



July 2013

## ENVIRONMENTAL IMPACT STATEMENT

# Angus Place Mine Extension Project - Visual Impact Assessment

**Submitted to:**  
Centennial Coal Company Limited

REPORT



**Report Number.** 127623060\_123\_R\_Rev2





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## GLOSSARY

3-D	Three dimensional
APC	Angus Place Colliery
APMEP	Angus Place Mine Extension Project
CGIAR	Consultative Group on International Agricultural Research
Centennial	Centennial Coal Pty Ltd
DEM	Digital Elevation Model
ESRI	Environmental Systems Research Institute
GIS	Geographic Information Systems
Golder	Golder Associates Pty Ltd
GLVIA	Guidelines for Landscape and Visual Impact Assessment
LI	Landscape Institute
MOP	Mining Operations Plan
PAA	Project Application Area
VSA	Visual Study Area



## 1.0 INTRODUCTION

Golder Associates (Golder) has been commissioned by Centennial Angus Place Pty Ltd (Centennial Angus Place) to undertake a Visual Impact Assessment (VIA) for the proposed Angus Place Mine Extension Project (APMEP).

Centennial Angus Place proposes to extend its mining operations, using longwall mining techniques, to the east of its existing operations at Angus Place Mine, located 15 km northwest of the city of Lithgow, NSW (**Figure 1**). New surface infrastructure in the Newnes State Forest will be required to support the ongoing development of Angus Place Mine. APMEP will continue to use the existing infrastructure at the Angus Place pit top and the Newnes Plateau.

This Visual Impact Assessment (VIA) is focused on existing pit top infrastructure, existing infrastructure at Newnes Plateau and proposed surface infrastructure at the APMEP. In addition, the visual impact resulting from the rehabilitation at the end of the mine life will be assessed.

## 2.0 OBJECTIVES

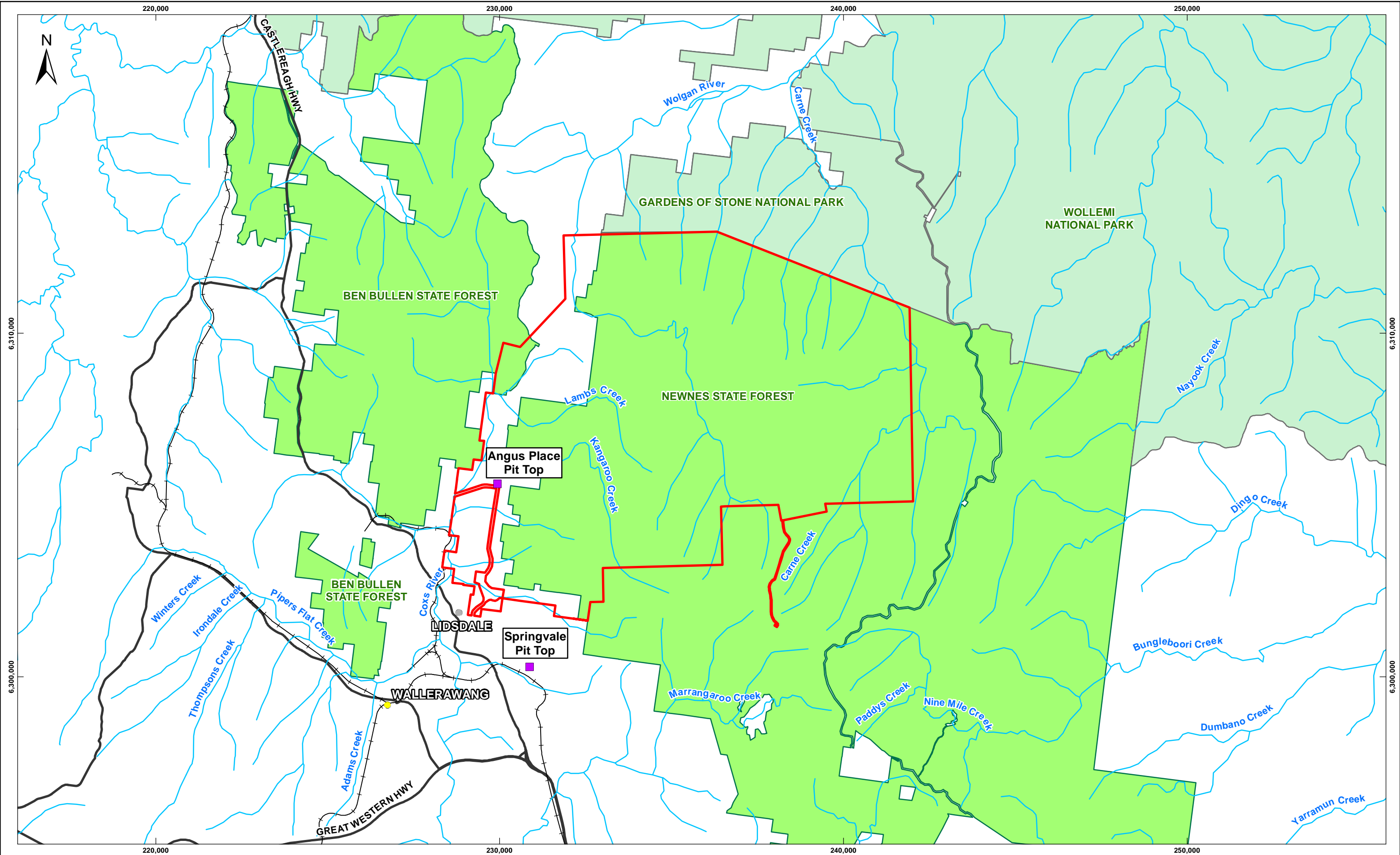
A VIA refers to a systematic analysis of potential impacts upon viewing areas as a result of a development.

