Executive Summary

INTRODUCTION

This *Environmental Assessment* has been prepared by R.W. Corkery & Co. Pty. Limited to accompany an application for project approval by Enhance Place Pty Limited ("the Proponent") to extend its existing coal mining operations at the Pine Dale Coal Mine for a period of three years into an area which incorporates the former un-rehabilitated Yarraboldy Open Cut Mine ("the Project").

The Project, also known as the "Pine Dale Coal Mine - Yarraboldy Extension" is located near Blackmans Flat on the northern side of the Castlereagh Highway, 17km northwest of Lithgow in the Western Coalfields of New South Wales (**Figure A)**.

The application area for the Project is coincident with the boundaries of the "Project Site" which incorporates the existing Pine Dale Coal Mine (approximately 83ha) and the Yarraboldy Extension area (approximately 27ha).

The Project is classified as a Major Project in accordance with the *State Environmental Planning Policy (Major Development) 2005* and, consequently, the Minister for Planning is the approval authority. As a Major Project, it will be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* and an *Environmental Assessment* is required to be submitted to support the application for project approval.

This summary introduces the Proponent, provides relevant background to the Project, and presents an overview of the Project design, operational safeguards and predicted Project-related impacts on the surrounding environment.

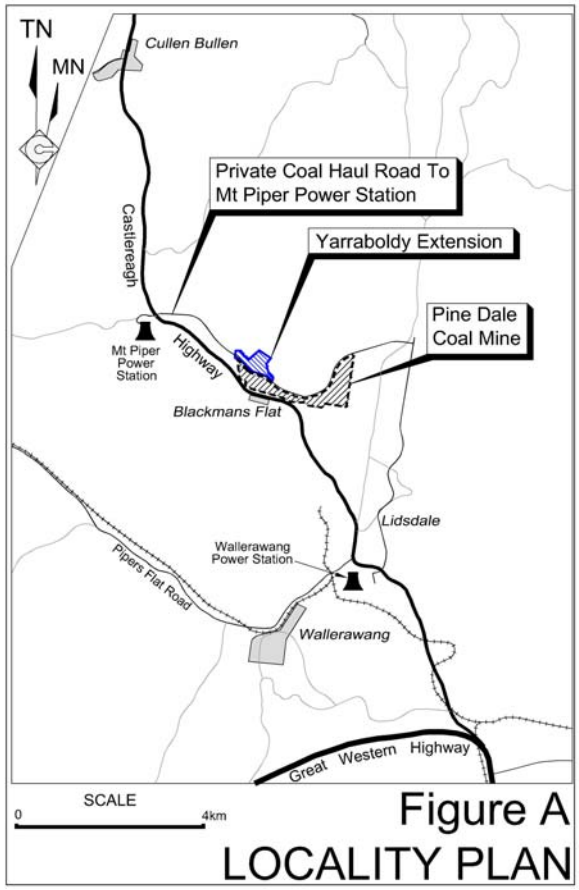


Figure A
LOCALITY PLAN

THE PROPONENT

The Proponent for the Pine Dale Coal Mine – Yarraboldy Extension is Enhance Place Pty Limited. Enhance Place Pty Limited is the owner and operator of the Pine Dale Coal Mine and the adjacent Enhance Place Coal Mine south of the Castlereagh Highway. Mining operations at the Enhance Place Coal Mine have now ceased with rehabilitation effectively completed.

The directors of Enhance Place Pty Limited each have over 40 years operational experience in Australian open cut and underground coal mining operations.

PROJECT OBJECTIVES

The Proponent's principal objectives are to:

- secure approval to ensure the ongoing operation of the Pine Dale Coal Mine and employment of current mine personnel whilst preparing the necessary documentation for a long-term extension;
- maintain the Pine Dale Coal Mine's current Run-of-Mine (ROM) coal production level at up to 350 000tpa;
- continue to supply up to 350 000tpa of coal to customers by public road and Private Coal Haul Road; and
- rehabilitate the previously mined areas within the Yarraboldy Extension Area for return to State Forest capability.

PLANNING CONTEXT

The Project would be developed and operated in accordance with a number of State and regional planning instruments, namely:

- *State Environmental Planning Policy (Major Development) 2005*;
- *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*;
- *State Environmental Planning Policies 33, 44 and 55*; and
- *Drinking Water Catchments Regional Environmental Plan No. 1*.

Under the *Lithgow City Local Environmental Plan 1994* the Project is located within areas zoned Rural 1(a) (General) and Rural 1(f) (Forestry). Mining activities as proposed are permissible activities within these zones, subject to development consent.

BACKGROUND

The Pine Dale Coal Mine currently supplies approximately 350 000tpa of steaming coal to Delta Electricity's Mt Piper Power Station. Coal reserves within the currently approved operations will be exhausted around September 2010. Delta Electricity has expressed an interest in continuing competitively priced long-term contracts with the Proponent for the supply of steaming coal to their two power stations near the Pine Dale Coal Mine, namely Mt Piper and Wallerawang Power Stations.

As the Proponent is committed to the Lidsdale/Blackmans Flat area, it is their preference to explore and develop potential extension options for the current mining operations before seeking to develop alternative coal resources further removed from the Mt Piper and Wallerawang Power Stations. Therefore, in recognition of the current planned completion date for the existing Pine Dale Coal Mine, the Proponent has reviewed their options and proposes to extend their existing mining operations to the north.

Preliminary work to compile an *Environmental Assessment* for a mine extension north of the existing Pine Dale Coal Mine to provide coal supply for approximately a further 20 years commenced in late 2008. However, a number of issues arose which have resulted in delays in compiling the required information for inclusion in an *Environmental Assessment* for this original extension area. This extended the timeframe for potential approval of the original proposed extension beyond when the approved coal resource would be exhausted. In order to ensure the continuation of coal supply after September 2010 without a delay of significant consequence to both the Proponent and its employees, a separate Project Application for a smaller area with fewer environmental and operational constraints has been lodged, namely the Pine Dale Coal Mine - Yarraboldy Extension.

