DRAYTON SOUTH COAL PROJECT

Visual Impact Assessment

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This report was prepared by:

JVP visual planning and design
Phone: 07 3880 4788
Fax: 07 3880 1659
john@jvpdesign.com.au
ala.jvp@bigpond.com

Project Manager:	ANNETTE ALLEN
Author:	John van Pelt/ Annette Allen
Internal Reviewer:	John van Pelt
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GLOSSARY AND ABBREVIATIONS

Areas of Primary Visual Concern	Areas that have potential views of the Project based on a consideration of topography alone as a screening.
BSAL	Biophysical Strategic Agricultural Land
Critical Industry Cluster (CICs)	Critical Industry Clusters are concentrations of highly productive industries within a region that are related to each other, contribute to the identity of that region, and provide significant employment opportunities.
Contrast	The degree to which a development component differs visually from its landscape setting.
Field of View	This area includes the total view, consisting of the primary view zones above and the secondary or peripheral view zones around the primary view zone, out to about 70^0 either side of the central view line in both vertical and horizontal plain.
Integration	The degree to which a development component can be blended into the existing landscape without necessarily being screened from view.
Overburden Emplacement Area (OEA)	Refers to the placement of waste material (mostly dirt and rock) excavated as part of the coal mining process into a predefined area.
PAC	Planning Assessment Commission
Photomontage	Photomontage is the process and result of making a composite photograph by cutting and joining a number of other photographs or graphic images for illustrative effect. The composite picture or image aims to give a visualisation of a projected visual effect.
Primary View Zone (PVZ)	This zone is the central most critical part of a view that is seen with the greatest clarity. It is that part of a view that is within a horizontal arc of 30^0 either side of the centre line of a view and a vertical arc of 30^0 above the horizontal.
Project	Drayton South Coal Project
Screen	The degree to which a development element is unseen due to intervening landscape elements such as topography or vegetation.
SRLUP	Strategic Regional Land Use Plan
Visual Absorption Capacity (VAC)	The Visual Absorption Capacity is defined as the ability of that VCU to screen and or visually integrate the project components or associated activities.
Visual Character Unit (VCU)	Visual Character Units are Areas of landscape that have similar topographic, vegetation and land use features that create areas of similar visual character.
Visual Effect	A measure of the visual interaction between the Project and the landscape setting within which it is located.
Visual Impact	A measure of a joint consideration of both visual sensitivity and visual effect that considered together determine the visual impact of a development.
Visual Sensitivity	Degree to which a change to the landscape will be perceived in an adverse way.
Visual Study Area (VSA)	The Visual Study Area includes the most significant parts of the total visual catchment from which the Project Area potentially could be seen. This is the area containing the most critical locations with potential views to the Project, which will be the focus of this Visual Impact Assessment.

EXECUTIVE SUMMARY

Drayton Mine is located in the Upper Hunter Valley, 13 kms from the town of Muswellbrook and has been operating in that community for over 30 years. The Drayton South Coal Project (the Project) will allow for the continuation of the existing operation for up to 15 years by developing an open cut mine in EL 5460.

The Project addresses the reasons provided by the PAC for the refusal of the previous application. The mine plan and Project Boundary is defined by ridgelines nominated in the 'Drayton South Coal Project Planning Assessment (PAC) Review Report' for the previous application issued in December 2013.

The Project components comprise of active open cut mining areas, overburden emplacement areas (OEAs), mine site facilities, haul roads, transport corridors, water management infrastructure, realignment and upgrade to parts of Edderton Road and progressive rehabilitation. Existing Drayton Mine infrastructure in its current location will be utilised as an operational part of this Project.

The main components of the Project are the Whynot and Blakefield active mining areas and associated OEAs. These new open cut mining areas and OEAs fall to the north of the limit of disturbance recommended by the PAC for the previous Drayton South application and the prominent screening ridgeline that runs along the southern extent of the Project Boundary.

The development of the Project and more specifically the major mine components associated with it has the potential to create high direct visual effects in the context of the existing landscape, although these effects are mitigated to some degree by mining activity on adjoining lands.

Views of open cut mining areas and OEAs create an initial high direct visual effect. This effect is not reduced until these areas are progressively rehabilitated. These direct visual effect from the OEAs will be reduced at an earlier stage of mine development following detailed ground shaping, grassing and subsequent establishment of tree cover. The direct visual effect will be low as visual integration with the surrounding landform and vegetation is achieved due to early rehabilitation of outward faces.

The active mining areas and OEAs for the Project are visible to a limited number of sensitive receptors in the foreground and middle-ground, due to the screening ridgelines, so the high direct visual effect has limited significance.

The direct visual effect of the mine site facilities will be moderate to high due to the collective industrial nature of the combined components. However, visibility to these facilities is limited to select areas to the north which contain existing views of mining activity.