The principal objectives of the APMEP VIA are to:

- Describe the existing aesthetic environment of the Project Application Area (PAA);
- Identify sensitive receptors, and take photographs from these receptors;
- Assess the potential visual impacts of the proposed and existing infrastructure and rehabilitation form for each identified receptor; and
- Provide recommendations to mitigate potential effects on visual amenity.

In fulfilling these objectives, the Director-General's requirements for the APMEP relating to visual amenity are also addressed. These requirements are:

- *A detailed assessment of the potential visual impacts of the development on private landowners in the surrounding area as well as from key vantage points in the public domain, in particular, those available to recreational users from State forests, State conservation areas and national parks; and*
- *A detailed description of the measures that would be implemented to minimise the visual impacts of the Development*



**LEGEND**

- Project Application Area
- Village
- Town
- Rail
- Main Road
- National Park
- State Forest
- Watercourse

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### Figure 1: Site Location Map

PLOTFILE No.	
Centennial Coal Angus Place	
DRG No. 1	A3



### 3.0 METHODOLOGY

This VIA is based on the “Guidelines for Landscape and Visual Impact Assessment (GLVIA) published by the Landscape Institute” (LI 2002). The chronology of the VIA methodology is:

1. The establishment of visual study area based on likely views of the project area;
2. The determination of sensitive receptors;
3. A photo survey;
4. An assessment of visual sensitivity and magnitude of visual change; and
5. As assessment of impact significance and formulation of mitigation measures.

The magnitude of change in visual amenity, as set out in **Table 1** (based on Landscape Institute, 2002) results from the scale of change in the view with respect to the loss or addition of features in the view and changes in the view composition. Important factors to be considered include the proportion of the view occupied by the proposed infrastructure, distance, and duration of the view.