The Yarraboldy Extension area incorporates the former Yarraboldy Open Cut Mine which has a long history of disturbance and has been left effectively un-rehabilitated.

The Proponent views the proposed Yarraboldy Extension as an opportunity to rehabilitate this former disturbance and provide an additional 2½ years of coal supply during which time, the application for the long-term extension can be finalised for consideration and determination. In the event that the proposed long-term extension is not approved, the proposed Yarraboldy Extension would still result in beneficial outcomes for both the community and NSW taxpayers (through the rehabilitation and return to State Forest capability of the former Yarraboldy Open Cut Mine) as well as the Proponent (by extending approved coal reserves by a further 2½ years).

PROJECT DESCRIPTION

Overview

The Project would involve the removal of approximately 800 000t of coal from three coal seams through open cut mining methods over a period of approximately 2½ years, with a further 6 months for final landform creation.

Project Site Layout

The proposed extension would incorporate the following principal components which are shown on **Figure B**.

- An open cut mining area covering approximately 26.5ha incorporating the former un-rehabilitated Yarraboldy Open Cut Mine.
- Construction of an amenity bund set back from the southern boundary of the Yarraboldy Extension area for visual and noise reduction purposes.
- Relocation of the existing Crushing, Stockpiling and Maintenance Area from the existing Pine Dale Coal Mine Site to the Yarraboldy Extension area.
- Operation of the existing crushing plant, if required, in its current location during the site establishment phase. If the existing crushing plant is operated during this time, then the crusher within the Yarraboldy Extension area would not be operated in tandem with the existing crusher.
- Utilisation of the existing lay down area and administration and ablutions area.
- Construction of a new intersection with the existing Private Coal Haul Road crossing.
- Construction and utilisation of various internal access roads, water management structures and some maintenance facilities.

Site Establishment and Construction

Although the Project would be an extension of the existing Pine Dale Coal Mine, approximately the first 6 months of the extended operations would involve a number of site establishment and construction activities. The principal activities would include:

- the construction of the proposed amenity bund using overburden and interburden;
- construction of a new intersection with the Private Coal Haul Road to provide safe ingress / egress; and
- establishment of a new Crushing, Stockpiling and Maintenance Area.

Mining and Crushing Operations

The Yarraboldy Extension area would be developed in a similar method as the current Pine Dale Coal Mine. Mining would involve the sequential removal of vegetation and soil (where present), overburden and interburden above and between each coal seam, coal removal and progressive backfilling and rehabilitation of completed areas.

Vegetation and Soil Removal

Clearing of vegetation would be undertaken on a progressive basis. Larger vegetation would be cleared using a bulldozer and / or excavator pushing with the blade positioned just above the ground to minimise soil disturbance.

