials will be in accordance with relevant Australian standards and legislation.

9.5.15.5 Traffic

Existing traffic movements are identified in Section 9.5.10 and the Traffic Impact Assessment in **Appendix 12.** Vehicle access is only provided to the main car park. No vehicles can access the site without prior approval, appropriate inductions and use of approved and compliant vehicles.

A slight increase in both light and heavy vehicles entering and exiting the Springvale Coal Services Site is expected during the construction phase of the proposed infrastructure within the site and such an impact will be managed through the implementation of a Construction Traffic Management Plan.

Once fully operationally the Project is unlikely to result in increased traffic incidents. Safety issues associated with traffic using the proposed Link Haul Road, existing Haul Roads and internal road network will continue to be managed by Springvale Coal Services Site under existing safety systems. These systems cover contractor behaviour, speed, destination and general use of the private road network.

9.5.15.6 Conclusion

Springvale Coal Services Site is implementing a variety of hazard management plans and systems which have been effective in mitigating any potential associated risk at the Site. As the Project will not generate any further hazardous materials and existing infrastructure will be utilised, the mitigation measures suggested will be appropriate.

9.5.16 Waste

Springvale Coal's overall objectives are to achieve waste minimisation through maximising re-use and recycling strategies, to ensure environmentally responsible disposal of waste materials not suitable for re-use

or recycling, and to ensure environmental protection throughout all stages of waste handling, storage, collection and disposal.

There are four main forms of waste generated by the Western Coal Services Project and in particular the Springvale Coal Services Site. These include:

- Coal reject material produced from the Washery;
- Recyclable materials;
- Workshop wastes; and
- Domestic wastes.

The production, emplacement and rehabilitation of coal reject material is described in Section 5 of the EIS, while details of the remaining categories are described below.

With the completion of the Lamberts Gully Open Cut Mine, the diesel and waste oil tanks associated with this contractor operation have been removed from site. There is only minor maintenance of on-site equipment undertaken at the Springvale Coal Services Site. The workshop generates minor quantities of waste oil, oily rags, filters, oily water and general workshop materials. In recent years, the average usage of oil is around 125 litres per month but varies according to maintenance schedules. All waste oil is recycled. In addition to waste oil, the volume of workshop wastes produced is in the order of 1 ton per year while approximately 7 tonnes per year of general wastes are produced by the operation. Total volume of wastes sent for recycling is currently around 3 tonnes per year excluding waste oil at around 1,500 litres per year and metal.

Centennial Coal has a company-wide waste collection and recycling service provider including recyclables, workshop materials and general office wastes. Oil drums and filters (after rinsing and crushing) are disposed of with waste metals through metal recyclers. Aluminium cans are a separate stream, which is sold to metal recyclers. Waste oil (and oily water) is disposed of by licensed waste transporters and recyclers, or at treatment plants. Oily rags, filters, oily water and general workshop wastes are separated for collection by the licensed waste contractor. Remaining waste is removed from site by a licensed waste contractor.

Waste paper and cardboard is separated and collected for recycling as required. Regular waste management inspections are completed by the waste contractor.

9.5.16.1 Construction and Operational Waste

Potential construction waste will include steel, timber, glass and waste oils. Approximately 600 litres of waste oil (engine and gearbox) oil will be produced monthly while approximately 4 tonnes of recyclable materials will be generated per month. There will be an additional 2 to 5 tonnes per month of non-recycable wastes generated during the construction phase. All waste generated during the course of the works will be reused or removed from the work areas at regular intervals (generally weekly) by a suitably qualified contractor and disposed of as required at an approved waste facility. A separate construction compound will be erected that would include minor servicing of equipment and machinery on site. Prior to the commencement of construction, a CEMP will be prepared and will include actions for the:

- Separation of recyclable materials for removal by licensed contractor;
- Collection of all rubbish and perishables for disposal in a licensed landfill; and
- Collection of all waste oils and oily water for removal and disposal by a licensed waste contractor.

Waste is to be removed at regular intervals by a suitably licensed contractor and disposed of as required at an approved waste facility. Waste containers will include front lift, skip, and roll-on roll-off bins depending on location requirements. The handling, storage and transport of hazardous materials and waste will be in

accordance with the National Code of Practice and the relevant Material Safety Data Sheet (MSDS) on the product.

Hazardous wastes will be stored in the dedicated waste container in the site compound and removed as required by a licensed waste contractor to an approved waste facility.

Waste will be stored in an environmentally responsible manner, avoiding any sites adjacent to potentially sensitive areas such as natural vegetation, stormwater drains or waterways. Waste will not be stored, or come into contact with, any incompatible waste type (e.g. contaminated material not to be mixed with uncontaminated material).

Storage of waste oils and chemicals is to be in the purpose built secured, bunded area. The capacity of the bunded area is to be at least 120% of the chemical stored within. An emergency response spill kit is to be located adjacent to the bunded area.

Records will be retained detailing the quantity and classification of waste material removed from the site.

The ongoing operation will be similar to the current operation once the construction program is complete. Operational wastes, such as general waste, waste fluids and waste containers, will be managed as part of the Springvale Coal Services Site current procedures. However, there would be additional tailings and coarse reject produced during operation as a result of the Project. The estimated quantity and management of this waste is identified in **Table 63** and is discussed further in Section 5 of this EIS.

Table 63 Operation Waste and Management Measures

Operational Waste	Estimate of Quantity	Management Measures
Tailings and coarse reject	1 Mtpa	To be managed in accordance with the tailings and coarse reject disposal strategy.
Waste Oil	1,500 litres pa	Recycled in accordance with current Waste Management Plan
Paper, Cardboard, packaging	3 tpa	Recycled in accordance with current Waste Management Plan
Metals	2 tpa	Recycled in accordance with current Waste Management Plan
Other recyclables (glass, plastics)	1 tpa	Recycled in accordance with current Waste Management Plan
Chep Pallets	Nil	Returned to supplier
Oily water, filters, workshop waste	1 tpa	Collected by licensed waste contractor for further recycling, recovery and final disposed at Licensed land fill site
General Wastes	7 tpa	Collected by licensed waste contractor for disposed at Licensed land fill site

9.5.16.2 Ongoing waste management

The waste management strategies for all Springvale Coal operations include the principles of avoidance, reduction, reuse, recycle and disposal. Effective long term waste management at the Springvale Coal Services Site involves the following waste management initiatives:

- Monitoring performance and reporting;
- Setting annual targets for waste reduction initiatives;
- Ongoing review waste generating processes;
- Ongoing review waste management processes;

- Assignment of responsibilities;
- Training; and
- Provision of effective and appropriately located waste and recycling facilities.

An internal review process is carried out regularly to monitor and continually improve waste management procedures. As the quantity and composition of the waste stream changes over time, the continual monitoring of waste generation will assist in determining any changes required to the management process. Centennial Coal has a group contract with a waste management contractor who provide a comprehensive waste recycling and disposal service. The contractor provides separate bins for paper and cardboard, oily rags, filters, expired chemicals, plastics etc depending on the needs of individual sites within the Centennial Group. The contractor investigates the needs of each operation and develops a program to maximise recycling.

9.6 Cumulative Effects

This section identifies the potential cumulative effects of the Project, together with existing and approved mining operations and other activities in the area. Existing and approved mining operations and other activities in the area that have been considered include:

- **Lidsdale Siding Upgrade Project.** This Project involves an upgrade to the existing Lidsdale Siding rail loading facility to improve its operational efficiency and increase its throughput capacity to approximately 6.3 Mt per annum. The Project is currently before the Planning and Assessment Commission;
- Mt Piper Power Station including:
- Application for a Western Rail Coal Unloader (06_0271) approved in June 2009;
- Application for a new Base Load Power Station (MP 09_0119) approved in January 2010; and
- Application for the Ash Emplacement Project under part 3A (MP 09_0186) approved in February 2012.
- Delta Electricity received approval in June 2009 to construct a rail coal unloader facility north of Mt Piper and Wallerawang Power Stations, near Lithgow. The proposed facilities include a rail loop, connecting to the Mudgee rail line branch, a rail unloader and a conveyor to transport the coal to the power station;
- **Angus Place Colliery**. Angus Place Colliery is an existing underground longwall mining operation located in the NSW Western Coalfield, approximately 120 km west-northwest of Sydney. In 2010, Angus Place Colliery sought to modify its existing NSW Part 3A Project Approval, under Section 75 W of the EP&A Act, which included the addition of two longwall panels, 910 (Options 1 and 2) and 900 W. Angus Place Colliery also referred this Project to the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC). Approval under the NSW EP&A Act for the two longwalls was granted on 29 August 2011;
- **Springvale Coal Mine**. Springvale Coal Mine is an existing underground longwall mining operation. In 1992, Springvale Coal obtained Development Consent to produce up to 3.4 Mt per annum (Mtpa) of ROM coal, and longwall mining commenced in 1995. Springvale Coal was required to obtain an approved Subsidence Management Plan (SMP) in place prior to the commencement of mining. In 2006, Springvale Coal obtained SMP Approval to extract LWs 411 to 418. Springvale Coal has now sought to obtain approval under the EPBC Act for the proposed LW's 415 to 417. LW's 415 to 417 are located beneath the Newnes State Forest north of Lithgow. Two further modifications to Project Approval 06_0021 have been approved for two additional longwall panels, increased tonnage and Ventilation Facility; and
- **Pine Dale Coal Mine**. A Part 3A application (10_0041) for an open cut mining extension to the Pine Dale Coal Mine (Yarraboldy Extension); Pine Dale Coal Mine Stage 2 Extension Project aims to extend the original Pine Dale Coal Mine (approximately 82ha) and Yarraboldy Extension Area (approximately 27ha) by approximately 210ha. The components of the Project include:

- Crushing, stockpiling and maintenance area;
- Office, amenities and parking area;
- Railway line, spur and rail load-out area;
- Internal access roads and private haul road crossing; and
- Explosive magazine and/or reload area.

Depending on the timing of assessment/Project approval, construction of the Project could potentially occur in parallel with other local or regional developments that are identified within this section of the EIS. This presents the possibility for a cumulative impact whereby the potential for impacts associated with individual Projects could have a collective affect on particular areas or sections of the community.

Additional developments in the area which may contribute to the cumulative impact of the Project include:

- Wallerawang Power Station, including approval for a DA (024/11DA) in July 2011 for new storage silos;
- Blackmans Flat Waste Management Facility; and
- Western Matrix Mobile Resource Recovery Mill (011/11DA).

Due to uncertainty associated with the potential impacts of other proposed Projects and activities, this assessment provides a broad indication of the potential cumulative effects.

Cumulative effects of key environmental impacts are outlined below.

9.6.1 Noise

Potential sources of noise surrounding the Project have been identified as the Wallerawang Power Station, the Mt Piper Power Station, the Angus Place Colliery, the Angus Place to Mt Piper Haul Road, the Springvale Coal Mine, the Angus Place to Wallerawang Haul Road, Blackmans Flat Waste Management Facility and Pine Dale Coal Mine.