The direct visual effect of the transport corridor will be moderate to high but is similar in character to many existing unsealed rural access roads.

Both water management infrastructure and the proposed Edderton Road realignment and upgrade will have low visual effects.

Mining operations will have visual effects where they are visible as a result of small scale elements. Indirect effects may include dust and blasting emissions and night lighting where direct views are not available.

The visual impacts of all Project components are dependent on potential views from sensitive receptors such as horse studs, vineyards, residences and highways. Of these, views from the horse studs of Coolmore and Woodlands are considered the most significant as are views from

the Golden Highway. This includes the experience of night lighting in a view.

An analysis of line of sight views and 3D modeling of concept mine plans, in combination with levels of visual effect, determined that potentially high visual impact is limited to two rural homesteads located to the north of the Project and to a section of Edderton Road with views to the south east, prior to the establishment of screening vegetation.

All other sensitive receptors (including Coolmore and Woodlands horse studs) are screened from the Project components by the intervening topography and vegetation. Distance from the Project also contributes to the low levels of potential visual impact for rural residences to the west.

There are numerous mitigation measures incorporated in the design and operating plans for the Project that will reduce the visual effect and mitigate the visual impact of the Project on sensitive viewing locations. The key measure is the proposed mine plan design that ensures that the PAC recommended ridgeline was maintained and that all OEAs remain shielded behind this ridgeline, particularly from receptors in the southern and western sectors. Other measures include tree planting along sections of the Golden Highway and Edderton Road as well as additional tree planting along existing ridgelines to the east of the existing Edderton Road and south of Whynot and Blakefield mining areas.

Indirect visual impacts include those effects experienced by residential receivers and land uses within the VSA that are not related to direct views of Project elements, but where evidence of Project activities can be perceived. Indirect visual impacts with the potential to occur as a result of the Project could include visible dust, blast emissions, night lighting, mine related traffic, site infrastructure and signage.

Given the setbacks to sensitive receptors, especially to the south, landscape mitigation strategies and the proximity of existing adjacent mining operations immediately to the north and east, these indirect impact effects are considered to be minimal.

Ongoing stakeholder consultation will be undertaken to identify any issues that arise in relation to visual impacts on surrounding sensitive viewing locations. These would be addressed through consultation with the relevant parties. If deemed necessary, additional measures may also be established to achieve greater mitigation at specific sensitive viewing locations. Such measures would include offsite visual treatments, such as establishing tree screens and / or plantings at the viewer's location to reduce visibility.

1 INTRODUCTION

JVP Visual Planning and Design has been engaged by Hansen Bailey Environmental Consultants (Hansen Bailey) on behalf of Anglo American Coal (Anglo American) to complete a Visual Impact Assessment for the Drayton South Coal Project (the Project). This follows the 2012 Visual Impact Assessment documents prepared for the previous Drayton South Coal Project application (PA 11_0062) and the Planning Assessment Commission (PAC) recommendations following review of previous submissions.

The purpose of this assessment is to form part of the Environmental Impact Statement (EIS) being prepared by Hansen Bailey to support a new application for a contemporary Development Consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to facilitate the continuation of the existing Drayton Mine. This continuation includes minor additional mining within existing approved Drayton Mine for a period of 15 years; and the development of an open cut coal mining operation and associated infrastructure within EL 5460.

The primary objective of the assessment is to provide a comprehensive Visual Impact Assessment of the Project for submission as part of the EIS. This includes an assessment of the existing visual settings created by various landscapes in and around the Project:

- Establishing the visual character and visual effect created by the Project;
- A consideration of the visibility of the Project from sensitive receptors;
- The likely visual impacts created by the Project (including both short term and long term) having regard to visual effect and sensitivity;
- An assessment of potential night light effects;
- Consideration of cumulative visual impacts in the locality; and
- The development of mitigation strategies to ameliorate any adverse visual impacts.