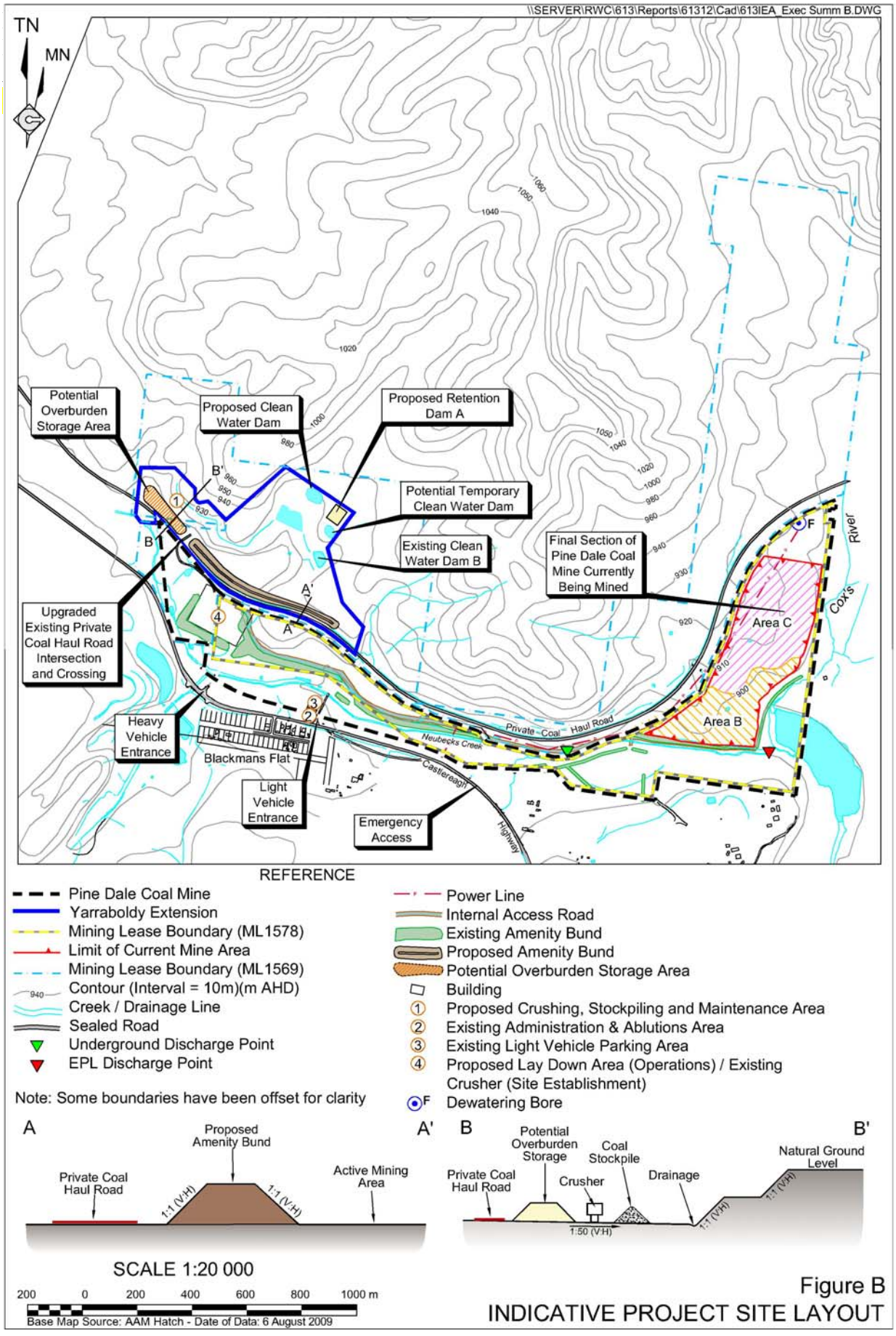


Figure B
INDICATIVE PROJECT SITE LAYOUT

Shrubs and groundcover would be removed with the topsoil during soil removal activities to assist in stabilising the soil.

All available soil material would be recovered from areas to be disturbed using bulldozers. Wherever possible, the soil stripped would be transferred direct to completed areas of the final landform for respreading. Where this is not possible, the topsoil and subsoil would be stockpiled separately, to a height no greater than 2m and 3m respectively.

Overburden / Interburden Removal

The overburden and interburden would be removed using a combination of rip and push and drill and blasting methods. On average, each blast would fragment between 50 000 bank cubic metres (bcm) (approximately 110 000t) and 100 000bcm (approximately 220 000t) resulting in between approximately two and four blasts per month.

Blasted / ripped rock would then be loaded by an excavator into a haul truck and transported to previously mined areas waiting to be backfilled. During the initial 6 months, approximately 175 000m^3 of overburden/interburden would also be utilised to construct the section of the amenity bund above the existing ground level.

In total, approximately 3.5 million bcm of overburden / interburden material would be handled / rehandled throughout the life of the Project.

Coal Mining

As each coal seam is encountered within the open cut mine, the seam would be ripped using a bulldozer and loaded into haul trucks using an excavator or front-end loader. In some instances, limited blasting may be required to condition the coal prior to loading into haul trucks.

Coal recovery would continue at the currently approved rate of 350 000 tonnes per year of Run-of-Mine (ROM) coal to supply 350 000 tonnes of product to customers.

The recovery of ROM coal would generally be undertaken in a sequence of adjoining mining areas. Mining would commence north of the Private Coal Haul Road in the western section of the Yarraboldy Extension area, progressing to the east for the initial 6 month site establishment period. Mining would then progress in a northerly direction for approximately 2 years.

Crushing and Stockpiling

A new Crushing, Stockpiling and Maintenance area would be established during the site establishment period. However, it is noted that, whilst this new area is being established, the existing crushing and stockpiling facilities would continue to be utilised.

Following establishment of the new area, ROM coal would be transported by haul trucks to the ROM coal stockpile. This stockpile would have a capacity of approximately 20 000t. Crushing would be undertaken in the same manner as for the existing operation with ROM coal loaded into a crusher and screening system. Coal would be reduced to <50mm for transportation as product coal.

The crushing plant would operate at a rate of approximately 400t per hour for around 13 days per month producing an average of approximately 30 000t of product coal per month.

Transportation

Up to 100 000tpa of product coal would continue to be transported via the existing heavy vehicle access road and subsequently the public road network. Of this, the majority of the product coal would be transported to customers to the west via the Castlereagh Highway (trucks would turn right out of the heavy vehicle access road).

A small amount of product (up to 30 000tpa) may also be transported east along the Castlereagh Highway (trucks would turn left out of the heavy vehicle access road).

The remaining 250 000tpa of product coal would be transported via the Private Coal Haul Road. In the event that less than 100 000tpa is transported via the public road network, the additional coal may be transported via the Private Coal Haul Road. Road trucks transporting coal via the Private Coal Haul Road would enter and exit the haul road via a proposed new intersection.

Approval is also sought to continue the importation of up to 50 000tpa of boiler ash from the Oberon Timber Processing Works for use in rehabilitation of the Pine Dale Coal Mine and Yarraboldy Extension.

The type of product trucks travelling on the public road network would remain similar to the existing truck configurations with average pay loads in the order of 30t to 35t. Based on 100 000tpa of coal transport and receipt of 50 000tpa of boiler ash, the average number of daily truck despatches would be 18 truck loads (36 movements). However, a maximum of 100 truck loads (200 movements) per day and up to 10 loads (20 movements) per hour could still occur.

The type of product trucks utilising the Private Coal Haul Road would be of similar configurations to those utilising the public road network, however, road trucks with configurations providing a larger payload capacity (such as B-Doubles) may also be utilised with average loads of 50t. Based on 250 000tpa of coal transport, the average number of daily truck despatches via the Private Coal Haul Road would be approximately 18 truck loads (36 movements). Peak truck movements on the Private Coal Haul Road in the order of 100 truck loads (200 movements) per day may also occur.

There is expected to be no change to the volume of light vehicle movements entering and leaving the site via the light vehicle entrance, with an estimated 19 to 22 return light vehicle trips (38 to 44 movements) per day.

Hours of Operation

The hours of operation are not proposed to change from those currently approved, other than for routine maintenance. Routine maintenance is proposed to be undertaken 7 days per week, 24 hours per day, with any maintenance activities principally occurring during the night-time period (10:00pm to 7:00am) provided it is either inaudible or non-intrusive at all surrounding residences. **Table A** presents the proposed hours of operation.