**Table 1 Criteria for Assessing the Magnitude of Visual Change**

<b>Substantial</b>	<b>Adverse</b> A considerable deterioration in the existing view. A change in the view that has a dominating or overbearing influence. The proposals represent a substantial detracting from the overall character or composition of the scene.
	<b>Beneficial</b> A considerable improvement in the existing view. The proposal is the prominent feature and there is large scale or substantial improvement to the overall character or composition of the scene.
<b>Moderate</b>	<b>Adverse</b> A noticeable deterioration in the existing view. A major change in the view that has a defining influence on the overall character or composition of the scene. The proposal forms a visible and immediately apparent new feature that results in a noticeable deterioration in the existing view.
	<b>Beneficial</b> A noticeable improvement in the existing view. A major change in the view that has a defining influence on the overall character or composition of the scene. The proposal forms a visible and immediately apparent new feature that results in a noticeable improvement in the existing view.
<b>Slight</b>	<b>Adverse</b> A perceptible deterioration in the existing view. Some measurable change where the proposal constitutes a subtle deterioration in the overall character or composition of the scene.
	<b>Beneficial</b> A perceptible improvement in the existing view. Some measurable change where the proposal constitutes a subtle improvement in the overall character or composition of the scene.
<b>Negligible</b>	<b>Adverse</b> A barely perceptible deterioration in the existing view. The proposals result in a perceptible detracting from the overall character or composition of the scene.
	<b>Beneficial</b> A barely perceptible improvement in the existing view. The proposal results in very minor improvement to the overall character or composition of the scene.





No change	No discernible deterioration or improvement in the existing view.
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The results of the magnitude of visual change represent the overall change between all of the proposed APMEP elements and the existing landscape. The magnitude of visual change for the sensitive receptors are compared to the viewer sensitivity as shown in **Table 2** (based on Landscape Institute, 2002), resulting in the significance of visual effects of the sensitive receptor and for the project.

**Table 2 Significance of Visual Effects**

Visual Sensitivity	Magnitude of Change					
		Substantial	Moderate	Slight	Negligible	No Change
	High	Major	Major / Moderate	Moderate	Moderate / Minor	None
	Medium	Major / Moderate	Moderate	Moderate / Minor	Minor	None
	Low	Moderate	Moderate / Minor	Minor	Minor / Negligible	None

## 4.0 PROJECT ELEMENTS

The visual elements of the APMEP are in two distinct regions; the pit top and the Newnes Plateau. These two regions have very different visual characteristics and receptors, and accordingly are described separately in the following sections. Refer to **Figure 2**.

### 4.1 Pit Top

Key visual components of existing infrastructure at the Angus Place pit top are:

- Mine entries for equipment, personnel and coal;
- Coal handling facilities, conveyors, stockpile and truck bins;
- Workshop and store;
- Fuel, oil, solcenic and lubricant stores;
- Air compressors and electrical switchyard;
- Bathhouse;
- Surface water management systems;
- Sewage treatment plant;
- Administration buildings and car parks; and
- Ventilation facilities.

As part of current operations, ROM coal is transported underground from the longwall face to the ROM stockpile at the pit top by a high capacity conveyor system. Coal is sized and dispatched using trucks from the site. All operational management of coal transport from the pit top is to be transferred to the Western Coal Services (WCS) project currently being assessed by the Department of Planning and Infrastructure



(DP&I) (SSD 12\_5579). Therefore the visual impact of the coal transport system has not been assessed in this report.

The Project will not change the existing operations and infrastructure at the pit top.