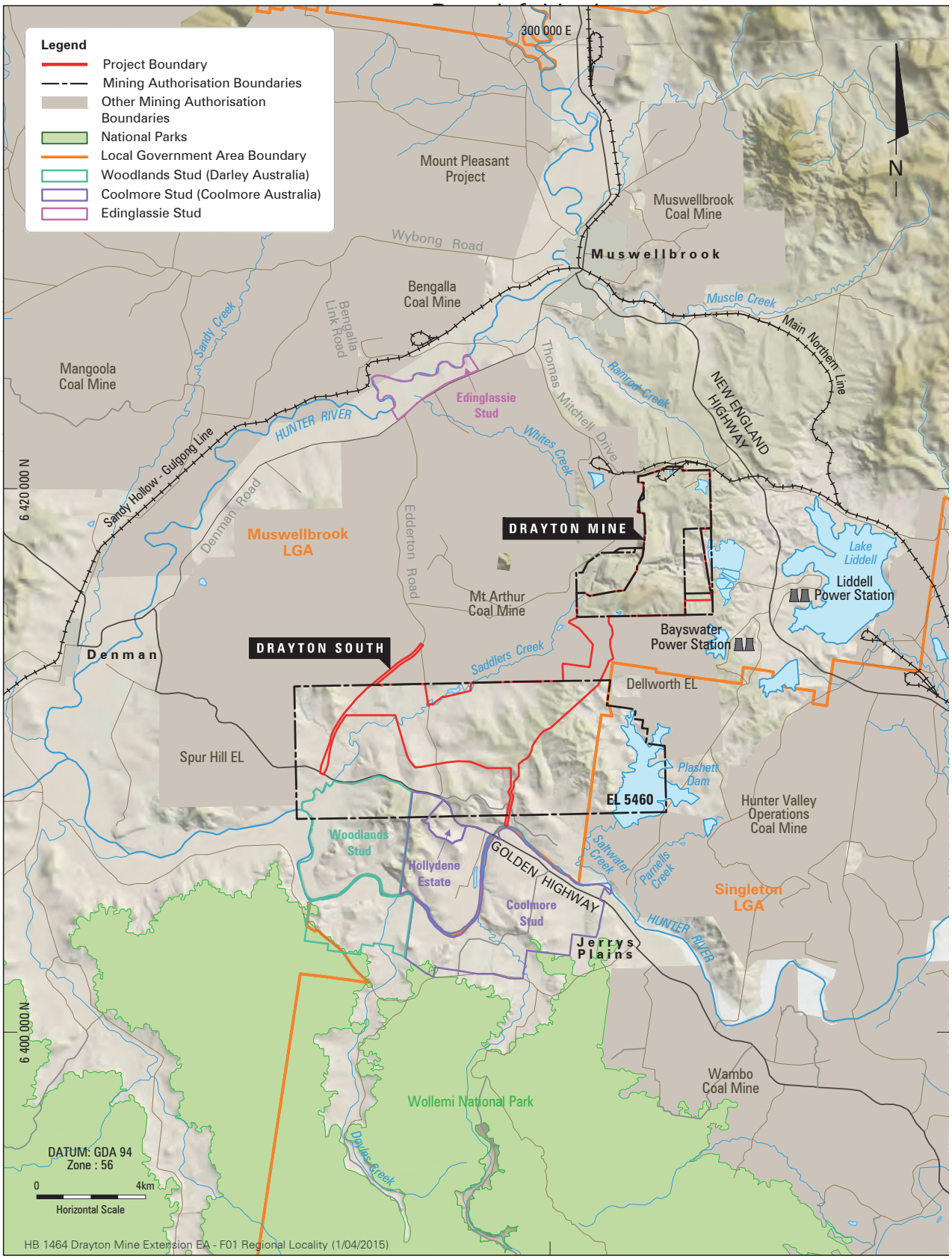
1.1 Project Description

Drayton Mine is located approximately 13 km south of the township of Muswellbrook in the Upper Hunter Valley of NSW (see Figure 1.1). Drayton Mine has been operating in the Muswellbrook community for over 30 years and runs out of coal in 2015.

The Project will allow for the continuation of the existing Drayton Mine for up to 15 years, by developing an open cut mining area within EL 5460. The Project will extract up to 6.4 Million tonnes per annum (Mtpa) of export quality thermal coal by utilising existing Drayton Mine assets and infrastructure.