Table A
Proposed Hours of Operation

Activity	Hours of Operation	Day
Land prep, overburden / interburden removal, construction activities	7:00am to 6:00pm 7:00am to 3:00pm	Mon to Fri Sat
Clearing/topsoil and subsoil removal	7:00am to 6:00pm	Mon to Sat
Overburden/interburden / coal removal	7:00am to 6:00pm	Mon to Sat
Drilling	7:00am to 6:00pm	Mon to Sat
Blasting[1]	10:00am to 3:00pm	Mon to Fri
ROM coal haulage	7:00am to 6:00pm	Mon to Sat
Coal Processing	7:00am to 6:00pm	Mon to Sat
Product transportation	7:00am to 8:00pm	Mon to Sat
Maintenance	24hrs	Mon to Sun[2]

1 Blasting may occur outside these times in the event of a misfire or for safety reasons.
2 Maintenance during night time hours to be limited to activities that are either inaudible or non-intrusive to surrounding residences.

Employment

The Pine Dale Coal Mine currently employs 12 full-time personnel on site and provides an additional seven full-time equivalent positions for truck drivers.

With approval of the Yarraboldy Extension, these employees would be retained. Additional contract personnel would also continue to be brought onto site from time to time to perform specific short-term roles such as equipment maintenance.

Rehabilitation and Final Landform

The Proponent would adopt a progressive approach to the rehabilitation of areas no longer required for operations. A significant component of the rehabilitation would be the rehabilitation of the former Yarraboldy Open Cut Mine. The aim of the final landform would be to re-create the features and general characteristics similar to the existing landform including the reconstruction of drainage lines generally in the locations of the pre-mining drainage.

The general rehabilitation procedures for the Yarraboldy Extension would include the following activities.

- Overburden / interburden placement and shaping.
- Subsoil and topsoil replacement.
- Drainage installation.
- Placement of salvaged habitat features (such as fallen logs / tree trunks).
- Revegetation with native species.

These activities would be undertaken in accordance with a *Flora, Fauna and Rehabilitation Management Plan*.

At the end of the Project life, in the event future mining operations are unlikely to proceed, all buildings would be dismantled and removed from site for re-use elsewhere. The crushing facility would be dismantled and the amenity bund pushed out to blend with the final landform.

As a significant part of the extension area is located within the Ben Bullen State Forest, the final land use for the rehabilitated area would be for vegetation conservation and the use of Industry & Investment NSW – Forests.

The area within the existing Pine Dale Coal Mine would be returned to pasture suitable for agricultural purposes consistent with the currently approved rehabilitation plan and landholder preferences.

ISSUE IDENTIFICATION AND PRIORITISATION

In order to undertake a comprehensive *Environmental Assessment* of the Project, appropriate emphasis needs to be placed on those issues likely to be of greatest significance to the local environment, neighbouring landowners and the wider community. These issues (and their potential impacts) were identified through a program of community and government consultation, preliminary environmental studies and literature review. This was followed by an analysis of the risk posed by each potential impact in order to prioritise the assessment of the identified environmental issues within the *Environmental Assessment*.

Consultation

Consultation with the local community involved: distribution of a newsletter and follow-up telephone calls and interviews, when requested.

Consultation with government agencies has been ongoing for some time with liaison involving correspondence, discussions and for some site meetings. Some government agencies participated in a PFM for the Project. Individual meetings have been held with the Mayor and General Manager of Lithgow City council.

Issue Prioritisation

Considering the environmental issues raised throughout the consultation process, a review of the Project design and local environmental features was undertaken to identify risk sources and potential environmental impacts for each environmental issue. An analysis of risk for each potential environmental impact was then completed, with a risk rating assigned to each impact based on likelihood and consequence of occurrence, ie. in the absence of any mitigation measures. Through a review of the allocated risk

ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to guide the depth of coverage within the *Environmental Assessment*.

Based on the issues identified and the risk ratings allocated to the potential environmental impacts of these, the following order of priority of environmental issues has been determined.

1. Groundwater
2. Surface Water
3. Ecology
4. Aboriginal Heritage
5. Transportation
6. Noise
7. Blasting
8. Air Quality
9. Visibility
10. Soils and Land Capability
11. Socio-Economic Setting

ENVIRONMENTAL SETTING

The Project Site is located in the eastern margin of the Central Tablelands within a broad valley bounded by the Great Dividing Range to the west and Newnes Plateau to the east.

Elevations within the proposed extension area range from approximately 945m AHD in the northwestern corner down to 895m AHD at the lowest point within the former Yarraboldy Open Cut Mine.

On a regional scale, the Project Site lies within the Upper Coxs River catchment, which in turn is part of the greater Warragamba Dam Catchment. On a local scale, the Yarraboldy Extension area is located within the Neubecks Creek catchment, a perennial tributary of the Coxs River. No permanent waterways are located within the proposed extension area.

Twelve residences are located within approximately 500m of the extension area (see **Figure C**). Land uses in the surrounding area include residential, State Forest and nature conservation, livestock and grazing, coal mining and a waste facility.