It is noted that, for each of the developments assessed, the likelihood of the existing, approved future developments, as well as the Project simultaneously emitting maximum noise emissions is remote, due to the range of development locations and differences in the noise enhancing weather effects. The cumulative assessment conducted is considered to be conservative.

Predicted cumulative amenity noise levels from existing, approved and proposed mining and industrial noise sources, and the Project are at, or below, the relevant acceptable amenity levels for suburban receivers at all locations during the daytime and evening period. During the night period, the cumulative amenity noise level exceeds the acceptable level of 40 dBA at Locations B2 and B17 as identified in **Figure 23**, but remains below the maximum noise level of 45 dBA.

9.6.2 Air Quality

The Air Quality Impact Assessment assessed the cumulative air quality impacts of the Project using a statistical approach known as the Monte Carlo Simulation.

The Monte Carlo Simulation is a statistical approach that combines the frequency distribution of one data set (in this case, background 24-hour average PM_{10} concentrations) with the frequency distribution of another data set (modelled impacts at a given receptor). This is achieved by repeatedly randomly sampling and combining values within the two data sets to create a third, ‘cumulative’ data set and associated frequency distribution.

Receptors (residence numbers) B2, B8, WR1 and WR2 were chosen to represent the most affected private residences. PM_{10} data from the Angus Place HVAS monitor was used to represent possible background values in the area. Individual 24-hour average predictions for the proposed modification are added to a random value from the above data sets. This process is repeated many thousands of times yielding the 'cumulative' data set, which is then presented as a frequency distribution.

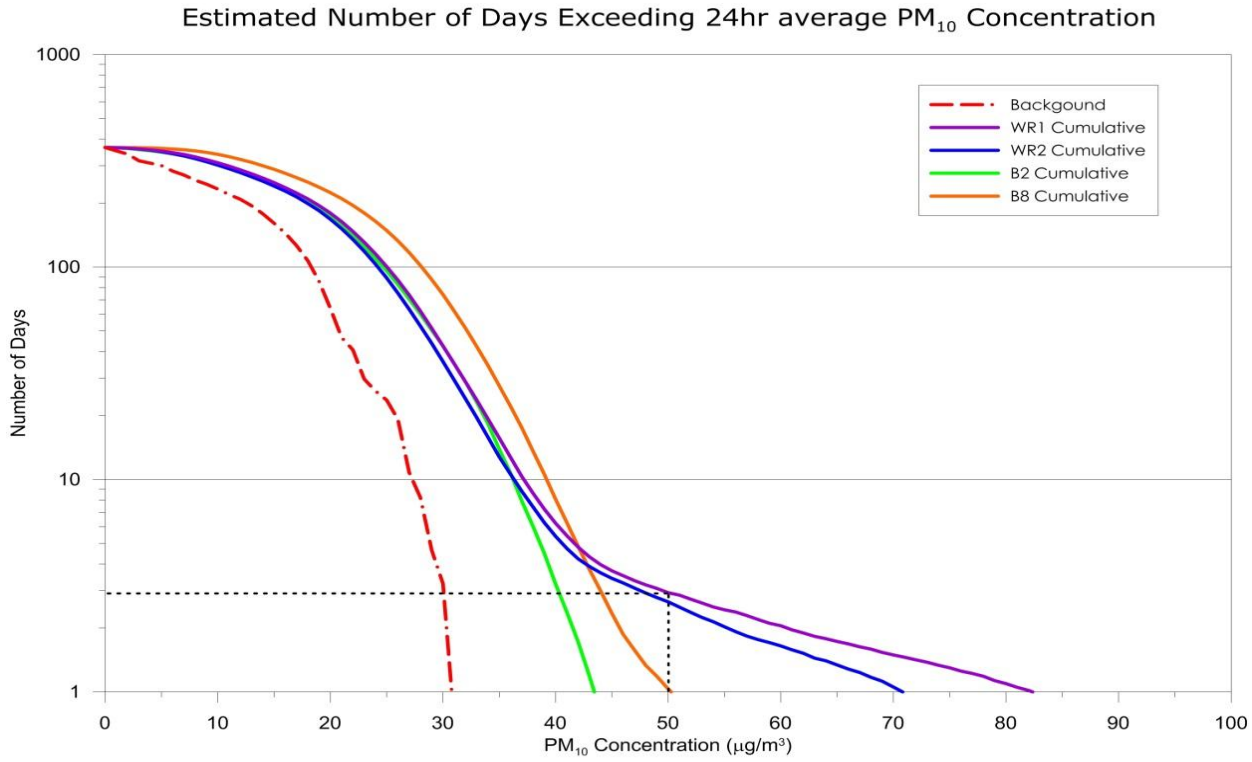
The process assumes that a randomly selected background value would have a chance equal to that of any other background value from the data set of occurring on the given 'modelled day'. Over sufficient repetitions, this yields a good statistical estimate of the combined and independent effects of varying background and Project contributions to total PM_{10}.

To generate greater confidence in the statistical robustness of the results, the Monte Carlo Simulation was repeated 250,000 times for each of the two receptors. In other words, the same 1-year set of predicted (modelled) 24-hour average PM_{10} concentrations were added to 250,000 variations of the randomly selected background concentrations (a different random background concentration is selected each time).

The results of the Monte Carlo simulation are presented graphically in **Figure 47**. The plot shows the statistically estimated number of days that 24-hour average PM_{10} concentrations might exceed a certain concentration and also compares the cumulative probability with the measured background. From this analysis the 50 µg/m^3 criterion is estimated to be exceeded at Blackmans Flat for 1 day (or less) per year, or less than 0.3% of the time.

Residences at Wolgan Road are predicted to exceed 50 µg/m^3 on approximately 3 days per year, or less than 0.9% of the year. Model predictions for these two residences indicated two exceedances of 50 µg/m^3 without additional background included. The Monte Carlo analysis shows that there is only likely to be one additional exceedance when background is added.

Figure 47 Statistical estimate of number of days exceeding 24-hr PM_{10} average concentrations following Monte Carlo simulation



9.6.3 Surface Water

A review of existing and approved projects in the area that could potentially generate a cumulative impact on surface water has been undertaken as part of the Surface Water Impact Assessment. A summary of the significant projects, their potential impact, mitigation measures and residual consequences is provided in **Table 64.**

Given the numerous industrial operations in the vicinity of the Springvale Coal Services Site, the cumulative environmental impacts need to be taken into consideration when assessing the potential for catchment scale disturbances. Due to the location of the Project, there is the potential for subsequent effects to downstream users. Therefore, a catchment scale assessment is required to ensure minimal environmental disturbances and to estimate potential impacts.

Improved water quality being discharged from the Springvale Coal Services Site as well as a reduction in the volume of process water discharged will occur as a result of the Project. This will result in an overall improvement in water quality and aquatic habitat condition for aquatic biota in the length of Wangcol Creek that is adjacent to the Springvale Coal Services Site.

Impacts from flooding as a result of surrounding industries are proposed to be managed by diverting clean water runoff from external catchments (undisturbed land in the Ben Bullen State Forest), away from the disturbed areas. The design of these diversion drains would be such that 100 year ARI flood event could be conveyed from the external catchments into these areas. The concentration of flood flows, increased water levels upstream, redirected water across the floodplains, and increased flood velocities were all considered potential consequences of cumulative activity in the area.

9.6.4 Groundwater

The surrounding industry upstream of the Springvale Coal Services Site, including the Mt Piper Power Station, may be affecting the groundwater in the Lithgow Seam, as currently constructed dams and ash emplacement areas are located in the surficial aquifer. Therefore, any potential leakage from the ash emplacement areas and dams may affect groundwater quality and flows down gradient.

It is predicted that 7.7 m^3/day of water will enter the Springvale Coal Services Site dams by the end of the operational period as a result of the Project. This is considered very small when compared to the flow in the Wangcol Creek and overall site water balance. No measurable drawdown is predicted as a result of the Project. In addition, the water from the DML and Cooks Dams, located on the Springvale Coal Services Site, is being used on site for operational purposes and any leakage flows below the creek bed.

Improved understanding of groundwater conditions including a better understanding of the groundwater movement between Wangcol Creek and the Springvale Coal Services Site will occur as a result of the Project.

Table 64 Surface Water Cumulative Effects Summary

Project Description	Potential Environmental Effect	Mitigation Measure
Lake Wallace (LCC, May 2011a and DE, 2008) An impoundment of the Coxs River located within the Sydney Drinking Water Catchment.	▪ Variations in water quantity and changes to environmental flows in the Coxs River.	▪ Water is released to accommodate environmental flows during normal operations and as part of the Drought Management Plan. The frequency of controlled discharges will be managed (following sustained periods of high rainfall) in order to prevent the back-up of floodwater in the Upper Coxs River Catchment.
Wallerawang Power Station (Dixone,E, April 2008) Water that is used in the power stations cooling system is primarily drawn from Lake Wallace and during dry periods from Lake Lyall.	▪ Increases in environmental flows. ▪ Erosion and sediment control.	▪ Management strategy to reduce salt/pollutant loading. ▪ An ongoing routine water quality monitoring program (Cardno Ecology Lab, 2010). ▪ Installation of erosion and sediment control measures to treat runoff from capped areas until vegetative cover is established. ▪ The collection pond provides primary treatment of water through sediment removal. ▪ The need for water uptake from the Coxs River by Wallerawang Power Station has been reduced as a result of a mine water transfer system which provides benefits to the Coxs River catchment.
Mount Piper Power Station Ash Dam Emplacement (SKM, 2010) Proposed ash placement sites at Lamberts North and Lamberts South.	▪ Surface water hydrology and water availability has the potential to be altered in the Upper Coxs River/Wangcol Creek in the form of a reduction in runoff volume as a result of reduced catchment area and the need for additional external water sources to supply the demand. ▪ Water quality in Wangcol Creek may be affected by releases of water from the proposed ash placement site.	▪ The installation of diversion drains. ▪ Excess runoff would be captured and retained for site rehabilitation and dust suppression. ▪ Diversion drains would be employed for the purpose of managing clean water runoff from external undisturbed catchments to the disturbed areas. The design of these diversion drains would be so that 100 year ARI flood event could be conveyed from the external catchments. ▪ Western Coal Services new REA lies on the same land as the proposed Lamberts South Ash Emplacement. Using this site for Ash or coal reject does not result in different impacts.
Mt Piper Power Station Extension (SKM, 2009) An application for a new Base Load Power Station was approved in January 2010. The existing power station is situated in the upper catchment of the western arm of Wangcol Creek.	▪ A holding pond which contains an underflow weir drains water from the site to Wangcol Creek. ▪ Licenced discharge to receiving waters.	▪ The need for water uptake from the Coxs River by Wallerawang Power Station has been reduced as a result of a mine water transfer system. ▪ An independent water treatment system would be implemented as part of the extension. ▪ Brine used in the treatment process is stored in holding ponds, and is concurrently used to condition fly ash. ▪ Mine water exchange would ensure no additional drawing from the surrounding waterways. Water quality of the surrounding catchments was projected to be assured by the ongoing policy of ‘zero discharge’.