## 4.2 Newnes Plateau

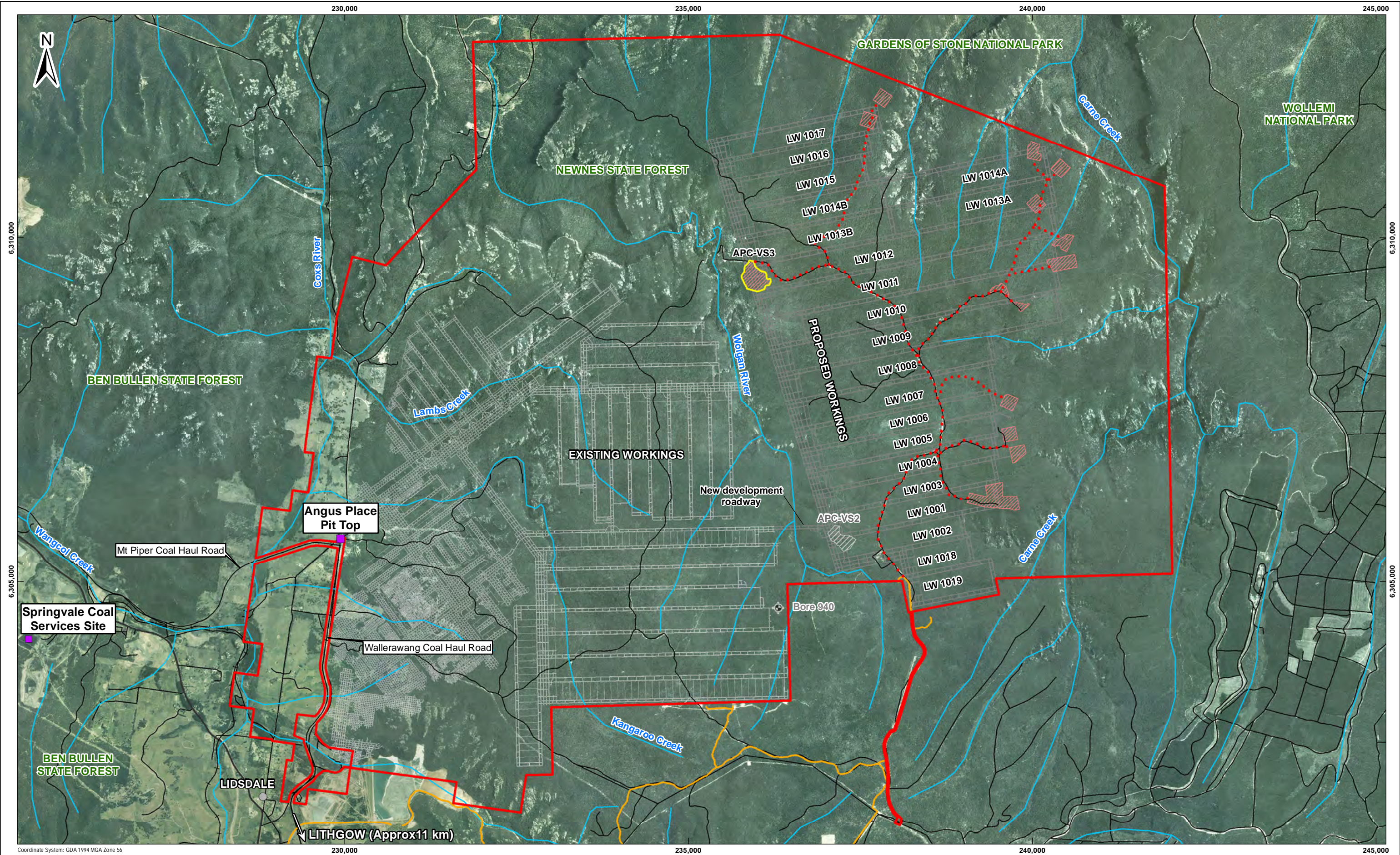
Key components of existing infrastructure on Newnes Plateau includes:

- Ventilation facilities;
- Dewatering facilities;
- Services; and
- Access.

Proposed infrastructure will include:

- Construction and operation of Ventilation Shaft 3 (APC-VS3);
- Construction and operation of seven dewatering bore facilities;
- Upgrade and extension to the existing access tracks from Sunnyside Ridge Road to the dewatering borehole facilities and APC-VS3; and
- Power lines and water pipelines would be buried within a 10m infrastructure corridor to be established adjacent to the access track.





**LEGEND**

- Project Application Area
- Village
- Rail
- Main Road
- Street / Track
- Watercourse
- Existing SDWTS Pipeline
- Existing Dewatering Facility
- Existing Ventilation Facility (APC-VS2)
- Environmental Study Area
- Ventilation Facility (APC-VS3)
- Infrastructure Corridor
- Existing Workings
- Proposed Workings

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**Figure 2:  
Proposed and Existing  
Infrastructure**

PLOTFILE No.

Centennial Coal  
Angus Place

DRG No. 2

**A3**





## 5.0 VISUAL CHARACTER

### 5.1 Pit Top

The western portion of the PAA adjoins both sides of Wolgan Road, which is aligned in a generally north-south direction, providing access to the enclosed Wolgan Valley and its various recreational and agricultural areas. The lands east of the pit top, rapidly merge into relatively undisturbed woodland and forest, while to the area to the west and through the valley is predominantly cleared grazing land.