EXISTING ENVIRONMENT AND POTENTIAL IMPACTS

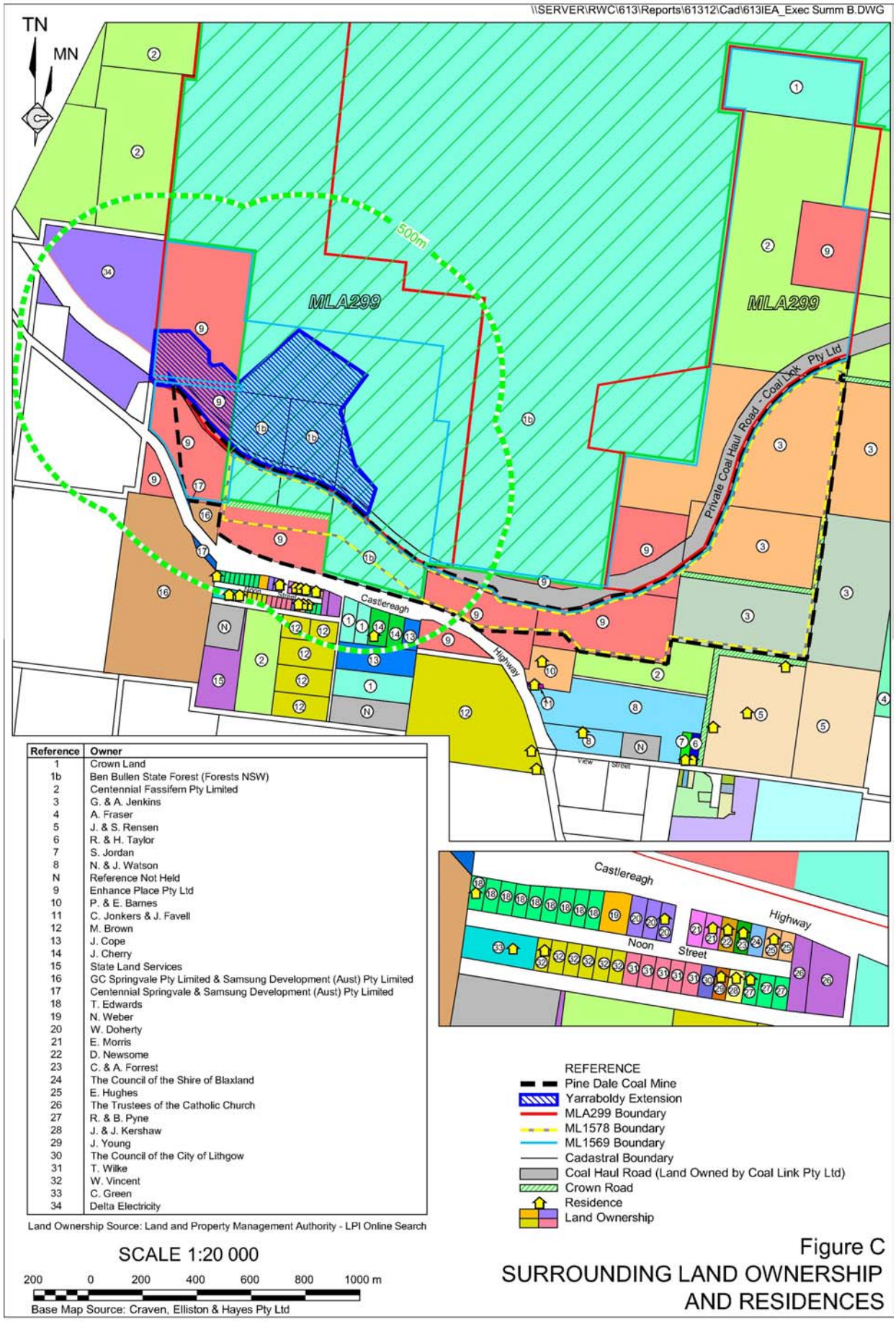
The components and features of the existing environment on and around the Project Site have been studied in detail and the Project designed to avoid or minimise impacts on that environment. A brief overview of the main components of the surrounding environment, the proposed safeguards and the assessed level of impact are set out below.

Groundwater

The main groundwater source within the Project Site is the water stored in the former Wallerawang Colliery underground workings. It has been estimated that approximately 8 800ML of water is stored within these workings. The former Wallerawang Colliery underground workings underlay the proposed Yarraboldy Extension footprint area and extend in all directions from the Project Site.

The main aquifer within the Project Site is the Lithgow Seam, which has secondary permeability due to fracturing of the coal seam. The other adjacent coal seams are also described as aquifers, however, their groundwater potential is lower than that of the Lithgow Seam. The overlying Triassic sediments have a high permeability where they are fractured and therefore may contain groundwater.

Groundwater levels within the Lithgow Seam follow the dip of the seam except where they cross the boundaries between the former Wallerawang Colliery underground workings. Groundwater levels within the Lidsdale Seam also follow the



Reference	Owner
1	Crown Land
1b	Ben Bullen State Forest (Forests NSW)
2	Centennial Fassifern Pty Limited
3	G. & A. Jenkins
4	A. Fraser
5	J. & S. Rensen
6	R. & H. Taylor
7	S. Jordan
8	N. & J. Watson
N	Reference Not Held
9	Enhance Place Pty Ltd
10	P. & E. Barnes
11	C. Jonkers & J. Favell
12	M. Brown
13	J. Cope
14	J. Cherry
15	State Land Services
16	GC Springvale Pty Limited & Samsung Development (Aust) Pty Limited
17	Centennial Springvale & Samsung Development (Aust) Pty Limited
18	T. Edwards
19	N. Weber
20	W. Doherty
21	E. Morris
22	D. Newsome
23	C. & A. Forrest
24	The Council of the Shire of Blaxland
25	E. Hughes
26	The Trustees of the Catholic Church
27	R. & B. Pyne
28	J. & J. Kershaw
29	J. Young
30	The Council of the City of Lithgow
31	T. Wilke
32	W. Vincent
33	C. Green
34	Delta Electricity

Land Ownership Source: Land and Property Management Authority - LPI Online Search

Figure C
SURROUNDING LAND OWNERSHIP AND RESIDENCES

dip of the seam and form one aquifer at the Lithgow-Lidsdale convergence line. The Irondale Seam outcrops at the northern boundary of the proposed Yarraboldy Extension with the groundwater flow in this aquifer moving towards the east.