Project Description	Potential Environmental Effect	Mitigation Measure
Angus Place Colliery (Aurecon, 2010) An EA for a proposed modification of the existing PA for two new longwall panels (910 and 900W), increasing annual coal production from 3.5 Mtpa to 4Mtpa.	▪ Changes to flow regimes and surface flow contributions to the hanging swamp environments identified around the area. ▪ The cracking of dry creek beds causes instability or loss of flows.	▪ A clean water diversion channel is present along the lower reaches of the East Wolgan Swamp. ▪ Improvements to the existing water management plan will be identified as part of the modification process. Any potential minor changes to surface flow will be assessed as part of these modifications. ▪ Surface monitoring lines should be installed at relevant locations to provide accurate measurements of subsidence, creek bed cracking and stability.
Blackmans Flat Waste Management Facility (Geolyse, 2006) The DA for this facility was approved in 2006. The proposed site (preparation of an existing mine void) for the landfill is up gradient of the coal services site straddling the northern boundary of the coal services site.	▪ Leachate and stormwater containment and management. ▪ Overflow prevention. ▪ Waste water and effluent management with discharges into the DML Dam.	▪ The installation of an on-site wastewater and effluent management system integrated with the proposed design. ▪ The management of leachate would involve capture, containment and if necessary offsite disposal at a licensed treatment facility. ▪ The prevention of overflow was planned for in the design and management of the storage system, which included containment of a 25 year ARI 24 hour storm event ▪ The DML Dam was projected to be the main discharge point for surface waters, with a clear intention on diversion away from the landfill areas. Monitoring of the DML Dam will be required in order that its suitability to receive surface water discharge is maintained.
Springvale Mine (Centennial Coal, 2010) Development of longwalls 415 to 417 at Springvale Mine. Increasing the coal annual production from 3.4 Mtpa to 4.5Mtpa.	▪ Longwalls 415, 416 and 417 lie beneath areas of EEC known as 'Temperate Highland Peat Swamps on Sandstone' THPSS known as Sunnyside Swamp. ▪ The proposed longwall mining will result in some surface subsidence. Monitoring of surface water flows during existing longwall advancement detected no impact to the swamp environment.	▪ The Springvale Delta Water Scheme was established between Centennial Springvale and Delta Electricity to improve the management of water at the Springvale Colliery and to reduce the extraction of water by Delta Electricity from the Coxs River supplies. The scheme operates under two scenarios, normal and abnormal. Under normal circumstances all water is transferred to Wallerawang Power Station. Under abnormal/emergency circumstances water is discharged through LDP006. ▪ Monitoring of surface water flows during existing longwall advancement detected no impact to the swamp environment.
Mobile Resource Recovery Mill (Advitech, 2011) DA for the trial of a mobile resource recovery mill (MRRM) at Blackmans Flat. Proposed to conduct a six month trial to produce up to 29,000t of road base.	▪ Small amounts of waste water from the production of road base would contain fly ash and coal Washery reject fines.	▪ The proposed trial has no waterways adjoining it. ▪ The storage of water on the proposed site was proposed to occur in a 4,000L tank adjacent to the mill. ▪ All diesel held on site was proposed to be stored in a diesel drum on a plastic spill pallet to minimise the potential of spills. ▪ Any waste water produced from the trial would not contain any toxic or hazardous materials and would be deposited on the ground.

Project Description	Potential Environmental Effect	Mitigation Measure
Western Rail Coal Unloader (SKM, 2007) Approved in June 2009 for the construction and operation of a rail balloon loop and coal unloading facility. The rail loop is located in the floodplains of Pipers Flat Creek, crossing the creek twice. Once on the northern side and once on the eastern side of the loop.	▪ Construction of the rail loop has the potential to act as an obstruction to flood flows of the Pipers Flat Creek with the potential for these flows to back up behind embankments. ▪ The construction of embankment structures will concentrate flood flows, leading to increases in water levels upstream. This may result in the redirection of water across the floodplains and increase overall flood velocities.	▪ Creek channel augmentation. ▪ Creek flow regulation. ▪ Channel diversion and management.
Pine Dale Coal Mine (Aquaterra, 2010) Part 3A application for an open cut mining extension (Yarraboldy Extension) approved in February 2011.	▪ Alterations to existing surface water flows. ▪ Periodic clean water discharges.	▪ Surface water inflow is managed as follows; ▪ Clean water is diverted around the mining areas; ▪ Surface water inflow is directed to the in-pit sump; and ▪ Water is retained within the sump for as long a period as possible to allow settlement of suspended particles.

9.6.5 Social

Conventional measures to reduce the impacts (noise, visual, dust) will not address the cumulative impacts that have occurred over many years for the main residential area of Blackmans Flat. Lithgow Council's Land Use Strategy acknowledges this and has identified that the future zoning of Blackmans Flat will need to recognise the dominant land use – which is heavy industry, therefore removing opportunities to protect residential amenity. A strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents has been developed by Springvale Coal. Springvale Coal has written agreements with seven (7) of the nine (9) residents within the Blackmans Flat residential area. Springvale Coal is continuing to negotiate with the remaining 2 residents within the Blackmans Flat residential area. Regardless, the impact assessments in the EIS have taken into consideration all privately owned residences in the Blackmans Flat residential area. The Strategy will allow for the Project to be developed to its full potential and positively contribute to the long term viability of the industry in the region.

9.6.6 Terrestrial Ecology

There are potential cumulative impacts upon those ecological values that may also be incrementally impacted upon within the PAA. Springvale Coal Services Site is situated at the northern edge of a large area of intact native vegetation associated with Ben Bullen State Forest. Those ecological entities, including the threatened species recorded within the Springvale Coal Services Site, are likely to be well represented within the neighbouring forested areas.

Pine Dale Coal Mine Stage 2 Extension Project aims to extend the original Pine Dale Coal Mine (approximately 82ha) and Yarraboldy Extension Area (approximately 27ha) by approximately 210ha.

Approximately 210 ha of state forest vegetation is required to be removed for this project, comprising three vegetation types, namely:

- Stringybark (*Eucalyptus sparsifolia, E. macrorhyncha*) – Scribbly Gum (*E. rossii*) Forest;
- Rocky Outcrop Complex;
- Mountain Gum (*Eucalyptus dalrympleana*) Forest; and
- Open Cleared Lowlands.

Survey work has identified the NSW listed Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South eastern Slopes Bioregions EEC is present with the Stage 2 Extension Area. In addition, one threatened flora species, namely *T. australe* has been recorded within the Stage 2 Extension Area. *T. australe* is listed as Vulnerable under the TSC Act and EPBC Act. A total of 99 individual of *T. australe* plants from 26 survey plots were recorded by Eco Logical Australia. The Stage 1 extension area was modified to retain the recorded *T. australe* population, however Stage 2 has sought to provide a provisional exclusion area to provide for the development of an offset strategy targeting this species (R.W. Corkery & Co., 2011). There is therefore potential for this local population to be impacted upon if appropriate offsets cannot be found.

In addition, despite the threatened *Eucalyptus cannonii* being previously considered to have no likelihood of occurrence within the Pine Dale Stage 2 Extension Area (Enhance Place 2012), considerations of the vegetation communities located within the extension area and the records for this species within the locality suggests that there is a high likelihood that this species occurs. *E. cannonii* is listed as Vulnerable under the TSC Act and EPBC Act. The likelihood of the species occurring within the Stage 2 Extension Area suggests that there is potential for a local population to be impacted upon if the species is omitted from mitigation and/or offset considerations for this proposal. Given that the Western Coal Services Project will also impact

upon areas known or likely to contain *E. cannonii* individuals, there is potential for cumulative impacts to occur upon this species.

Pine Dale Coal Mine Stage 2 Extension Project will remove habitat for a number of threatened fauna. In particular it is recognised as habitat for listed forest and woodland birds, with Scarlet Robin and Gang-gang Cockatoo being recorded within the Stage 1 area (Ecotone Ecological Consultants, 2010) and Scarlet Robin, Varied Sitella and White-bellied Eagle being recorded during surveys for the Stage 2 area (R.W. Corkery & Co., 2011). The site of the Pine Dale Coal Mine Stage 2 Extension Project also provides habitat for Squirrel Glider, which was potentially recorded, however the sighting could not be confidently identified as this species by Ecotone Ecological Consultants. In addition, the site provides habitat for microchiropteran bat species, with three threatened bat species being potentially recorded with a 'probable' or 'possible' level of confidence, namely Eastern Bent-wing Bat, Eastern Cave Bat, Large-eared Pied Bat and Yellow-bellied Sheath-tailed Bat (Ecotone Ecological Consultants, 2010). Habitat also exists within the extension areas for other locally occurring threatened fauna species such as the Regent Honeyeater and Spotted-tailed Quoll (Enhance Place 2012).

The Bathurst Copper Butterfly was recorded in several patches of its larval food plant, *Bursaria spinosa* subsp. *lasiophylla*, both within and adjacent to the Pine Dale Coal Mine Stage 2 Extension Project area during surveys by Ecotone Ecological Consultants in 2009, 2010 and 2012. The Pine Dale Coal Mine Stage 2 Extension Project would directly impact upon 1.55ha of known Bathurst Copper Butterfly habitat, within which a total of 36 individual butterflies have been identified during surveys (Enhance Place 2012).

Cumulative impacts from the Pine Dale Coal Mine Stage 2 Extension Project and Western Coal Services Project would primarily occur upon those fauna species potentially utilising the woodland habitats proposed to be removed by both projects. This would include the threatened species listed above, with the exception of the Bathurst Copper Butterfly, which was determined to have limited potential to exist on the Western Coal Services site given a lack of *Bursaria spinosa* subsp. *lasiophylla* patches. A total of approximately 251 ha of woodland habitat will be impacted upon by the combined proposals, however both projects are surrounded by large, forested areas within the Ben Bullen State Forest that provide commensurate habitat, enabling the persistence of local populations of threatened fauna species subjected to these cumulative impacts, including woodland birds and arboreal mammals, whilst providing potential habitat for threatened flora species including *Eucalyptus cannonii*. Additionally, the Pine Dale Coal Mine Stage 2 Extension Project proposes that biodiversity offset would be implemented in order to meet or improve principles for biodiversity values. Given that potential habitat for threatened species potentially subjected to cumulative impacts will be retained within adjacent areas and provided that offsets implemented for the Pine Dale Coal Mine Stage 2 Extension serve to maintain the biodiversity values of the area, the cumulative impacts of these proposed projects are considered to constitute low impacts to threatened species, known or potentially occurring within these respective sites.

Therefore, whilst the Project is likely to contribute to the accumulation of impacts known to be occurring within the locality of the PAA, its contribution would not be to such an extent that it would significantly impact upon the local populations of those threatened species or ecological communities known, or expected, to occur in the locality.