The pit top, while obvious close by from Wolgan Road, is well shielded from view from most areas. It is essentially enclosed on three sides, and only opens to clear views from the west before hills on the other side of the narrow valley intervene. There are several houses to the south west ranging from 1000m to 2000m from measured from the centre of the pit top infrastructure. Further to the south (approximately 3000m from the pit top) is the urban area of Lidsdale. There is predominantly grazing land with occasional farm house along Wolgan Road to the north of the pit top.

The dominant visual features in the pit top area is grazing land in the valley floor surrounded by forested hills with occasional views of the pit top infrastructure.

### 5.2 Newnes Plateau

The PAA is almost entirely within the Newnes Plateau (**Figure 2**) which is mostly undisturbed bushland comprising various woodland and forest types, interspersed with numerous swamps and watercourse, although these are less visible as the forest tracks tend to be on ridges. There are approximately 25,000ha of pine plantation adjacent to the PAA.

The Newnes Plateau is interspersed with major and minor forestry tracks, numerous lookouts, several picnic areas, camping grounds and relatively small scale mine infrastructure such as overhead powerlines, monitoring bores, dewatering bore facilities and ventilation facilities.

Excellent vistas can be had from several lookouts, although these are generally only accessible by 4wd. The dominant visual feature of both the mined area and the Project area is one of relatively undisturbed natural bushland. One of the major tourist attractions on the plateau is the Glowworm Tunnel, which is an artefact of past oil shale mining and processing. It cannot be accessed directly from the PAA, and most visitors to the PAA and Glowworm Tunnel would travel from the south along Old Bells Line of Road or Glowworm Tunnel Road, which traverses both native woodland and pine plantations.

## 6.0 VISUAL STUDY AREA AND VIEWPOINTS

### 6.1 Visual Study Area

The delineation of the visual study area is based on the area from which it is likely that there are significant views on the project elements. This is an integral component to help choose sensitive receptors for the subsequent photo survey and so further analyse the significance of the impact.

VSA modelling used ESRI ArcGIS Desktop software (GIS), initially ignoring vegetation as available data was not suitable for this type of analysis.

Instead, a bare earth digital elevation model (DEM) was used to determine the project visibility, based on a limitation that any view more than 5km from the PAA boundary was not significant due to distance and the scale of existing and project elements.

The VSA map (**Figure 3**) illustrates the maximum potential extent of visual impact for all proposed and existing project elements.

### 6.2 Viewpoints

### 6.3 Angus Place Pit Top

**Figure 3** shows representative viewpoints near the pit top. Given the effective topographic shielding of the pit top from most directions, the only views into the site is from residences on Wolgan Road.



The viewpoints most likely to view the existing infrastructure at the pit top are Wolgan Road residences, and representative receptors have been selected to be consistent with air and noise modelling. The representative pit top viewpoints, measured from the centre of the pit top infrastructure are:

WR2- Residential property located approximately 1km south west from the pit top.

WR1 – Residential property located approximately 1.5km south west from the pit top.

L2 – Residential property located approximately 4.2km south west from the pit top in Lidsdale urban area.

WR3 – Residential property located approximately 1.8km north from the pit top.

The location of these sensitive receptors are provided in **Figure 3**.

### 6.3.1 Newnes Plateau

Predicted subsidence will have very minor visual consequences, owing to scale of change, the lack of receptors and the thick vegetation cover over the mine area. More significant potential visual impacts from subsidence, such as cliff falls and pagoda cracking, have been avoided by the mine planning as addressed in relevant technical reports of the ELIS.

The predominant visual impact of the APMEP on Newnes Plateau is from the construction and operation of surface infrastructure as detailed in **Section 3.1**. While there are no dwellings or other fixed receptors within the PAA on Newnes Plateau, Newnes State Forest is used extensively for camping, 4 wheel driving, motorcycle riding and picnicking. However, these activities are unlikely to have a direct line of sight of the existing or planned infrastructure due to the size of the PAA, the location of recreational areas and the existing topography and vegetation.

The representative view points on the Newnes Plateau are:

NF10 – located along Angus Place Trail east of the pit top.