Water from the Lithgow Seam and the former Wallerawang Colliery void has similar ion chemistry, is typically hard to very hard and dominated by chloride/sulphate anions and calcium/ magnesium cations. Groundwater from the Lithgow Seam is slightly acidic to alkaline and has the widest pH range of between 6.21 and 9.00. The water from the former Wallerawang Colliery void is generally neutral with a pH in the range of 6.63 to 7.21.

The groundwater analytical model has assessed the potential impacts of dewatering the proposed Yarraboldy Extension during mining and the impacts of groundwater recovery post mining. During the first 18 months of the Project there would be no groundwater interception, during which time rainfall recharge may provide sufficient water for operational requirements with pit dewatering commencing in the second year of the Project.

During the last 12 months of the Project, mining would intercept groundwater stored in the former Wallerawang Colliery underground workings, however, the total volume of groundwater intercepted may be insufficient for operational requirements. Therefore, during this time, additional water would need to be sourced from the former Wallerawang Colliery underground workings that have not been intercepted by the Project.

Groundwater drawdown in the Lithgow Seam (former Wallerawang Colliery void) would occur to the north only, as the seam outcrops to the south. The drawdown is predicted to be negligible as the Lithgow Seam dips northeasterly and its elevation at the northern boundary of the proposed Yarraboldy Extension would be below the groundwater elevations within the extension footprint.

No drawdown would occur in the Lidsdale and Irondale Seams as both seams outcrop within the northern areas of the proposed Yarraboldy Extension area and only minor seepage is expected.

No adverse impacts are predicted on adjacent licensed groundwater users or basic landholder rights. The flow and water quality within the Neubecks Creek and groundwater dependent ecosystems would not be affected by the proposed Yarraboldy Extension.

Pre-mining groundwater equilibrium would be maintained by recharge to the proposed Yarraboldy Extension area and discharge down-dip to the old Wallerawang Colliery underground workings. The discharge would be controlled by the in-situ permeability of the Lithgow Seam down dip of the former Wallerawang Colliery underground workings.

The post mining net groundwater recharge rate would be approximately 17m^3/d higher than the current rate and recovery to pre-mining equilibrium would occur after 3 years following the cessation of operations. The recovery has been calculated based on the average rainfall conditions of the area and a 5% groundwater recharge to backfilled material. It would take a further 22 years (approximately) to fully saturate the old Wallerawang Colliery void, where full saturation is reached to the top of the Lithgow Seam at the northern boundary of the Yarraboldy Extension area. The new equilibrium would be established with a higher rate of evapotranspiration from post-mining revegetation of the pit backfill.

Surface Water

The Project Site is located in the Neubecks Creek catchment which is a sub-catchment of the Upper Coxs River, which in turn is

part of the greater Warragamba Dam catchment. Natural drainage within the Yarraboldy Extension area is generally to the south and southeast following the natural topography toward the receiving waters of Neubecks Creek.

Water quality data for Neubecks Creek show a pH range of 6.8 to 7.3, low electrical conductivity values (300 to 1400uS/cm), very low total suspended solids (<20mg/L), average sulphate ion concentrations and variable filterable iron concentrations.

The existing water management structures within the Yarraboldy Extension area comprise two dams and a clean water diversion bank which captures the vast majority of clean water generated from the local catchment. Hence, it is unlikely that significant volumes of clean water currently would flow into Neubecks Creek from the proposed extension area. Water from the existing Pine Dale Coal Mine is currently pumped to the former Wallerawang Colliery underground workings.

It has been assessed that, by implementation of appropriate water management measures, the impact on surrounding water quality and quantity would be minimal. Management of water flows would assist in separating and restoring clean water flows (that are currently reporting to the underground workings) to Neubecks Creek. This would occur through the construction of a series of clean water diversion bunds and removal of clean water dams within the natural system during rainfall events to allow flows through the system. Additionally, by implementing and maintaining the proposed clean and dirty water management measures for the Project, it is anticipated that there would be neutral or beneficial impact upon surface water.

Results from the indicative annual site water balance prepared for the Project, indicate that the Yarraboldy Extension area would operate during average and dry years as a net water-deficit site (water user). The deficit would be met by extracting groundwater from the former Wallerawang Colliery underground workings. In 'wet' years, the site may be a net water generator (surplus) and water management options would include the discharge of water off-site via licensed discharge points, when required, following treatment in the proposed sedimentation ponds.

The continuance of the current surface water monitoring program would ensure that water management measures implemented as part of the Project would function as per the proposed design criteria, and that, where surface water requires off-site discharge, water quality would comply with water quality goals nominated in the Environment Protection Licence (EPL4911). A *Site Water Management Plan* to be prepared following receipt of project approval would incorporate the key concepts and strategies proposed for the management of clean water and dirty water noted above.

Given the proposed management controls and structures to be implemented across the Project Site, it is unlikely that the Project would have significant impact on the quantity and quality of water discharging into Neubecks Creek, and thus on the Warragamba Dam Catchment and Sydney's water supply.

Flora

During flora surveys for the Project, four vegetation communities were recorded, two being remnant native vegetation whilst the remaining two are variously disturbed by previous agricultural and mining activity. These communities are:

- Community 1 Stringybark – Scribbly Gum Forest;
- Community 2 Mountain Gum Forest;
- Community 3 Open Cleared Lowlands; and
- Community 4 Disturbed Lands.

None of these communities represent an Endangered Ecological Community (EEC) nor were any threatened flora species, endangered populations or critical habitat recorded during the survey.

Based on database searches, five threatened species, two critically EECs, 38 EECs, three Vulnerable Ecological Communities, and two endangered populations listed under the *Threatened Species Conservation Act 1995* (TSC Act) have previously been recorded in the area and have potential to occur within the extension area.

Similarly, under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) eight threatened species and two Critically EECs have the potential to occur within the extension area.