9.6.7 Aquatic Ecology

There are a number of projects approved or underway within the overall Huon and Lambert Gully sub-catchments that drain to Wangcol Creek. Strategies within these projects are expected to be managed with the intention to further improve the control of site processed waters, as well as to improve the diversion of clean stormwater to Wangcol Creek. The approved Pine Dale mining operation includes similar provisions for controlling site water runoff and diversion of stormwater around the site. In summary, the assessment of existing and approved projects in the locality indicates that there will be no adverse cumulative effects to the

aquatic ecology of Wangcol Creek or Coxs River. In fact, proposed improvements to site water management associated with the various projects, including this Project, should have the effect of an overall improvement for Wangcol Creek aquatic biodiversity.

9.6.8 Visual Impact

The majority of elements proposed by the Project will not contribute to cumulative visual impacts to the catchment due to the location of the proposed elements and the factors such as topography and vegetation interrupting views to and across the site. The existing Pine Dale mine site, including the existing and potentially expanded overburden emplacement bund on the northern side of the Castlereagh Highway, and the Mt Piper Power Station site are considered more visually prominent and contributing more to visual intrusion than the proposed activities within the Springvale Coal Services Site.

With regards to the Link Haul Road, Option 2 is considered to be the preferred option, as it offers reduced and acceptable visual impacts.

From a visual perspective the Project exists in a locale which is already largely consists of extractive industries, including mines, haul roads and bridges, conveyors and Washery, and power station elements across the undulating rural and forested landscape. The elements proposed are not out of character with existing elements in the visual catchment i.e. Haul Roads and existing haul road bridge approximately 2.5 km north of the Springvale Coal Services Site, Washery and REA mounds.

Whilst the visual impact of the Project will be considered moderate, the visual absorption capacity of the area is relatively high in relation to coal handling and coal infrastructure. Consequently, it is considered that the cumulative visual impact is considered minor to moderate.

9.6.9 Cultural Heritage

A total of 17 registered sites have been identified in the Springvale Coal Services Site. Of these sites, eight (47.5%) have been salvaged under a S90 AHIP, which means that only 52.5% of all known sites are still present onsite. If Springvale Coal opts to salvage the six newly recorded sites (isolated finds) in the Springvale Coal Services Site, this will reduce the total number of sites remaining to three (17.6%).

The CHA notes that isolated finds are a common occurrence in the landscape which cannot be contextualised or associated with an assemblage to develop an understanding of the subsistence activity once associated with the artefact. Given that the six newly recorded sites were identified in a highly modified and/or disturbed landscape, the value of these sites has also been assessed as low.

There are no cumulative impacts or foreseeable risk of harm to Aboriginal or non-Aboriginal Heritage due to the Project.

9.6.10 Traffic and Transport

Western Rail

The proposed Western rail Unloader (MP 06_0271) for the Mt Piper Power Station is located adjacent to Pipers Flat Road, mid-way between Wallerawang and Portland. Some additional construction traffic may be expected along Main Road, Wallerawang (passed the Lidsdale Siding Entrance) however it is a 50km/hr speed zone with excellent sight distance. The cumulative impact is therefore negligible.

Base Load Power Station

The Base Load Power Station Project (MP 09_0119) at the existing Mt Piper Power Station Site is expected to increase traffic along the Castlereagh Highway.

In the assessment, it was concluded that the Castlereagh Highway had a two-way capacity of just over 1,900 vehicles per hour. The current rate is approximately 430 vph and therefore the highway is assessed as being adequate to accommodate the Base Load Power Station Project and the Western Coal Services Project.

Ash Emplacement Project

The EA associated with the Ash Emplacement Project (MP 09_0186) assumes that all transport of ash does not require access to the public road network and the only potential impacts are from the travel to and from the power station by workers or construction equipment. The cumulative impact is therefore negligible.

Wallerawang Power Station DA – New Storage Silos

A DA (024/11 DA) for new storage silos at Wallerawang Power Station has been submitted to NSW Department of Planning. Whilst there is no information available for this Project, it is unlikely to generate additional traffic on the Castlereagh Highway in the vicinity of the Springvale Coal Services Site.

Pine Dale Coal Mine

A Part 3A application (MP 10_0041) for an open cut mining extension to the Pinedale Coal Mine (Yarraboldy Extension) was approved in February 2011. The Proponent does not plan to increase production beyond the current approval of 350 000 tpa, and the total number of truck despatches from the Project Site would not increase due to the increased utilisation of the Angus Place to Mt Piper Haul Road however staff numbers will increase. The proposed traffic generation is approximately 226vpd, or 48vph.

Blackmans Flat Waste Management Facility

The Blackmans Flat Waste Management Facility DA was lodged by LCC and approved in 2006. The site is within the Springvale Coal Services Site.

The TIA for the DA determined that:

- A minor increase (7% above current AADT volumes) in traffic volumes on the Castlereagh Highway, both during construction and operation;
- This increase would be within the capacity of this type of road;
- The development would result in a significant increase in the use of the intersection of the site access road and the Castlereagh Highway; and
- The intersection is recommended to be upgraded to the RTA's 'Road Design Guide' layout for 'CHR' right turn treatment and 'AUL' left turn treatment.

9.6.11 Economic

The positive economic impact of mining and related services to the regional community is substantiated through both the assessment of economic impacts undertaken in this document, and in the conclusions contained in the LCC Economic Development Strategy (LCC EDS). The evidence suggests that the positive effects of these contributions on the regional economy are significant and apparent. The LCC EDS in particular emphasises the economic risk that possible reductions in mining activity pose for the region. The mining sector is the major regional economic driver of the sustainability of commercial, retail and service

industries in the area. The Project will promote intra-generational equity, as it will facilitate the continuation of mining at a level that supports present mining production and employment, and contributes to sustaining the local economy to the benefit of the broader community. The benefits of increased access to export markets that the infrastructure upgrade would facilitate also have broader positive implications for the NSW and Australian economies over a period of approximately 20 years.

From the perspective of intergenerational equity, the continued operation of Centennial's mining activities supported by the Project will also sustain longer-run employment in the mining industry, and in the sectors that benefit from the flow of mining-related expenditure and incomes through the regional economy. A withdrawal or reduction in these economic stimuli would have broader and longer-term impacts, negatively affecting the sustainability of businesses in the Lithgow region and placing the availability of more diverse local employment opportunities at risk.

In addition to consumption effects, such direct and extended impacts would also be likely to entail household wealth effects in the region. A decline in overall business activity that would flow from any significant curtailment in mining may result in negative impacts on property values and other forms of savings that have some influence on longer-term household finances. In order to address associated changes in lifetime consumption preferences, households may reduce immediate consumption, further inhibiting regional economic stability. It is clear that the LCC EDS anticipates such a threat in relation to possible contraction of the regional mining industry. It follows, that in its key role in augmenting Centennial's current export capability, the Western Coal Services Project will provide greater certainty for the regional economy over the life of the Project and those of the mines it will support. From a public administration perspective, the Project will forestall reductions in mining activity, which in turn will contain increases in transfer payments and other reactive solutions that create demands on public finances and other resources.

With particular regard to the most affected residents of Blackmans Flat, there are also qualitative intergenerational impacts. As is noted in the SIA, these affected parties expressed concerns in relation to ongoing financial security and health, among other issues. Springvale Coal has developed, following direct engagement with residents in the main residential area of Blackmans Flat, a strategy to manage the cumulative impacts resulting from the various incompatible land uses.

9.6.12 Sensitivity Analysis

This Sensitivity Analysis has been prepared in accordance with the Director General's Requirements (DGR) for the Project, and as part of the prioritisation of the potential environmental impacts. The underlying assumption in this analysis is that the Project is adopted as the 'base case' against which alternative scenarios may be compared.

The principal 'environment' is the main residential area of Blackmans Flat, which has been identified as the primary affected area. The broader Lithgow LGA is also considered as a relevant environment, though one which would experience the positive and negative impacts of the Project and the activities it supports. Operational impacts are of lesser concern to this broader Lithgow area. As a consequence, the chief focus of the Sensitivity Analysis is the community of Blackmans Flat.

Mitigation is a means of minimising the identified adverse impacts to sensitive receptors (e.g. the social amenity of Blackmans Flat) and could result in a number of scenarios being employed. Not proceeding with the upgrade of the Springvale Coal Services Site due to potential impacts is one scenario. The outcome of this would be limited access to the coal export market (via Springvale Mine and Angus Place Colliery), and a potential sterilisation of access to other coal resources (e.g. the Neubeck Project). Therefore, it could be argued that the capital investment required to upgrade the Springvale Coal Services Site would not be justified. Although this approach would eliminate any additional cumulative impacts to the Blackmans Flat community, this option would not address existing land use conflicts, which community consultation indicates

are already 'unresolvable'. This scenario would also produce a negative impact on the broader community of the Lithgow LGA, as the ultimate result may be a reduction in planned future mining, with the harmful economic effects associated with such an outcome.

With respect to the Project 'base case', mitigation of impacts must take into account a range of factors, which include the viability of the strategic goals of the Project and the sensitivity of the surrounding environment (i.e. the community). It is understood that the most comprehensive mitigation measures possible, that still enable the delivery of a viable Project, have been assessed. These mitigation measures include the feasibility of two haul road options being explored; the REA being located away from the residential area of Blackmans Flat; and a range of management practices and controls to mitigate day-to-day operational impacts (e.g. noise, dust etc) as far as practical. Regardless of the proposed development at Springvale Coal Services Site, the history of development around Blackmans Flat has seen the social amenity 'overtaken' by the surrounding industry, which is now the dominant land use. Therefore, despite the importance of these mitigation measures, they are ineffective in addressing the social environment at Blackmans Flat.

In practical terms, the two scenarios mentioned above are the only two viable scenarios that can be assessed as plausible. An alternative, involving removal of certain elements of the Project (for example, the new Link Haul Road), would render the entire project both operationally and commercially invalid. Further, a proposal that contained lesser mitigation strategies to those currently proposed for the Project is not feasible, as it does not meet Springvale Coal's statutory and corporate obligations with respect to environmentally sustainable development

There are several other individual residences located near infrastructure associated with components of the Project, such as the existing overland conveyor, surface facilities and private haul roads. The impacts on these residences relate primarily to an individual source that can, and largely is, being controlled or subject to planning conditions. As such, the Project involves continuation of these operating controls and management strategies.

There are also communities located further afield, such as: Cullen Bullen, approximately 6 km north of Mt Piper Power Station; Portland, being located approximately 4 km west of Mt Piper Power Station; and Lidsdale, being approximately 4.5 km south-east of the Springvale Coal Services Site.

The residents of Cullen Bullen are dominated by the three surrounding mining operations, the Castlereagh Highway and to a lesser extent, Mt Piper Power Station. The Springvale Coal Services Site, having now ceased open cut extraction and being solely engaged in coal processing, handling, reject disposal, and its progressive rehabilitation activities, was considered to have only minor impacts on Cullen Bullen. Nor would the Project measurably contribute to cumulative dust or noise impacts. This was confirmed by initial air quality and noise modelling which showed that the Project would result in insignificant levels of dust beyond Mt Piper Power Station, and that noise levels would be well below background levels at a similar distance. As such, the measurable impacts of the Project are confined to a relatively small area, but one which encompasses the immediate village residents of Blackmans Flat.