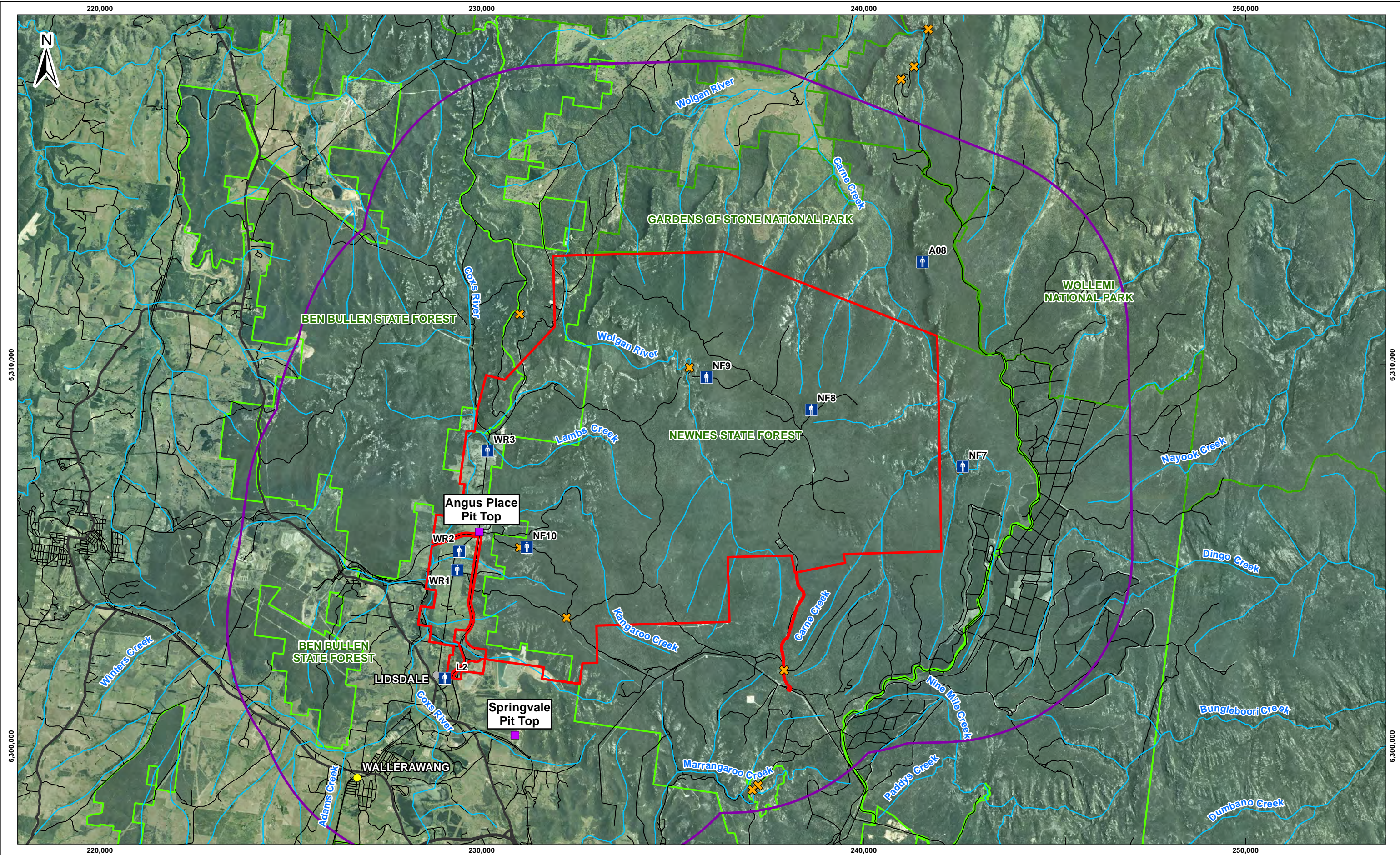
NF8 – Located at Birds Rock Trigonometrical Station near Birds Rock Flora Reserve along the proposed infrastructure corridor to several ESAs

NF7 – Located approximately 500m east of the PAA at the lookout on the end of Fire Trail No. 5;

A08– Located approximately 2 km north of the PAA at the lookout on the end of Fire Trail No. 7;

NF9 – Located at proposed Ventilation Shaft 3.