It has been assessed that the Project would not significantly impact on any threatened flora species, EECs, endangered flora populations or critical habitat. A referral under the EPBC Act would not be required.

Fauna

During fauna surveys for the Project, a total of 73 species of vertebrate fauna were identified including four species of frogs, six reptiles, 18 mammals and 45 species of birds. Three are listed as vulnerable under the TSC Act (Scarlet robin, Gang-gang cockatoo and Grey-headed flying-fox) and one as vulnerable under the EPBC Act (Grey-headed flying-fox).

An additional six species of insectivorous bats were identified with "possible" or "probable" confidence by analysis of calls recorded by Anabat call detectors. Four are listed as vulnerable under the TSC Act (Large-eared pied bat, Eastern bent-wing bat, Eastern cave bat and Yellow-bellied sheath-tail bat) and one as vulnerable under the EPBC Act (Large-eared pied bat).

Based on database searches, 54 threatened or migratory fauna species and one preliminary listed threatened species have been recorded, predicted or are considered to have some potential to occur within the extension area. Of these, 39 are considered to have a moderate to high possibility of occurring within the extension area.

No endangered fauna populations or critical habitat have been identified as occurring or likely to occur. It was also confirmed that the extension area is not potential Koala habitat as defined by *State Environment Planning Policy 44*.

With the implementation of the proposed safeguards, it has been assessed that the Project is unlikely to affect any threatened or migratory species in such a way that would result in a significant impact under the considerations provided by the *Environmental Planning and Assessment Act 1997* or the EPBC Act. Therefore, a referral under the EPBC Act would not be required. With the implementation of a biodiversity offset, the Project's biodiversity values would also be maintained in the short term and improved in the long term.

Aboriginal Heritage

A search of the Aboriginal Heritage Information Management System (AHIMS) Site Register identified 33 sites within the general area surrounding the Project Site. None of the sites occur within the Yarraboldy Extension area. A detailed site survey identified two sites, both open artefact scatters, on cleared spur tops overlooking the Wangcol Creek valley were within the original proposed boundary of the Yarraboldy Extension. However, the boundary was amended to avoid the two artefact scatter site, and now they lie outside of final the Yarraboldy Extension area boundary.

In the absence of any archaeological artefacts (Aboriginal and European) identified within the proposed extension area, the impacts of the Project on cultural and archaeological significance and research potential would be negligible. In view of this finding, there would not be any need to implement any special design or operational safeguards in the Project to minimise impacts. However, the Proponent would continue to ensure that they will comply with the obligations under Sections 88 and 90 of the *National Parks and Wildlife Act 1974*.

Transportation on Public Roads

The traffic and transportation assessment considers both existing and future ambient traffic levels and the proposed maximum traffic associated with the proposed extension. It has been assessed that the Pine Dale Coal Mine's current heavy vehicle and light vehicle entrances and their intersection with the Castlereagh Highway are both suitable and preferred for the proposed production and transport rates throughout the entire three year life of the Project.

Both heavy and light vehicles exiting the mine would have a minimal impact on the traffic on the Castlereagh Highway and the change to the local traffic environment would remain within accepted RTA standards. Therefore, from a traffic safety and transport perspective, there is no reason why the proposed transport rates onto the Castlereagh Highway should not be delivered through the existing intersections.

Noise

The noise assessment has shown that the site establishment scenario, incorporating construction of the noise amenity bund and general mining operations, is predicted to comply with the relevant noise criteria with the exception of minor ($\leq$2dB(A) exceedances at two residences. These minor exceedances are related to the final shaping of the landform within the northern section of the existing mine.

Operational noise levels are predicted to comply with the Project specific noise levels at all surrounding residences.

Product loading and transportation within the Project Site during the evening period (6:00pm and 8:00pm) is predicted to comply with relevant noise criteria under calm and prevailing weather conditions and maximum hourly traffic movements at all locations with the exception of two residences. Exceedances of up to 4dB(A) and 2dB(A) are predicted at these residences, however, noise levels from product truck movements on site are already significantly below acceptable road traffic noise levels and are unlikely to be distinguishable from the existing road traffic movements on the Castlereagh Highway. Also, the existing operation is already approved to transport at the proposed traffic volumes and, to date, no complaints have been received about noise relating to this activity.

Night-time maintenance activities are predicted to comply with operational and sleep disturbance noise goals at all assessed locations.

Road traffic noise modelling indicates that predicted future road traffic noise levels associated with the Project are likely to meet the road traffic noise criteria.

Blasting

The Proponent, with the assistance of blasting specialists, has designed their blasting practices for the Pine Dale Coal Mine such that all blasts comply with relevant blast criteria. The Proponent intends to adopt similar practices, with refinements, to optimise the fragmentation from blasting. Blasting is proposed on between two and four occasions per month. Blast designs would be varied to accommodate the distances between the closest residence(s) and the blast site.

Air Quality

Dust generating activities associated with the Project have been identified and quantified utilising approved dispersion modelling. The modelling indicates that cumulative off-site, annual average Total Suspended Particulates, PM_{10} and dust deposition levels and 24-hour average PM_{10} concentrations as a result of the Project are predicted to comply with relevant ambient air quality criteria at the nearest sensitive receptors.

Ongoing monitoring of 24-hour average PM_{10} concentrations by the Pine Dale Mine High Volume Air Sampler (HVAS), which is located adjacent to the current mine office, would provide data on the site's compliance with the 24-hour average PM_{10} criterion. It is considered the HVAS is located in the worst affected area predicted by the modelling, hence no changes to the monitoring network are proposed.

It is noted that existing operations have been occurring without causing exceedances of either PM_{10} or deposited dust criteria. However, if elevated concentrations were recorded during the life of the Project, additional mitigation measures (such as increased watering rates, or modification of site activities during windy conditions) would be implemented.