In terms of cumulative impact on residences, the identified projects that were considered included the proposed activities at Mt Piper Power Station, Wallerawang Power Station, Pine Dale Mine, Springvale Colliery, Angus Place Colliery, Lithgow Council Waste Disposal Facility, Western Matrix Resource Recovery Project, and the Lidsdale Siding upgrade. Other mining operations in the district, including Invincible Mine, Cullen Valley Mine, Baal Bone Colliery, Airly Mine and Charbon Colliery, were considered too far away to be included in any meaningful assessment of cumulative impacts when combined with the Project.

Visual impacts to residents, tourists and passing traffic were a key consideration. The Project involves the construction of a bridge to take the Angus Place Colliery to Mt Piper Power Station private haul road into the Springvale Coal Services Site. This will be the third bridge along the Castlereagh Highway, the first being the

rail bridge near Wallerawang Power Station and the second being the private haul road bridge leading into Mt Piper Power Station. The cumulative visual impact was identified as requiring further assessment.

Other issues considered in the Sensitivity Analysis were surface water and aquatic ecology. Although the Project will provide improvements to water quality leaving the site, there has been a long history of mining related impacts on the receiving waters of Wangcol Creek. Wangcol Creek flows into the Coxs River, which in turn flows into Lake Wallace. This is a controlling structure used as the main water supply dam for the power stations. Water is also pumped from Lake Lyell on the Coxs River further downstream back into Lake Wallace. This provides an overall highly regulated water system for the upper reaches of the Coxs River. The risk of environmental harm to the Coxs River, which is part of Sydney's water supply scheme is considered negligible.

An additional consideration is the current EPA licence review process for the Springvale Coal Services Site, which has provided the main mechanism for progressive improvements in water quality. This process will continue and will result in positive impacts on Wangcol Creek. Further assessments of downstream water quality and aquatic ecology are being undertaken as part of a separate process and, although the results to date are not included in this EIS, the cumulative impacts to Wangcol Creek are considered positive and therefore not subject to specific or additional mitigation measures or offsets.

10.0 Statement of Commitments

Springvale Coal is committed to the identification, mitigation and management of potential risks from the continued operations of the Springvale Coal Services Site, existing Haul Roads, existing Overland Conveyors, Kerosene Vale Stockpile Area and the Lamberts Gully Open Cut Mine. Operations associated with these sites and areas have been in place for a number of decades. Key management plans are already well developed and in place to manage and monitor the performance of these operations and these include those listed in **Table 65.**

Table 65 Existing Management Plans for the Western Coal Services Project

Title	Objectives	Update required after Project Approval
Springvale Coal Services Site Operations		
Rehabilitation and Landscape Plan, Rehabilitation Plan and Closure Plan	▪ Provision of pollution control systems to protect water ways and surrounding ecosystems; ▪ Progressive rehabilitation of disturbed areas to a safe and stable landform compatible with the surrounding land uses; ▪ Provision of suitable waste management systems; ▪ Control of soil erosion; ▪ Control of noxious weeds and vermin; ▪ The lodgement of security deposits to ensure compliance with conditions and a regular review of these amounts in line with environment liability; and ▪ Upon the decommissioning of the site, removal of plant and infrastructure, and making the site safe.	A single Rehabilitation Plan will be prepared for the entire PAA.
Water Management Plan.	This plan was originally developed under the Lamberts Gully Open Cut approval (PA06_017) and regularly updated. The plan covers progressive upgrading of the water management system at the Springvale Coal Services site through containment of dirty water from disturbed areas, recycling of process water and progressive and improved separation of clean water which passes through the site.	A single Water Management Plan will be prepared for the entire PAA in consultation with the EPA, SCA and NOW as discussed in **Table 67**.
Dust Management Plan.	This plan has been developed to monitor the dust emissions from the site. The plan outlines the air quality control measures and management strategies, and the monitoring system in place at the Springvale Coal Services Site.	A single Dust Management Plan will be prepared for the entire PAA in consultation with the EPA as discussed in **Table 67**.
Noise Management Plan.	This plan covers the existing Washery operation, reject disposal activities and the previous Lamberts Gully Open Cut.	A single Noise Management Plan will be prepared for the entire PAA in consultation with the EPA as discussed in **Table 67**.
Erosion and Sediment Control Plan.	This plan covers earthmoving and vegetation clearing associated with the previous Lamberts Gully Open Cut operation.	A single Erosion and Sediment Control Plan will be prepared for the entire PAA in consultation with the EPA as discussed in **Table 67**.

Title	Objectives	Update required after Project Approval
Bushfire Management Plan.	This plan identifies the existing infrastructure that may be at risk from bushfire passing through the adjacent State Forest. The main objective is to establish and maintain a sufficient asset protection zone.	No.
Hazardous Substances Management Plan.	This plan details the existing fuel, oil and chemical storages facilities on site, documents management procedures and provides the MSDS register	No.
Slope Stability Management Plan.	The objective of this plan is to ensure that all slopes created on site are constructed safely. This includes open cut highwall and low walls, road batters, REA emplacements and access ramps.	The Slope Stability Management Plan requires updating to include the new REA and remove aspects relating to the previous open cut operation.
Reject Emplacement Procedure.	This plan provides specific procedures covering the existing disposal of reject in the A Pit REA. The plan includes an inspection regime for pipes, pumps and ponds.	The Reject Emplacement Procedure requires updating to incorporate the new infrastructure.
Existing Haul Roads Operations		
Wallerawang Haul Road Inspection Protocol.	This plan provides for the ongoing inspections of the Wallerawang Haul Road. These inspections cover condition of road surface and drainage provisions.	A consolidated Haul Road Management Plan will be prepared for the entire PAA.
Wallerawang Haul Road Landscape Management Plan.	Prepared in response to the Angus Place project approval (PA 06_0021), this plan provides for the establishment and maintenance of landscaping measures to minimise the visual impact of the haul road, particularly those from residential areas. It also provides for the ongoing maintenance of the landscaping works.	A consolidated Haul Road Management Plan will be prepared for the entire PAA.
Noise Management Plan (Haul Roads).	This plan covers noise monitoring and management procedures covering truck transport to both Mount Piper and Wallerawang Power Stations.	A single Noise Management Plan will be prepared for the entire PAA in consultation with the EPA as discussed in **Table 67.**
Kerosene Vale Stockpile Area Operations		
Draft Kerosene Vale Rehabilitation Plan.	This plan provides for the progressive rehabilitation of areas of the Kerosene Vale storage area that are not required for ongoing operations	A single Rehabilitation Plan will be prepared for the entire PAA in consultation with DRE as discussed in **Table 67**.

Notwithstanding the above, the DGRs issued for the Project also require that the EIS includes a summary of all proposed environmental management and monitoring measures, herein referred to as a Statement of Commitments. In addition to the above existing plans of management, **Table 66** and **Table 67** detail the Statement of Commitments for the Project that Springvale Coal is willing to adopt for implementation throughout the Project development phase and through to the end of the Project life, respectively, should approval be granted under Part 4 of the EP&A Act.

Table 66 Project Development Phase – Statement of Commitments

Desired Outcome	Action
Development Phase	
All construction operations are appropriately undertaken to minimise potential impacts to the environment.	**1.1** Appropriate erosion and sediment control measures will be implemented for construction of the upgrading of the Washery and associated infrastructure (additional conveyors and transfer points on the Springvale Coal Services Site, refer to **Figure 8)**, extension and enlargement of the existing REA, and construction of the Link Haul Road and overpass of the Castlereagh Highway and will be installed prior to commencement of disturbance activities, generally in accordance with the guidelines '*Managing Urban Stormwater – Soils and Construction, Volume 2E: Mines and Quarries' (DECC 2008).* **1.2** Prior to construction a CEMP will be prepared for the Springvale Coal Services Site that will be implemented during the construction phase and will include: ▪ Noise Management Plan; ▪ Air Quality Management Plan; ▪ Site Water Management Plan; ▪ Groundwater Management Plan; ▪ Cultural Heritage Management Plan; ▪ Weed Management Plan; and ▪ Construction Traffic Management Plan.

Table 67 Project Operation - Statement of Commitments

Desired Outcome	Action
1.General	
All operations are undertaken in a manner that will minimise the environmental impacts associated with the Project.	**1.1** Operations will be undertaken generally in accordance with the description provided in this EIS dated April 2013.
2. Hours of Operation	
All operations are undertaken within the approved operating hours.	**2.1** Operations may be undertaken 24 hours a day 7 days a week.
3. Noise and Vibration	
All noise impacts are minimised to the greatest extent possible.	**3.1** Removal of the northern two thirds of the existing Co-Disposal REA at the Springvale Coal Services Site within five years of Project Approval. **3.2** The construction of the Link Haul Road in the location as depicted in **Figure 1**. **3.3** Material haulage will be managed to maintain compliance with the approved noise criteria on the private Haul Roads. **3.4** Reduction of truck movements along Mt Piper Haul Road during prevailing noise enhancing weather conditions in order to meet the nominated Project Specific Noise Criteria. The default level will be zero trucking during these conditions until such time as noise monitoring confirms the truck movements required to meet the Project Specific Noise Criteria during these conditions. **3.5** Within 6 months of the date of the Project Approval, A Noise Management Plan will be prepared for the entire PAA. The plan will be prepared in consultation with the EPA. The Noise Management Plan will include the existing monitoring and mitigation strategies contained in the current approved Angus Place Noise Monitoring program, specifically, quarterly inspections of road surfaces, quarterly attended and unattended monitoring to assess compliance and additional noise monitoring in response to noise complaints. The Noise Management Plan will include a protocol for determining the prevailing noise enhancing weather conditions which would trigger reduced transport on the Mt Piper Haul Road. **3.6** The following dust mitigation measures will be implemented and will be completed prior to operating the new infrastructure : ▪ Enclosure of the existing and proposed Washery;