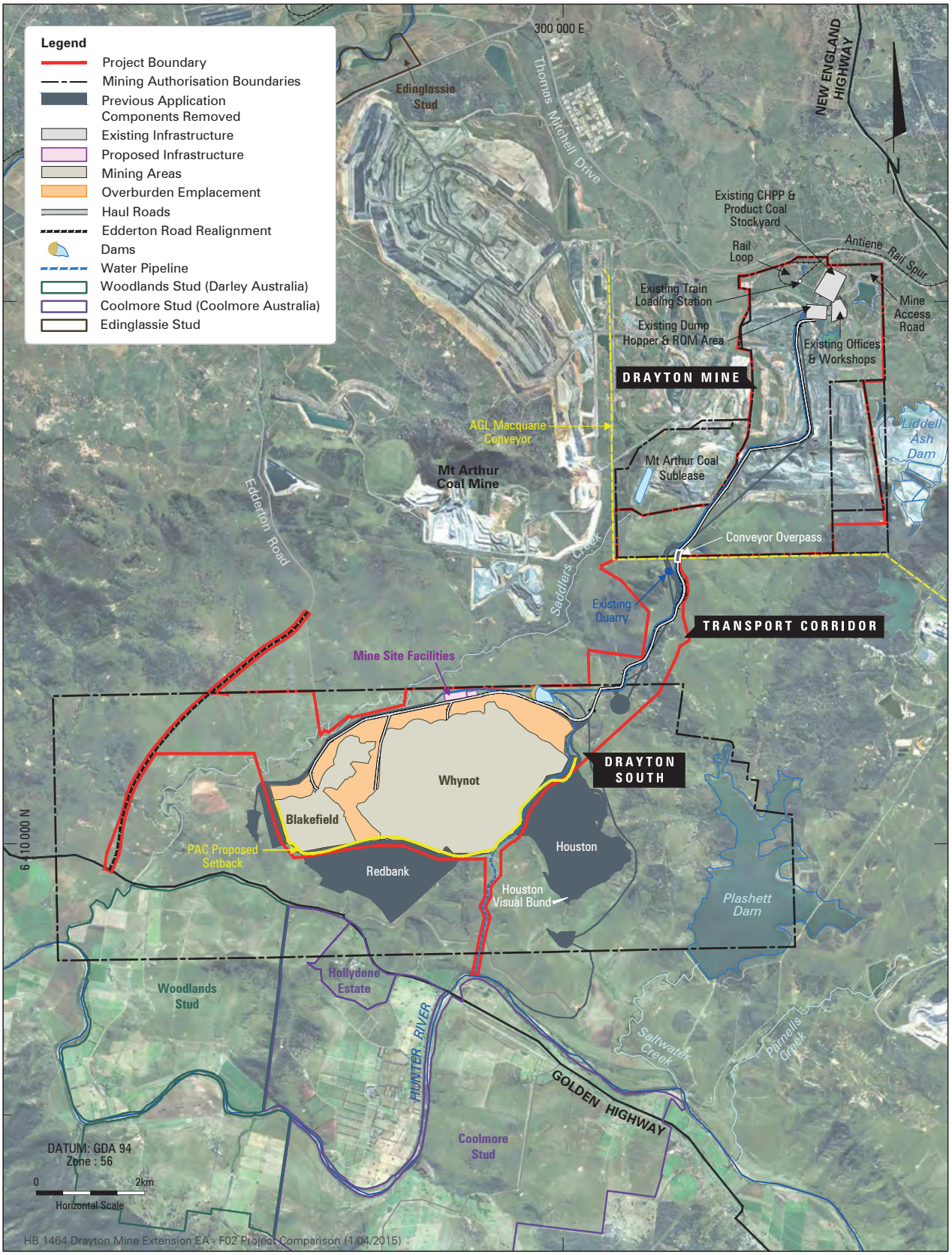
The Project addresses the reasons provided by the PAC for the refusal of the previous Drayton South application. The mine plan and Project Boundary is defined by ridgelines nominated in the 'Drayton South Coal Project PAC Review Report' for the previous application issued in December 2013. The Project will remain behind the ridgelines nominated by the PAC. Significantly, this at least doubles the buffer setback distance from the Coolmore and Woodlands thoroughbred horse studs and is at least 2 km from the horse stud operational areas.

The comparative Project layout shown in Figure 1.2 illustrates the reduced areas of mine operations proposed in relation to the previous application.



Mine plan courtesy of Hansen and Bailey 2015

Figure 1.1 | ***Drayton South Coal Project Regional Locality***



Mine plan courtesy of Hansen and Bailey 2015

Figure 1.2 | ***Conceptual Project Layout Comparison***

2 ASSESSMENT METHODOLOGY

2.1 Introduction

The methodology used to determine the level of visual impact of the Project involves, in the first instance, a consideration of the existing visual environment. This includes a consideration of existing landscape settings, and how they are seen from various viewing locations. In this way the visual character of the landscape as well as visual sensitivity of the various viewing locations can be determined.

Secondly, the visual effect of the Project is determined by considering the visual characteristics of the Project in the context of the landscape within which it is seen.

A combined consideration of both visual sensitivity and visual effect identifies the level of impacts and directs whether any mitigation strategies are required. The overall method of visual assessment of the existing landscape and the Project in the context of the landscape is outlined in Figure 2.1.

2.2 Evaluation of the existing visual environment

The evaluation of the existing visual environment consists of the assessment of both the landscape and viewing locations within it. It also includes consideration of the statutory framework within which any development must be considered.

2.2.1 Landscape Setting

The landscape setting can be defined in terms of topography, vegetation, hydrological and land use features. These elements define the existing visual character of the landscape that the Project interacts with. Within any landscape there are areas of similar visual features that are defined as a Visual Character Unit (VCU). Defining the landscape in terms of these units assists in understanding the visual character of the landscape as a whole.

2.2.2 Visual Study Area and Viewing Locations

The Visual Study Area (VSA) includes the most significant parts of the total visual catchment from which the Project Area potentially could be seen. This is the area containing the most critical locations with potential views to the Project and was the focus of Visual Impact Assessment (see Section 3.3).

Viewing locations are those areas where people are likely to obtain a view of the Project. These viewing locations have different significance based on numerous factors, collectively evaluated through land use and distance.