**LEGEND**

Project Application Area

Sensitive Receptor

Other Photo Survey Location

Village

Town

Rail

Main Road

Street / Track

National Park

State Forest

Watercourse

Visual Study Area

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**Figure 3:  
Photo Survey  
Locations and  
Sensitive Receptors**

PLOTFILE No.

Centennial Coal  
Angus Place

DRG No. 3

A3





## 7.0 PHOTOGRAPHIC SURVEY

A photographic survey was undertaken between 29 March 2013 and 1 April 2013 and on 16 July 2013 of the representative viewpoints.

The photographs were taken with a Canon EOS digital camera and locations were recorded using a Garmin 60s handheld GPS. The photographs of the landscape do not necessarily have a line-of-sight to project elements, but serve to document the general character of the landscape. The photographs from these locations act as a photographic record to support the sensitivity ratings and to illustrate the existing visual environment. These photographs were taken in the close middle and long range distance to demonstrate how the proposed project elements may impact views. The photographs of the existing landscape are illustrated in **Plate 1 to 10**. The impact assessment is based on the photographs of the landscape and modelled views from the sensitive receptors. As broadly identified within **Section 5.2**, the sensitive receptors of the APMEP were chosen based on the following combination of factors:

- Proximity to site (nearby residential properties).
- Areas or corridors within the viewshed that are used by local communities or visitors (for example, local roads or outdoor sport and recreation).
- Proximity to roads, trails, rivers and towns.
- Potential for views over larger portions of the landscape.

Some sensitive receptors were selected as a compromise between different criteria. For example, some locations were selected in open areas near scenic views, if these provided better views of the SVMPEP. The selected sensitive receptors are illustrated in **Figure 3**.



Descriptions of the selected sensitive receptors are as follows:



**Plate 1: Sensitive Receptor – WR2**

A01 is a residential property located approximately 1km southwest from the Angus Place Pit Top. The pit top does not appear to be visible at this location.



**Plate 2: Sensitive Receptor – WR1**

A02 is a residential property located approximately 1.5km southwest from the Angus Place Pit Top. The pit top does not appear to be visible at this location.





**Plate 3: Sensitive Receptor – L2**

A03 is a residential property located approximately 4.2km from the Angus Place Pit Top. The pit top does not appear to be visible at this location.



**Plate 4: Sensitive Receptor – WR3**

A04 is a residential property located approximately 1.8km from the Angus Place Pit Top. The pit top does not appear to be visible at this location.



**Plate 5: Sensitive Receptor – NF10**

A05 is located along existing forest road east of the pit top.



**Plate 6: Sensitive Receptor – NF8**

A06 is located along the proposed infrastructure corridor to several ESAs.



**Plate 7: Sensitive Receptor – NF7**

A07 is located approximately 500m east of the PAA



**Plate: Sensitive Receptor – A08**

A08 is located approximately 2 km north of the PAA,





**Plate 9: Sensitive Receptor – NF9**

A09 is located at the proposed site of ventilation shaft 3.



**Plate 10: Existing buried SDWTS pipeline**

Portion of the existing buried SDWTS pipeline

## 8.0 VISUAL IMPACT ASSESSMENT

### 8.1 Pit Top

All existing facilities at Angus Place pit top will be used by the SVMEP, including the crushing and screening plant, the coal handling system, the workshop, bath house and administration, ventilation for underground workings, dewatering and surface water management.

Based on the methodology described in **Section 3, Table 3** assesses the magnitude and significance of visual effects. As the Project involves no changes at the pit top, the views from WR2, WR1, L2, and WR3 any other fixed or transient viewpoints will remain unchanged. Residents will continue to see parts of the pit top during the day and night. However, there will be no additional visual impact to the existing operations.

**Table 3 Significance of Visual Effect at Pit Top Receptors**

Receptor No.	Magnitude of Visual Change	Visual Sensitivity	Significance of Visual Effects
WR2	No Change	High	None
WR1	No Change	High	None
L2	No Change	High	None
WR3	No Change	High	None

Lighting is provided at the Angus Place pit top to provide a safe working environment and to minimise light spill, directional fitting and baffles have been installed.