Desired Outcome	Action
	▪ Enclosure of conveyor transfer points; ▪ Loading of coal rejects from an enclosed bin; ▪ Majority of coal reclaimed from stockpiles via underground reclaim tunnel; ▪ Three quarter enclosed conveyors; and ▪ New Link Haul Road will be fully sealed; **3.7** Location of infrastructure as per **Figure 8**.
4. Air Quality	
All air quality impacts are minimised to the greatest extent possible.	**4.1** The following dust mitigation measures will be implemented and will be completed prior to operating the new infrastructure : ▪ Enclosure of the existing and proposed Washery; ▪ Enclosure of conveyor transfer points; ▪ Loading of coal rejects from an enclosed bin; ▪ Majority of coal reclaimed from stockpiles via underground reclaim tunnel; ▪ Three quarter enclosed conveyors; ▪ Stockpile water sprays which are wind activated; ▪ New Link Haul Road will be fully sealed; ▪ Regular use of water carts on unsealed roads trafficked by heavy vehicles. This will include the surface of the proposed REA; and ▪ Installation of a TEOM continuous atmospheric dust monitoring unit within the Blackmans Flat residential area. **4.2** Within 6 months of the date of the Project Approval, an updated Air Quality Management Plan will be prepared for the entire PAA. The plan will be prepared in consultation with the EPA.
5. Surface Water, Groundwater, Geomorphology and Aquatic	
All surface water groundwater and aquatic impacts are minimised to the greatest extent possible.	**5.1** Within 6 months of Project Approval a single Water Management Plan will be prepared for the entire PAA and will include operation of the new infrastructure, water recycling system, surface and groundwater monitoring including Wangcol Creek mixing zone and a staged implementation of the separation of the Lamberts Gully drainage line as it passes through the Springvale Coal Services Site as well as the localised changes associated with approved Mt Piper Power Station Ash Emplacement Project. **5.3** Within 5 years of the date of the Project Approval, complete the separation of clean and dirty water at the Springvale Coal Services Site. The design will include the diversion of upstream catchments of Huon Gully around the new REA. The sub-catchment containing the existing A Pit REA (previously the Lambert Gully upstream of the Springvale Coal Services Site Open Cut) as well as the new REA will be diverted into the New Sediment Dam. This sub-catchment currently discharges to Huon Gully without treatment and the staged bypass and therefore the proposed change will lead to improved water quality in Huon Gully. Following remediation of the new REA, this sub-catchment of Huon Gully will be restored. **5.4** Construct a staged bypass of the Conveyor Dam and Retention Pond on the Springvale Coal Services Site within 3ears of the date of the consent. **5.5** Construct a pollution control pond control runoff from the new REA. This structure will have a capacity of approximately 15 Ml and will be located on the north-eastern corner of the REA. The dam will have a pipe connection to the existing Washery Dam, which is connected to Cooks Dam via a pipeline. This will enable treated stormwater from the new REA to be recycled back to the Washery via Cooks Dam. This dam is to be constructed once the current A Pit REA is completed but prior to the base of the new REA being completed. **5.6** Provision of a belt press filter system (or equivalent) to recover water from the tailings produced from the new Washery. This water recovery system will cover tailings produced from the existing Washery but will be installed as part of the construction of the new Washery. **5.7** Apply for a separate EPL covering the entire PAA that includes LDP 003 (Kerosene Vale Stockpile Area) and LDP 006 and LDP 007 (conveyor at Duncan Street, Lidsdale). **5.8** Within 3 months of consent apply to relocate the current LDP006 to the spillway of Cooks Dam and replace the existing LDP006 with a license monitoring point.

Desired Outcome	Action
	5.8 Within 6 months of completion of the Link Haul Road, complete the additional riparian planting for a 100 m section of Wangcol Creek downstream of the Link Haul Road crossing. The species selection and density is to be determined in consultation with the SCA and NOW. **5.9** Within 12 months of Project Approval, site specific trigger values based on ANZECC 2000 Guidelines will be developed for Wangcol Creek. **5.10** To better understand the groundwater linkages, within 12 months of Project Approval, a baseline groundwater monitoring program will be established for the Springvale Coal Services Site. The baseline groundwater monitoring program will include: ▪ Quarterly monitoring of water levels from a network of monitoring bores following the completion of construction; ▪ Six monthly sampling of monitoring bores for field analysis of pH, EC and temperature and laboratory analysis on major ions, pH, EC, TDS, dissolved arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel and zinc; and ▪ An annual review so that its capacity as an accurate predictive tool can be assessed and maintained.
6. Visual	
All visual impacts are minimised to the greatest extent possible.	**6.1** Prior to its' completion, the battered slopes of the Link Haul Road overpass bridge will be planted with low maintenance hardy groundcover flowering species. **6.2** Staged rehabilitation of the REA will be in accordance with the timeframes provided within the EIS.
7. Aboriginal Heritage Management	
Ensure that identified and unidentified Aboriginal Sites are appropriately managed.	**7.1** Within six months of Project Approval, a CHMP will be prepared as part of the ongoing management of the Springvale Coal Services Site. The CHMP which will be developed in consultation with the Aboriginal Stakeholders.
8. Traffic Management	
Project-related impacts on the road network are limited.	**8.1** The Link Haul Road will be constructed in accordance with AUSROADS Guidelines in consultation with RMS. **8.2** All construction sites associated with the infrastructure upgrade prepare and implement a Construction Traffic Management Plan; and **8.3** Upgrade Springvale Coal Services intersection line-marking to RMS standards.
9. Contamination	
Potential contamination impacts are minimised to the greatest extent possible.	**9.1** A Phase 2 Assessment of the entire will be conducted before February 2015, in accordance with Springvale Coal's stated commitments to the NSW EPA (letter dated 2 February 2012).
10. Rehabilitation	
Rehabilitation of the Springvale Coal Services Site is conducted in accordance with Industry Standards.	**10.1** Within six months of Project Approval a single Rehabilitation Plan will be prepared for the entire PAA in consultation with DRE and DPI and will include the timeframes provided within this EIS, details of the rehabilitation methods, monitoring and reporting framework. Results arising from the implementation of the program will be reported each year in the Annual Review (currently referred to as the AEMR). **10.2** The rehabilitation program will include previous commitments from the Lamberts Gully Project Approval (06-0017) including *Eucalyptus cannonii*.

11.0 Justification and Conclusion

11.1 Environmental Impacts

As detailed in Section 9, the potential environmental impacts of the Project have been identified and assessed using a risk based process. The key issues identified were the subject of comprehensive specialist assessments, which are appended to this EIS.

The potential environmental impacts of the Project have been kept to a minimum through:

- The location of the proposed Link Haul Road (Option 2 – western alignment, refer to **Figure 22**) from the Springvale Coal Services Site to the existing Angus Place to Mt Piper Haul Road with the overpass of the Castlereagh Highway approximately 300 metres from the existing entry point to the Springvale Coal Services Site. The Link Haul Road will be fully sealed;
- The removal of the eastern REAs at the Springvale Coal Services Site thus reducing noise and visual impacts on the main residential area of Blackmans Flat;
- The improved separation of clean and dirty water at the Springvale Coal Services Site. The design will include the diversion of Huon Gully into Lamberts Gully upstream of the Springvale Coal Services Site, staged bypass of the Conveyor Dam and Retention Pond, construction of a pollution control pond to control runoff from the new REA, and the provision of a belt press filter (or equivalent) to recover water from the tailings produced from the new Washery;
- The confinement of new infrastructure predominately to existing disturbed areas of the Springvale Coal Services Site;
- Obtaining a detailed understanding of the issues and potential impacts for the Project using a risk-based approach to appropriately identify and assess relevant environmental aspects (see Section 9). The multi-disciplinary assessment and consultation has been to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted;
- Implementation of the existing proactive strategies and management plans employed within the PAA to avoid, minimise, mitigate, and manage potential impacts, with commitment to update those or develop new plans where required, see **Table 68** below and Section 10; and
- Implementation of the Statement of Commitments, see Section 10.

While the information presented within Section 9 and appended to this EIS should be read in its entirety, **Table 68** provides a very broad overview of the key outcomes of the environmental impact assessment.

Table 68 Broad Overview of Environmental Assessment Issues

Environmental Issue	Overview of Key Findings
Noise and Vibration	▪ Modelled predictions indicate that the Project will comply with the Industrial Noise Policy (INP) Project Specific Criteria in the locality of Lidsdale, Wolgan Road and Springvale. ▪ Modelled predictions indicate that the Project will comply with short term noise goals of the draft conditions of consent for the Lidsdale Siding Project (MP 08_0223). ▪ Modelled predictions indicate that there will be likely residual noise impacts above the Industrial Noise Policy (INP) Project Specific Criteria at some receptors at the main residential area of Blackmans Flat. ▪ Modelled predictions indicate that there will be likely residual noise impacts above the Industrial Noise Policy (INP) Project Specific Criteria at some receptors in the locality of Blackmans Flat. ▪ Sleep disturbance modelling indicates that maximum noise levels generated by the Project will comply with sleep disturbance goals at the closest, potentially most affected receptors in Wallerawang, Lidsdale and Springvale. Predicted maximum noise levels from the Project at the main residential area of Blackmans Flat and Wolgan Road receptors show potential exceedance of the noise goals but are below a level that is considered to cause awakening reactions. ▪ During the night period the modelling indicates the cumulative amenity noise level exceeds the acceptable level of 40 dBA at Blackmans Flat (Locations B2 and B17), refer to **Figure 23** of EIS for these locations, but remains below the maximum noise level of 45 dBA. ▪ With the exception of some residential lots at Blackmans Flat (B2, B4 B5 and B6), refer to **Figure 23** of this EIS, modelled predictions for the construction phase of the Project indicate that noise emission from construction will comply with the noise affected management level. However, the predicted construction noise levels are below the highly noise affected level for the scenarios considered. ▪ Predicted vibration levels for the construction and operation of the Project are significantly below damage and annoyance risk criteria at all times. ▪ Mitigation measures that will be implemented include the removal of the eastern REAs at the Springvale Coal Services Site, the construction of the Link Haul Road in the location as depicted in **Figure 1**, material haulage will be managed to maintain compliance with the approved noise criteria on the private Haul Roads, and reduction of truck movements along Mt Piper Haul Road during prevailing noise enhancing weather conditions in order to meet the nominated Project Specific Noise Criteria.
Air Quality	▪ Modelled predictions indicate acceptable air quality impacts at all privately owned receptors. ▪ Mitigation measures outlined in the Springvale Coal Services PRP 2012 will be implemented.

Environmental Issue	Overview of Key Findings
Water Balance, Surface Water and Geomorphology	▪ The existing coal processing operation uses 0.885 ML per day which will increase to a total of 2.725 ML per day with the increase coal processing and dust controls. The project has incorporated increased water recycling capability to remove and recover water from the tailings. This will result in approximately 1.5 ML per day of water recovery and recycling and only 0.34 ML per day of make-up water required. ▪ The project provides for an additional 15 Ml of pollution control storage, additional drainage collection and separation of the process water circuit water, completion of the separation of the Lamberts Gully drainage line from disturbed areas and additional rehabilitation commitments. This work will provide improvements in the discharge quality leaving the site and a reduction in the volume of process water discharge. ▪ It is proposed to relocate the Licensed Discharge Point to the spillway of Cooks Dam which will represent the final discharge from the operational footprint. The existing location at the site entrance includes a mixture of natural flows from the Lamberts Gully catchment and process water discharges. This location would be converted to a monitoring point to obtain data on the effectiveness of the upgraded water management system. ▪ The Water Balance modelling has shown that the Springvale Coal Services site will still be a net producer of water during average rain years but there will be a water deficit for 20 to 30% of days in future. During low rainfall periods and drought conditions, water makeup will be provided from the Springvale Mine via a water supply pipeline along the overland conveyor. ▪ The Geomorphology Assessment identified measures needed to protect Wangcol Creek during both construction and operation of the private haul road link. These measures included scour protection and sediment controls and form part of the project.
Groundwater	▪ The groundwater regime at the Springvale Coal Services site is complex due to the interaction between old underground and open cut mine workings. A groundwater model was established and predicted that as a result of the Project there will be slightly higher groundwater inflow to the existing DML and Cooks Dams of around 7.7m^3/day (a net increase of 4.7m^3/day) following 25 years of reject emplacement in the designated area. This slight increase will occur as a result of increased direct recharge to high permeability backfilled areas as opposed to the current runoff and high evaporation from those areas. The increased groundwater flow does not represent a net loss of groundwater. ▪ Wangcol Creek down gradient from the Springvale Coal Services site is a losing creek, that is, surface flow in the creek enters the groundwater system rather than the creek being fed by groundwater. ▪ Additional groundwater monitoring bores will be installed in order to better understand the groundwater movement between Wangcol Creek and the Springvale Coal Services Site.
Social	▪ According to the SIA, conventional measures to reduce the impacts (noise, visual, dust) will not address the cumulative impacts that have occurred over many years for the main residential area of Blackmans Flat. Lithgow Council's Land Use Strategy acknowledges this and has identified that the future zoning of Blackmans Flat will need to recognise the dominant land use – which is heavy industry, therefore removing opportunities to protect residential amenity. ▪ A strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents has been developed. This strategy will mitigate the impacts of the Project related to noise, dust and visual amenity on the main residential area of Blackmans Flat. The Strategy will result in an individual agreement with each private property owner in the main residential area of Blackmans Flat and allow for the Project to be developed to its full potential and positively contribute to the long term viability of the industry in the region.