In this instance, the critical viewing locations within the VSA were those associated with the Equine CIC (Coolmore Stud and Woodlands Stud), Viticulture CIC (Hollydene Estate), local townships (Jerrys Plains), rural residences and the main road/ tourist route through the study area, being the Golden Highway.

There are numerous locations within the vicinity of the Project that would potentially be visually impacted by the Project to various levels. For the purpose of this Visual Impact Assessment, a number of sites within key sectors of the VSA were selected as representative viewing locations. These representative viewing locations were also selected following an extensive consultation process with key stakeholders. This included a field assessment and detailed analysis of aerial photography and topographic plans to determine the likely visibility of the Project. Whilst there would be some variation in the impacts on specific viewing locations, an

overall assessment of the visual impact on the selected locations would be representative for the majority of views experienced. The representative viewing locations selected were evaluated using photomontage simulations of the Project mine plan.

2.2.3 The Project

The Project is evaluated to define the elements that are most significant from a visual perspective. The Project elements are defined as being major or minor and are considered in terms of how they contrast with the existing environment.

2.3 Statutory Framework

2.3.1 Environmental Planning and Assessment Act 1979

The EP&A Act is the overarching planning legislation in NSW. This act provides for the creation of planning instruments that guide land use.

Development Consent for the Project is sought under Division 4.1 of Part 4 of the EP&A Act. It is considered that the Project should be declared to be State Significant Development as it satisfies both of the required elements under the *State Environmental Planning Policy (State and Regional Development) 2011.*

This Visual Impact Assessment has therefore been prepared in accordance with Division 4.1 of Part 4 of the EP&A Act and the Secretary's Environmental Assessment Requirements for the Project.

2.3.2 Strategic Regional Land Use Plan – Upper Hunter

The NSW government released the Strategic Regional Land Use Plan (SRLUP) for the Upper Hunter region in September 2012. The plan represents a component of the government's broader Strategic Regional Land Use Policy, which comprises initiatives to address land use conflicts in areas such as the Upper Hunter and includes a particular focus on managing coal and coal seam gas issues.

The SRLUP defines areas of biophysical strategic agricultural land (BSAL) and CIC, including clusters for the equine and viticulture industries. In accordance with the SRLUP, coal mining and coal seam gas projects that are located in areas of defined BSAL or CICs must consider the potential for impacts in accordance with the prescribed 'Gateway Criteria' listed within the plan. While the Project is not situated on BSAL as mapped under the SRLUP, a portion of the Project was verified as containing BSAL by SLR (2015). The Project does not fall within areas of mapped Equine and Viticulture CIC, or on land operated by horse stud or viticulture enterprises (see Figure 2.2).

This Visual Impact Assessment has considered the potential for the Project to lead to significant visual impacts on the nearby lands mapped under the SRLUP as Equine and Viticulture CICs through loss of scenic and landscape values.