A greenhouse gas (GHG) assessment was also completed. The total GHG emissions for the Project would represent 0.06% of the NSW GHG total emission inventory for 2007, and 0.02% of the Australian national emissions for 2007.

Visual

Based on cross-sections generated from topographic plans and observations from surrounding vantage points, it is considered that the operations within the Yarraboldy Extension area would generally not be visible from surrounding residences, except during the construction of the amenity bund and in the very late stages of the Project.

The principal existing components / activities that would continue to be visible would be the existing site office and vehicle movements on the heavy vehicle access road. It is considered that these components / activities would not be inconsistent with the existing visual amenity and that, with the use of the Private Coal Haul Road, the 'visual intensity' of product transportation activities would decrease from those currently experienced. It is also noted that, the visual amenity of the current mining areas would continue to improve as rehabilitation and revegetation activities are completed and vegetation establishes.

Overall, it is assessed that the nature and scale of the proposed activities would generally be consistent with the scale and character of developments in the local area. Furthermore, following the completion of the Project and rehabilitation activities, it is considered that the visual character of the landscape would in fact improve with the return of the former Yarraboldy Open Cut Mine to a forested landscape.

Soils, Land Capability & Agricultural Suitability

Two Soil Mapping Units (SMUs) have been identified within the extension area:

i) SMU 1 – Soils of the lower slopes, mid-slopes and upper slopes and crests; and
ii) SMU 2 – Soils of the drainage depressions and associated terraces.

The physical and chemical properties of both SMUs are generally stable, have an overall moderate erodibility, low dispersibility, are non-saline and exhibit pH levels in the range 5.5 to 7.0.

The use of appropriate soil stripping, handling and stockpiling procedures, together with appropriate erosion controls would result in a minimal impact to soils within the Yarraboldy Extension area.

The heavily disturbed lands within the Project Site are land capability Class M (Mining) while the lesser disturbed areas (mainly within Ben Bullen State Forest) are classified as Class VII lands.

Following the cessation of mining, the rehabilitation of the mined areas would seek to recreate a landform consistent with Class VII land capability.

Bushfire

A *Bushfire Management Plan* would be developed consultation with the local Rural Fire Service and NSW Forests to ensure that the appropriate management and response procedures are implemented to reduce the risk of bushfire hazard and subsequently the potential safety risk to employees and the local community as well as the potential loss of timber resource within the wider Ben Bullen State Forest. In addition, the following management measure would be adopted to reduce the risk of bushfire.

- All equipment on site would continue to be equipped with adequate and fully operational fire suppression equipment.
- All employees would be trained in the proper use of fire fighting equipment held on site.
- Water would be especially set aside for fire fighting on site and a water cart made available for fire fighting purposes.
- A protocol would be developed similar to that adopted for State Forests for restricting work in forested areas during high fire danger periods of the bushfire season.
- NSW Forests and the local Rural Fire Service would be consulted prior to each bushfire season.
- Mine site fire fighting equipment would be made available to the local Rural Fire Service and/or State Forests if required in the event of a bushfire in the land surrounding the Project Site.
- Suitable firebreaks would be developed and maintained at the edge of forested areas within the Project Site.

With the above mitigation measures adopted, it is considered that the bushfire hazard associated with the Project would be acceptable and that the proposed Yarraboldy Extension would not significantly contribute to raising the local bushfire hazard.

Socio-economic

The Project would continue to result in the following range of socio-economic benefits to the local and wider community.

- Continued direct employment for approximately 12 people on site and 7 truck drivers during operation of the Project.
- Injection of approximately $2.2 million into the local and regional economy through purchase of consumables and wages etc.
- Payment of approximately $2.9 million into the State and national economy through royalties (based on 800 000t of coal) and other taxes.
- Supply of locally-sourced coal for two of NSW's important power stations.
- Ongoing support for training and education of employees.
- Rehabilitation of the former Yarraboldy Open Cut Mine and return of the area to State Forest.

It is acknowledged that the Project would have some adverse impacts on a limited number of surrounding residences, principally associated with noise emissions. However, all reasonable and feasible measures to minimise those impacts would continue to be undertaken.

Additionally, the Proponent would continue to proactively consult throughout the Project with those residents most likely to be adversely affected and engage the community surrounding the Project through the use of an "open door" policy.

PROJECT EVALUATION AND JUSTIFICATION

The Pine Dale Coal Mine – Yarraboldy Extension has been evaluated and justified principally through consideration of its potential impacts on the environment and potential benefits to the local and wider community.

An evaluation of the Project has been undertaken by firstly re-assessing the risks posed to the local environment by project-related activities following the implementation of all operational controls, safeguards and/or mitigation measures, and secondly through consideration of the principles of ecologically sustainable development. This evaluation has found that, with the implementation of the proposed operational controls, safeguards and/or mitigation measures, the residual risk posed by each possible environmental incident or impact was reduced from its original level and, with limited exception, classified as either moderate or low and therefore acceptable.

The Project has also addressed each of the sustainable development principles. It has been concluded that the Project achieves a sustainable outcome for the local and wider environment.

The Project has also been justified in terms of a wide range of biophysical, social and economic issues. These impacts have been justified in terms of the low risk of environmental impacts and the positive economic and social benefits that would result for the local and regional community and for the State.

CONCLUSION

The Project has, to the extent feasible, been designed to address all issues raised by the local community and all levels of government as well as the principles of ecologically sustainable development. The Project provides for the mining of an important resource and for ongoing generation of employment opportunities and economic stimulus to the local, regional and State economy. The post-mining landform would also result in the rehabilitation of the former Yarraboldy Open Cut Mine which would be returned to State Forest capability resulting in a net land use benefit.

In light of the conclusions included throughout the *Environmental Assessment*, it is assessed that the Project could be constructed and operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives and reasonable community expectations.