Environmental Issue	Overview of Key Findings
Terrestrial Ecology	▪ There are no significant impacts on the ecology of the Springvale Coal Services Site, including vegetation communities, threatened flora and fauna or endangered ecological communities that are known or expected to occur. ▪ There are no significant impacts on threatened species or Endangered Ecological Community (EECs) listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act 1995), or Matters National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).
Aquatic Ecology	▪ The Coxs River at the junction of Wangcol Creek plus Wangcol Creek and its sub-catchment tributaries (Neubecks Creek, Huon Gully and Lamberts Gully) are listed as "Key Fish Habitat" under the *Fisheries Management Act 1994,* (FMA Act). ▪ Whilst there are no threatened aquatic species as listed under the FMA or *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) ,and none are expected, both Wangcol Creek and Coxs River support native fish and provide fish passage upstream past the Springvale Coal Services Site. ▪ Both Wangcol Creek and Coxs River are classified as Class 2 “Moderate Fish Habitat” under the NSW Department of Fisheries’ stream classification scheme. ▪ The proposed works would maintain and improve the KFH and Class 2 features of Wangcol Creek and of the Coxs River below the confluence and the positive impact of works on the Springvale Coal Services Site will be in line with the Hawkesbury-Nepean Catchment Management Authority Action Plan 2007-2016 for the upper Coxs River catchment. ▪ There are no significant impacts on adjacent aquatic habitats as impacts will be satisfactorily managed and mitigated via construction and operational Environmental Management Plans (EMPs).
Visual	▪ The VIA states that the Link Haul Road overpass is likely to create ‘visual intrusion’ and further compound the visual sensitivity of the area. However the existing Pine Dale mine site, including the existing and likely expanded overburden emplacement bund, and the Mt Piper Power Station site are considered more visually prominent and contributing more to visual intrusion than the proposed activities within the Springvale Coal Services Site. ▪ Impacts associated with the Link Haul Road overpass will be satisfactorily managed by landscaping and material selection whilst impacts associated with the extended REA will be satisfactorily managed by prompt staged rehabilitation.
Cultural Heritage	▪ A total of nine known Aboriginal sites (three existing and six new sites) are located on the Springvale Coal Services Site. Of these sites, none are at high risk of impact, one is at low-moderate risk, and eight are at low (remote) risk of impact. All Aboriginal heritage on the Springvale Coal Services Site will be managed under a Cultural Heritage Management Plan (CHMP), the Aboriginal aspects of which will be developed in consultation with the Aboriginal Stakeholders. ▪ There are no impacts on non-Aboriginal Heritage items. No mitigation measures are required.
Traffic	▪ The Project will result in a slight increase in light vehicles entering and exiting the Springvale Coal Services Site due to additional staff numbers. There will also be a slight increase in heavy vehicles during the construction phase. To offset this, there will be no coal transported on the public road network after construction is complete. ▪ Interaction of coal haulage with traffic using public roads will be avoided by the continued use of the existing private haul roads, utilised to transport coal from Angus Place Colliery to Mt Piper and Wallerawang Power Stations. ▪ All road intersections, including the Springvale Coal Services access road intersection are considered adequate to cope with the existing and projected traffic levels. ▪ The Link Haul Road will be constructed in accordance with AUSROADS Guidelines and all construction sites will prepare and implement a Construction Traffic Management Plan.

Environmental Issue	Overview of Key Findings
Agriculture	▪ There are no significant impacts on current land use or agriculture arising from the Project.
Greenhouse Gas	▪ The Project's contribution to projected climate change, and the associated impacts, would be in proportion with its contribution to global GHG emissions. Average annual Scope 1 emissions from the Project (0.005 Mt CO2-e) would represent approximately 0.001% of Australia's commitment under the Kyoto Protocol (591.5 Mt CO2-e) and a very small portion of global greenhouse emissions, given that Australia contributed approximately 1.5% of global GHG emissions in 2005 (Commonwealth of Australia, 2011).
Economics	▪ The sustainability of employment at Angus Place Colliery is enhanced by the new infrastructure provided by the Project;. ▪ Mining is a crucial contribution to the economy of the region and beyond; and ▪ Continued opportunities for local residents in relation to employment and training.
Contamination	▪ Phase 1 Environmental Site Assessments have been carried out for the Springvale Coal Services Site and the Kerosene Vale Stockpile Area, with each Assessment recommending Phase 2 Environmental Assessments to be carried out.
Hazards	▪ Of the hazards assessed (including bushfire, unauthorised access, hazardous materials, and traffic) the Project is not expected to result in an increased environmental or safety risk.
Waste	▪ All waste generated during construction on the Springvale Coal Services Site will be reused or removed from the work areas at regular intervals by a suitably qualified contractor and disposed of as required at an approved waste facility. ▪ Waste generated during operation of the Project will be managed in accordance with existing Waste Management protocols.

11.2 Project Benefits

The SIA in Section 9.5.5 and the economic assessment in Section 9.5.13 of the EIS both outline a range of positive benefits that will accompany the Project at a local, regional and state level. While the Project does not involve any significant increase in employment it is anticipated that the sustainability of employment at Angus Place Colliery will be enhanced by the new infrastructure provided by the Project;

Overall notable benefits of the Project include, but are not limited to, the following:

- Improved water quality being discharged from the Springvale Coal Services Site as well as a reduction in the volume of process water discharged. This will result in an overall improvement in water quality and aquatic habitat condition for aquatic biota in the length of Wangcol Creek that is adjacent to the Springvale Coal Services Site;
- Improved understanding of groundwater conditions including a better understanding of the groundwater movement between Wangcol Creek and the Springvale Coal Services Site.
- The removal of the eastern REAs at the Springvale Coal Services Site thus reducing noise and visual impacts on the main residential area of Blackmans Flat;
- Improved understanding and management of Aboriginal Heritage issues on the Springvale Coal Services Site;
- Continued opportunities for local residents in relation to employment and training; and
- The sustaining of employment at the mines that the Springvale Coal Services Site services. At present, Angus Place Colliery has an approved workforce of 225 permanent employees and an additional 75 contractors. Springvale Coal Mine has 270 permanent employees. The sustainability of employment at Angus Place Colliery will be enhanced by the new infrastructure provided by the Project;
- Provision of thermal coal for domestic and international customers to provide for the energy requirements

of the people of NSW and elsewhere;

- The Project is projected to generate a benefit to the NSW and regional community of approximately $374 million;
- Centennial's operations, and the broader mining industry, are critical to the economic sustainability of the Lithgow Local Government Area and the surrounding region. This role is acknowledged in the Lithgow City Council Economic Development Strategy; and
- Following direct engagement with the residents in the main residential area of Blackmans Flat, the development of a strategy to manage the cumulative impacts resulting from a number of incompatible land uses.

11.3 Ecologically Sustainable Development (ESD)

Ecologically Sustainable Development (ESD) is a primary objective of environmental protection in NSW. ESD is an objective of the EP&A Act under Section 5(a)(vii) and is defined under Section 4 of the EP&A Act : and is a required assessment consideration under Schedule 2, Part 3, clause 7 of the *Environmental Planning and Assessment Regulation 2000*. This clause requires an environmental impact statement to include the reasons justifying the carrying out of the Project in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4): Subclause (4) defines ecologically sustainable development as:

(a) *the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

(b) *inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*

(c) *conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

(d) *improved valuation, pricing and incentive mechanisms – namely, that environmental factors should be included in the valuation of assets and services , such as:*

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The overall objectives of ESD are to use, conserve and enhance natural resources. This ensures that ecological processes are maintained, facilitating improved quality of life, now and into the future.

Springvale Coal is committed to the principles of ESD and understands that social, economic and environmental objectives are interdependent. The Western Coal Services Project acknowledges that a well-designed and effectively managed operation will avoid significant and/or costly environmental impact or degradation. The existing environmental management plans have been developed to appropriately identify, avoid, mitigate and manage environmental risk. These existing environmental management plans demonstrate environmental due diligence by Springvale Coal and provide procedures for on-going and adaptive management and monitoring of the Project in line with the objectives of ESD.

11.3.1.1 The Precautionary Principle

The precautionary principle, in summary, holds that where there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Through the development of the Project, the Project team:

- Identified the sensitive surface features and implemented design criteria to avoid impacts through:
  - The location of infrastructure in existing disturbance footprints;
  - The location of infrastructure away from sensitive receivers; and
  - The use of existing infrastructure at existing approved limits;
- Commissioned specialist assessments for activities with the potential to significantly impact the community, biodiversity, surface water, groundwater and stream geomorphology that demonstrate certainty of environmental consequences; and
- Developed adaptive mitigation and management measures to take into consideration changes in technology, understanding of issues and implementation of the results of initiatives such as real time air quality monitoring.

Detailed understanding of the issues and potential impacts associated with the Project has been obtained via consultation and assessment to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted.

Specialist assessments, including the use of engineering and scientific modelling, have been undertaken for the design of the Project for impacts relating to noise, air quality, greenhouse gas, social issues, surface water, groundwater, biodiversity; economic issues, traffic and transport, visual issues, heritage, contamination, soil, land and agriculture considerations. To this end, there has been careful evaluation undertaken in order to avoid, where possible, serious or irreversible damage to the environment. In the circumstances where avoidance was not possible, appropriately scaled mitigation measures have been developed.

11.3.1.2 Social Equity, Inter-Generational Equity

Intergenerational equity is centred on the concept that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. There is a moral obligation to ensure that today's economic progress, which will benefit both current and future generations, is not offset by environmental deterioration.

The primary objective of the Project is to allow continued use of existing infrastructure and maintain continuity of coal handling and processing whilst optimising resource management for the life of the Project in an environmentally and socially responsible manner. The various consultation activities that have been undertaken, as outlined in Section 6 and the engagement of suitably qualified and experienced consultants have ensured that the planning, design and environmental assessment phases of the Project have been

transparent. The contents of this EIS report (including appendices), combined with the consultation activities, has enabled Springvale Coal to understand the potential implications of the Project and therefore identify the required management strategies, mitigation measures and monitoring activities to ensure potential for impact is appropriately minimised.