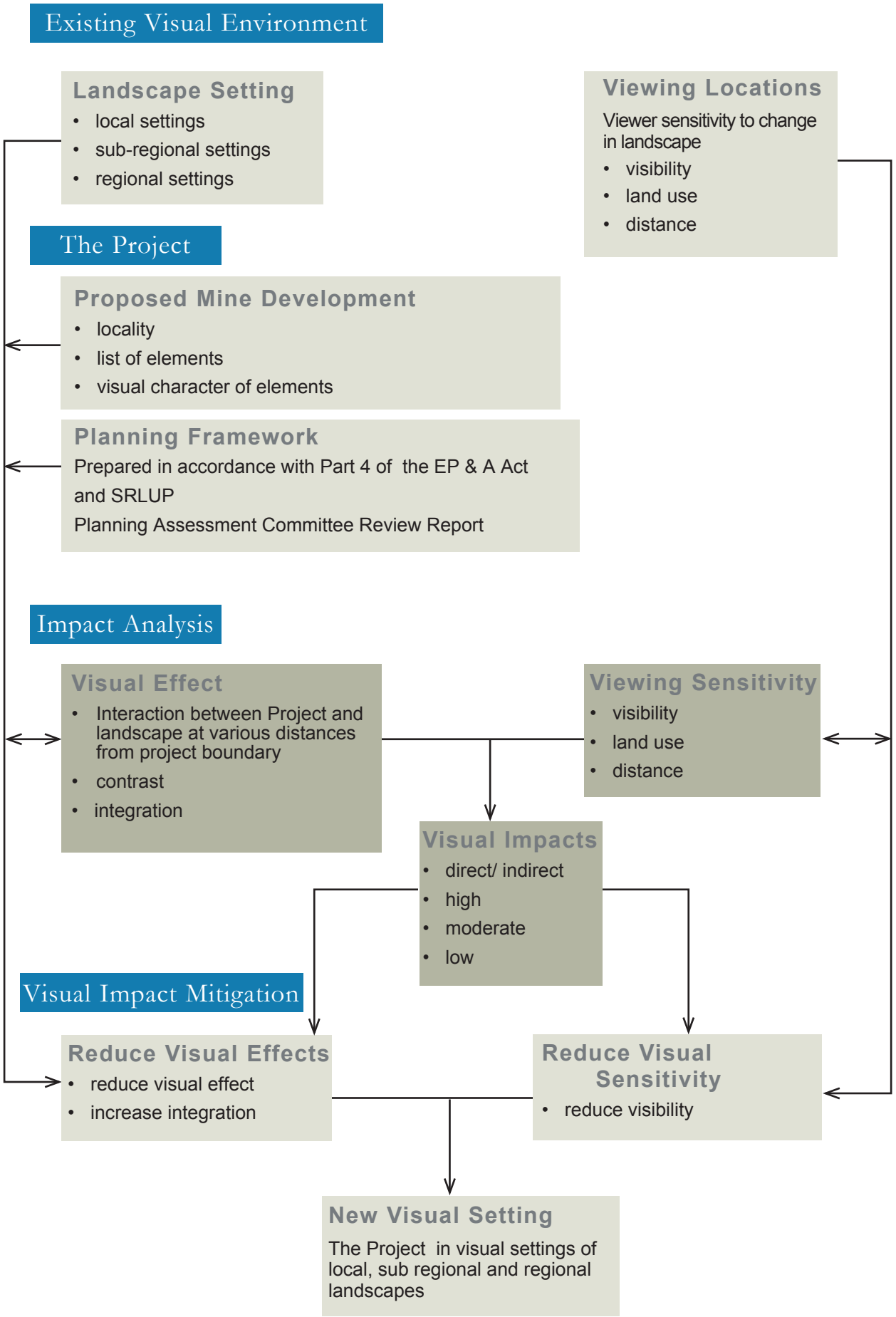


Figure 2.1 | *Visual Assessment Methodology*

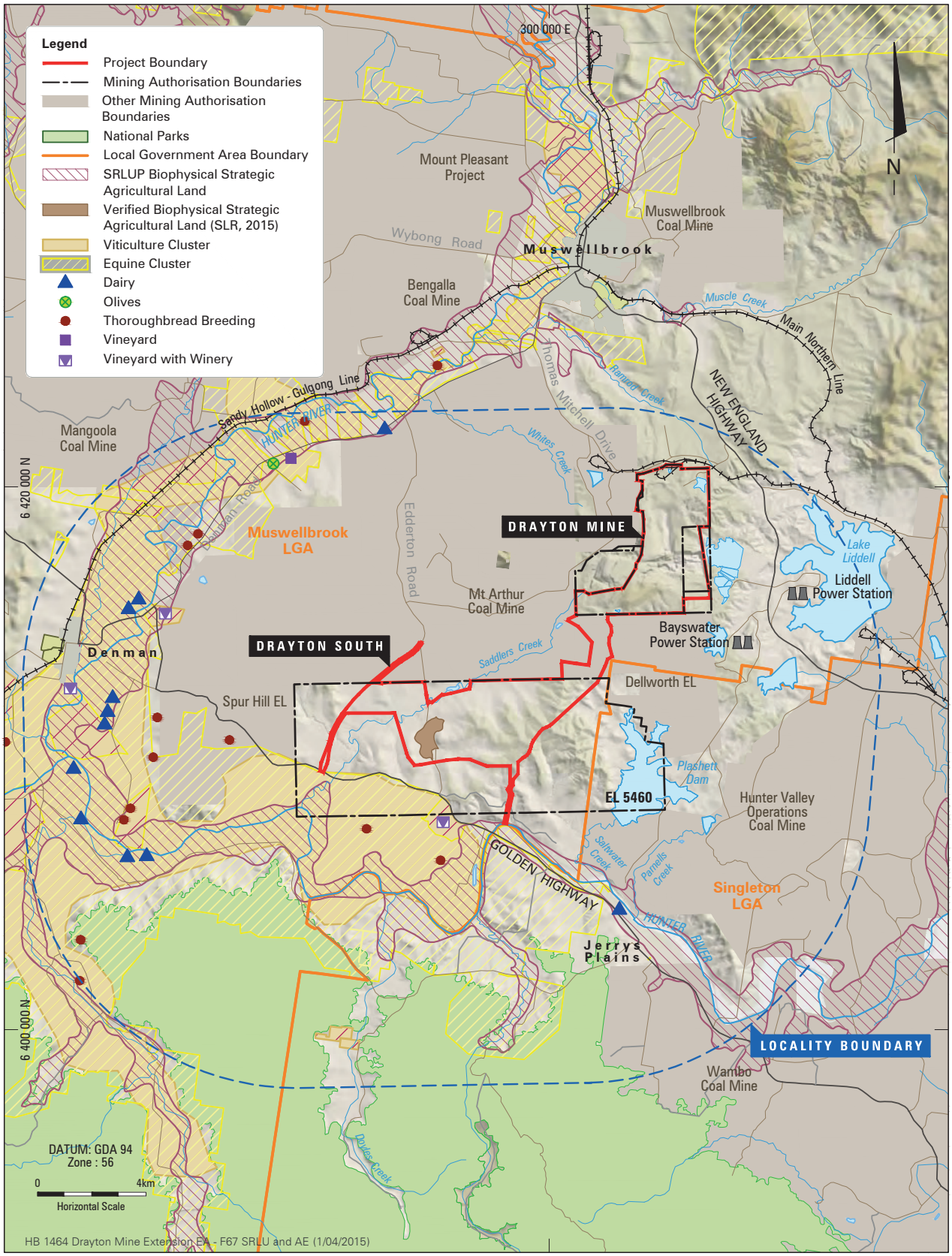


Image courtesy of Hansen Bailey 2015

Figure 2.2 | ***Project layout in context of Strategic Regional Land Use and Agricultural Domains***

2.3.3 Previous Application PAC Determination and Recommendations

Consideration was given to the findings and recommendations of the 'NSW Planning Assessment Commission Determination Report *Drayton South Coal Project, Muswellbrook LGA'* issued in October 2014. The PAC report identifies key recommendations required to ensure protection of landuses associated with the Equine CIC as defined by the SRLUP.

2.4 Impact Analysis

The analysis of the interaction between the existing visual environment and the Project provides the basis for determining impacts and mitigation strategies. This is achieved by defining the visual effect of the Project and visual sensitivity of viewing locations to determine impact.

2.4.1 Visual Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different land use areas in the vicinity of a project.

In this regard, land uses that *'use'* the amenity values of the landscape generally have a higher visual sensitivity than other land use areas that place lesser importance on amenity and scenic values. Higher sensitivity landuses would generally include residential, tourist and recreation areas, and in the case of the Project, neighbouring horse studs and wineries, which use the scenic amenity values of the surrounding landscape as part of their business image. Industrial, agricultural lands or transport corridors would have a lower visual sensitivity. Table 2.1 indicates the levels of visual sensitivity associated with the Project.

The visual sensitivity of individual residences within each landuse type may range from high to low, depending on the following additional factors:

- Screening effects of any intervening topography, buildings or vegetation. Residences with well screened views of the Project will have a lower visual sensitivity than those with open views;
- Residences with existing uninterrupted views to an individually valued landscape will be sensitive to any changes to those views as a result of activities associated with the Project. These changes may include the alteration of land uses and existing vegetation patterns or alterations to open landscape topography.