Following cessation of mining at Angus Place, the pit top infrastructure will be dismantled and the site rehabilitated to a mixture of grassland and woodland interspersed with water management structures. Surface contours will not generally be altered from pre-mining conditions, and significant earthworks will not be required to return the landform to pre-mining levels. Following rehabilitation, the view from the Wolgan Road receptors will revert back to a more natural view and provide a significant visual benefit.

## 8.2 Newnes Plateau

**Table 4** provides the estimated magnitude of visual change for each Newnes Plateau receptor considering the worst case impact, which will occur during clearing and construction.

**Table 4 Significance of Visual Effects at Newnes Plateau Receptors**

Receptor No.	Magnitude of Visual Change	Visual Sensitivity	Significance of Visual Effects
NF10	No Change	Low	None
NF8	Slight	Low	Minor
NF7	No Change	Moderate	None
A08	No Change	Moderate	None
NF9	Moderate	Low	Moderate to minor

Building the seven dewatering borehole sites will each involve involving 90m x 110m of clearing followed by borehole drilling and machinery and fence installation. Non reflective and neutral toned cladding will be used to reduce the visual impacts. The boreholes are at the end of minor, terminating 4wd tracks and will be decommissioned on completion of mining, with the facilities dismantled and sites rehabilitated to native woodland. The long term visual effect following successful rehabilitation is negligible.

To service the dewatering borehole sites, underground electricity and a pipeline connection to the SDWTS will be supplied. This infrastructure will be buried, requiring the clearing of approximately 10 m alongside of existing tracks. Half of this width will be revegetated with shrubs and ground covers on the completion of construction, in a process identical to that employed in previous construction of the SDWTS. **Plate 10** displays an existing portion of the buried SDWTS pipeline, clearly indicating that the rehabilitation technique reduces construction visual impacts to a negligible level.

Construction and operation of VS3 will cause minor to moderate visual impacts on recreational road users. This section of road leads to the Wolgan Crossing via the locally named "Spanish Steps", which are gated and locked and available for use only by registered 4wd clubs under arrangement with Forestry Corporation of NSW. This section of track is particularly rough and less commonly used than most other roads in the plateau. In the long term, the facility will be dismantled and the site revegetated with endemic species to blend with adjacent undisturbed vegetation thereby reducing the long-term visual impact.



## 9.0 MITIGATION MEASURES

The following visual impact mitigation measures have been incorporated into existing operations and will continue to be utilised for the APMEP as relevant:

- elevated conveyers at the pit top have been clad in neutral coloured steel sheeting;
- lights at the pit top have been designed and installed to Australian Standard 4282-1997 to minimise light spill and direct shining towards receptors;
- the pit top rehabilitation plan provides for revegetation with native woodland and grasslands;
- new infrastructure components will use non reflective and neutral toned cladding will to reduce the visual impacts;
- Newnes Plateau pipelines and powerlines will be buried and the clearing corridor promptly revegetated; and
- Newnes Plateau infrastructure will be progressively dismantled and rehabilitated to an appropriate land use as identified within the rehabilitation technical report within the EIS for the APMEP.

## 10.0 SUMMARY AND CONCLUSIONS

The Angus Place pit top area can be visual characterised by the existing long term land uses such as rural residential, power generation and mine infrastructure. The existing visual effects of Angus Place pit top will continue to be observed by representative and other receptors in the vicinity, most particularly by residents along Wolgan Road. APMEP will not increase these impacts and they have been observed for many years. At the cessation of mining, the proposed rehabilitation of the pit top, which includes dismantling of surface infrastructure, will provide a significant visual benefit to receptors.

Newnes Plateau is a relatively undisturbed bushland area used primarily for active recreation and forestry. Surface mining infrastructure already exists on Newnes Plateau with the SVMPEP proposing additional dewatering boreholes, associated buried pipelines and powerlines, a mine services borehole compound and the duplication of the existing SDWTS. Effective visual mitigation measures have been incorporated into the infrastructure designs with the significance of visual effects being predominantly none to minor. On cessation of the surface infrastructure component of the SVMPEP, it will be revegetated appropriately to ensure a suitable end land use that is consistent with the surrounding visual character.



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## Report Signature Page

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# APPENDIX A

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