The management strategies, mitigation measures and monitoring programs have been identified to minimise adverse impact upon the local environment and the community of Blackmans Flat. Emphasis has been placed on anticipation, avoidance and mitigation of potential impacts, as opposed to undertaking later remedial action.

These actions will assist in ensuring that current and future generations can enjoy equal and equitable access to social, environmental and economic resources through the maintenance of the health, diversity and production of the environment.

11.3.1.3 Conservation of Biological Diversity and Ecological Integrity

The principle of conservation of biological diversity and ecological integrity holds that the conservation of biological diversity and ecological integrity should be a fundamental consideration for the Project.

The potential environmental impacts of the Project, including upon ecological communities and habitat values and measures to ameliorate these potential impacts, are detailed within this EIS. The Project has sought to avoid, minimise and mitigate potential impacts on ecological values within the PAA through a risk-based approach that avoids impacts on the surrounding ecology through the use of the existing disturbance footprint. Where additional disturbance is proposed (that is, through the construction of the Link Haul Road), consideration has been given to a range of potential environmental impacts, including biodiversity.

A specialist ecological investigation was undertaken for the Project (including identification and assessment of any EECs which indicates that there were no significant impacts identified on vegetation communities, threatened flora and fauna, or to the connectivity of habitats.

11.3.1.4 Improved Valuation and Pricing of Environmental Resources

The principle of improved valuation, pricing and incentive mechanisms deems that environmental factors should be included in the valuation of assets and services. The cost associated with using or impacting upon an environmental resource is seen as a cost incurred to protect that resource. Bases for evaluating costs relating to issues of noise, air quality, greenhouse gas emissions, soil and water, traffic and transport, biodiversity, heritage and visual aspects, utilising valuation methods derived from studies accessed through relevant government bodies, have been used in the preparation of the EIS.

Whilst clear and widely accepted standards have not yet been established for the application of this principle (to date there are few widely accepted methods by which monetary values are attributed to environmental factors), Springvale Coal has, through the economic assessment for the Project, researched the available literature to determine appropriate measures for environmental factors. This approach acknowledges and accepts the financial costs associated with all the measures required for the Project to avoid, minimise, mitigate and manage potential environmental and social impacts for the proposed Project.

11.4 Conclusion

The Western Coal Services Project is comprised of the Springvale Coal Services Site, the Kerosene Vale Stockpile Area, existing private haul roads and existing overland conveyor. These sites and infrastructure are well established and operate under existing approvals. Key aspects of the Project trigger the

requirements of Division 4.1 of Part 4 of the EP&A Act ‘‘SSD’’ in accordance with the SEPP *(State and Regional Development)* 2011.

The Project has been developed to provide flexibility to respond to changing market trends. It provides both security for the operations of Angus Place Colliery and Springvale Coal Mine, and an opportunity for future projects in the local area. The Project will also provide additional flexibility to access to both the domestic and export markets.

The linkage of the Springvale Coal Services Site to the existing Lidsdale Siding (with recent approval for upgrading as per Project Approval 08_0223) creates synergies for Centennial’s coal operations and reduces the potential impacts on the community through the utilisation of existing infrastructure and the upgrading of these facilities that will further reduce those environmental impacts. The objectives of the Project are to:

- Upgrade the existing Washery, and supporting infrastructure within the Springvale Coal Services Site by constructing a new Washery adjacent to the existing facility that will remain operational to provide a total processing capacity of up to 7 Mtpa;
- Construct processing infrastructure including additional conveyors and transfer points and other coal handling requirements to cater for the upgraded Washery facility within the existing disturbance footprint of the Springvale Coal Services Site;
- Extend and enlarge the existing REA on the Springvale Coal Services Site to enable sufficient reject disposal capacity for a 25 year life;
- Construct a private Link Haul Road, approximately 1.3 km in length, linking the Springvale Coal Services Site with the existing private haul road from Angus Place Colliery to Mt Piper Power Station. The private Link Haul Road will cross a section of the existing Pine Dale Mine operation and over the Castlereagh Highway via the construction of a road bridge;
- Improve the current water management systems on the Springvale Coal Services Site by separating clean and dirty water streams prior to either reuse or discharge off site;
- Integrate the remaining rehabilitation, monitoring, water management and reporting requirements associated with the now closed Lamberts Gully Open Cut Mine which occupies the Springvale Coal Services Site;
- Integrate the existing approved transport of coal from Springvale Coal Mine and Angus Place Colliery into the one consent;
- Increase the utilisation of the return side of the existing overland conveyor system to enable up to 6.3 Mtpa of coal to be delivered to Lidsdale Siding; and
- Continue use of all existing approved infrastructure, facilities and activities associated with the transport and processing of coal from each mine gate and the point of delivery to the Springvale Coal Services Site. This infrastructure includes the existing conveyors, private haul roads, Kerosene Vale Stockpile Area, REAs, services, access roads, car parks and buildings.

Community benefits of private road haulage are maintained with the proposed Link Haul Road from the existing Angus Place to Mt Piper Haul Road to the Springvale Coal Services Site.

The Project has been assessed using a risk-based approach to appropriately identify and assess environmental aspects relevant to the Project. The assessment has been multi-disciplinary and also involved consultation with various government agencies, as well as, Aboriginal and community groups. Emphasis has been placed on anticipation and prevention of potential environmental and social impacts, with management strategies, mitigation measures and monitoring activities identified to keep potential impacts to a minimum.

Springvale Coal has shown a commitment to the principles of ESD and understands that social, economic and environmental objectives are interdependent. Springvale Coal acknowledges that a well designed and effectively managed operation will avoid significant and/or costly environmental impact or degradation. The Project design and the suite of existing environmental management plans have been developed on a risk-

basis to appropriately identify, mitigate and manage environmental risk. These demonstrate environmental due diligence and provide procedures for on-going management and monitoring of the operation in-line with the objectives of ESD.

The socio-economic output of the Project, particularly in terms of indirect employment and flow-on benefits, is anticipated to make a positive contribution to the Lithgow LGA and the surrounding region, and as a continuing operation, the Project will not significantly influence social and community infrastructure requirements.

Accordingly, it is considered that the Project will meet environmental performance and socio-economic benefit requirements in order for the Project to be considered for approval.

12.0 Terms and Abbreviations

Abbreviation	Meaning
AADT	Annual Average Daily Traffic
ACHR	Aboriginal Cultural Heritage Consultation Requirements
AEMR	Annual Environmental Management Report
AHD	Australian Height Datum
AHIP	Aboriginal Heritage Impact Permit
ANZECC	Australian and New Zealand Environment Conservation Council
AQGHGA	Air Quality and Greenhouse Gas Assessment
BAU	Business as Usual
BBRA	Broad-brush risk assessment
CCL	Consolidated Coal Lease
CEMP	Construction Environmental Management Plan
CHA	Cultural Heritage Assessment
CHPP	Coal Handling and Preparation Plant
CLM Act	*Contaminated Lands Management Act 2008*
CHMP	Cultural Heritage Management Plan
CO_2	Carbon dioxide
CRP	Current Recommended Practices
DA	Development Application
dBA	Decibel
DECCW	Department of Environment, Climate Change and Water (NSW) (now known as Office of Environment and Heritage)
DEM	Dust Extinction Moisture
DGRs	Director General's Requirements
DII	Department of Industry and Investment (NSW) (now under Department of Trade and Investment, Regional Infrastructure and Services)
DMM	Dense Medium Module
DP	Deposited Plan
DPI	Department of Planning and Infrastructure (NSW)
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services (NSW)
EA	Environmental Assessment
EC	Electrical conductivity
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)*
EPL	Environment Protection Licence
ESA	Environmental Site Assessment
ESD	Ecologically Sustainable Development

Abbreviation	Meaning
FCM	Fine Coal Module
FMA	*Fisheries Management Act 1994*
FTE	Full time equivalent
GDE	Groundwater Dependant Ecosystem
GHG	Greenhouse Gas
GHGMP	Greenhouse Gas Management Plan
HFC	Hydrofluorocarbon
HNCMA	Hawkesbury-Nepean Catchment Management Authority
HVAS	High Volume Air Samplers
ICNG	NSW Interim Construction Noise Guideline
ILUA	Indigenous Land Use Agreement
I/O	Input/output
INP	Industrial Noise Policy
KFH	Key Fish Habitat
KTP	Key Threatening Process
LCC	Lithgow City Council
LDP	Licensed Discharge Point
LEP	Local Environmental Plan
LGA	Local Government Area
LC LEP 1994	*Lithgow City Local Environmental Plan 1994*
MCDA	Multiple Criteria Decision Analysis
Ml	Megalitres
ML	Mining Lease
MNES	Matters of National Environmental Significance
MSDS's	Material Safety Data Sheet
Mt	Million tonnes
Mtpa	Million tonnes per annum
MOD	Modification
NGER	*National Greenhouse and Energy Reporting Act 2007*
NOW	NSW Office of Water
NorBE	Neutral or Beneficial Effect
NPV	Nett Present Value
OEH	Office of Environment and Heritage
OL	Overland conveyor
PAA	Project Application Area
PAD	Potential Archaeological Deposit
PM	Particulate Matter
POEOA Act	*Protection of the Environment Operations Act 1997*
PRP	Pollution Reduction Program
RBL	Rating Background Level
REA	Reject Emplacement Area
RMS	NSW Roads and Maritime Services

Abbreviation	Meaning
RNP	NSW Road Noise Policy
ROM	Run of mine (coal yield)
RTA	NSW Roads and Traffic Authority (now RMS)
SCA	Sydney Catchment Authority
SEPP	State Environmental Planning Policy
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)
SHR	State Heritage Register
SIA	Social Impact Assessment
SSD	State Significant Development
SWMP	Surface Water Management Plan
TEOM	Tapered element oscillating microbalance
TIA	Traffic Impact Assessment
tpa	Tonnes per annum
tph	Tonnes per hour
TSC Act	*Threatened Species Conservation Act 1995*
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
VIA	Visual Impact Assessment
Vpd	Vehicles per day
Vph	Vehicle per hour
WMA	*Water Management Act 2000*
WSP	Greater Metropolitan Region Unregulated Rivers Water Sources Water Sharing Plan

Appendix 1

Director Generals Requirements and Agency Responses

Appendix 2

Noise and Vibration Impact Assessment

Appendix 3

Air Quality Impact and Greenhouse Gas Assessment

Appendix 4

Water Balance and Surface Water Impact Assessment

Appendix 5

Geomorphological Assessment

Appendix 6

Groundwater Assessment

Appendix 7

Social Impact Assessment

Appendix 8

Ecological Assessment

Appendix 9

Aquatic Ecology Assessment

Appendix 10

Visual Impact Assessment

Appendix 11

Cultural Heritage Assessment

Appendix 12

Traffic Impact Assessment

Appendix 13

Agricultural Assessment

Appendix 14

Economic Assessment

Appendix 15

Phase 1 Environmental Site Assessment