- Viewing distance from the residence, or other sensitive receptor, to visible areas of the Project. The longer the viewing distances, the lower the visual sensitivity; and
- General orientation of residences, or sensitive receptors, to landscape areas affected by the Project. Residences with strong visual orientation towards the Project, i.e. those with areas such as living rooms and/or verandas orientated towards it, will have a higher visual sensitivity than those not orientated towards the Project, and which do not make use of the views toward the Project.

For the visual sensitivity of any area to be determined, it must first have potential visibility to the Project. Table 2.1 identifies the interacting factors of land use and distance from visible Project components that are used to evaluate visual sensitivity. The level of visibility was determined based on field assessment, map and aerial photo evaluation and/or computer assessment of topographic and vegetation data (see Section 5).

Land Use	Visual Sensitivity Levels			
	Nearest visible mine area less than 2.5kms away	Nearest visible mine area between 500m - 2.5kms - 7.5kms	Nearest visible mine area between 7.5kms - 12.5kms away	Nearest visible area more than 12.5km away
Urban and rural houses	High Sensitivity	High Sensitivity	Moderate Sensitivity	Low Sensitivity
Destinations of visually high sensitive land uses eg. horse studs, vineyards	High Sensitivity	Moderate Sensitivity	Low Sensitivity	Low Sensitivity
Designated tourist roads eg Golden Highways	High Sensitivity	Moderate Sensitivity	Low Sensitivity	Low Sensitivity
Commercial Facilities	High Sensitivity	Moderate Sensitivity	Low Sensitivity	Low Sensitivity
Other main roads eg Edderton Road	Moderate Sensitivity	Low Sensitivity	Low Sensitivity	Low Sensitivity
Minor local roads in rural zone eg Bureen Rd.	Moderate/Low Sensitivty	Low Sensitivity	Very Low Sensitivity	Very Low Sensitivity
Broad acre rural lands	Low Sensitivity	Low Sensitivity	Very Low Sensitivity	Very Low Sensitivity

Table 2.1 | *Visual Sensitivity*

2.4.2 Visual Effect

Visual effect is a measure of the level of visual contrast and integration of the Project with the existing landscape.

The degree to which the visual characteristics of the Project contrast with the existing landscape will determines the level of visual effect. The development of a new mine in an area where mining is not a current land use will have a higher visual effect due to strong contrast. The development of a mine or an extension to an existing mining area will have a lesser visual effect where there is a low level of contrast and effective integration with the surrounding landscape. It will also be more of the same type of visual element so the visual contrast with the existing landscape will be a lesser factor. A successfully rehabilitated project will have a low visual effect due to limited contrast with the existing landscape.

A project can be integrated with the existing landscape depending on its scale, position in the landscape and contrast. High visual integration is achieved if a development is dominated by the existing landscape, is of small scale and / or of limited contrast.

The magnitude of the visual effect is outlined in Table 2.2 and is determined by a balanced consideration of the following:

- Contrast and integration;
- Proportion of a view that includes elements of the Project; and
- Photomontage development.

2.4.3 Contrast and integration

The level of contrast and integration of the Project with its surrounding landscape determine visual effect. Project elements as expressed through the visual expression elements (i.e. form, shape, pattern, line and colour with minor consideration in relation to texture) contrast to varying degrees with the surrounding landscape and will also to varying degrees integrate with it.

Visual Properties			Visual Effect Levels		
Contrast Levels with elements in primary view zone	Visual Integration with elements in primary view zone	Visual Effect Categories	High Visual Effect	Moderate Visual Effect	Low Visual Effect
High Development elements do not borrow form, shape, line, colour or texture or scale from existing features of the visual setting and contrast levels are high with existing landscape.	Low The development lacks integration with visual setting because of scale totally dominating the ability of site or surrounding features, vegetation and or topographic features to integrate the development.	Category 1	It occupies more than 2.5% of the primary view zone	It occupies between 1 - 2.5% of the primary view zone	It occupies less than 1% of the primary view zone
Moderate Development elements borrow from some features of the visual setting in terms of form, shape, line pattern and or colour and scale, reducing visual contrast with existing setting.	Moderate The development has some degree of visual integration with setting from other features, vegetation and or topography achieve some level of integration.	Category 2	It occupies more than 20% of the primary view zone generally when in a foreground location	It occupies between 20-10% of the primary view zone	It occupies less than 10%
Low Development elements borrow extensively from features in visual setting in terms of form, shape, line, pattern colour and scale minimizing contrast with the existing setting.	High Visual integration is high due to other features, vegetation and or topography achieving dominance and screening or filtering	Category 3	The development occupies more than 40% of the primary view zone	The development occupies 40-30% of the primary view zone	The development occupies less than 30% of the primary view zone

Table 2.2 | *Visual Effect Levels*

2.4.4 The proportion of a view that includes elements of the Project

For any given type of contrast and integration, the lower the proportion of the view that is occupied by the Project, the lower the level of visual effect. This is determined by defining the proportion of the total field of view occupied by the Project, or more appropriately determined by defining what percentage of the Primary View Zone (PVZ) it occupies (see Figure 2.3).

The PVZ is the most critical and central part of a view. It is not the total view, but the most important part. It is that area that is occupied by an arc created by sight lines from the eye radiating out horizontally at angles of 30^0, around a centre view line; and vertically at an angle of 30^0 above the horizontal around a centre view line. Measuring the percentage of the PVZ occupied by a development will provide a more critical measure than a measure of the development in the context of the whole view zone which would include both primary and secondary view areas, representing a view arc of 120 - 160^0 of which the PVZ is only 60^0.

Generally, a high visual effect category will result if a visible area of the Project has a high visual contrast and low integration to the surrounding landscape.

A low or very low visual effect level will occur if there is minimal contrast between the visible area of the Project and the existing landscape setting and or the areas occupied by the Project

are only small parts of a total view.

The higher the visual effect level, the lower the permissible percentage of the primary view that may be affected, before a high visual effect is scored. For a high visual effect category, the percentage of view that can be affected is 2.5% before a high visual effect is scored (see Table 2.2, Visual Effect Levels and Figure 2.3, Area of Primary View Zone).

2.4.5 Photomontage Development

The visual effect of the Project on external viewpoints was determined by the development of a number of photomontages taken from the selected representative locations within the VSA. The assessment of visual effect from these locations takes into account the significant views of the project expected to be seen from these areas.

Photographs of the Project were taken at standing eye level from the selected viewing locations. The precise location of each of these photograph positions was recorded by a registered surveyor using a GPS. The photography provides a realistic representation of the site landscape and how it is seen from each viewing location in response to light and atmospheric conditions.

Three dimensional computer models of the Project at representative stages of the mines progression were created from digital surface topography and Project development plans. The models enable accurate views of the Project to be generated from any specified viewing location and account for screening of views by natural topography. The photographs of the Project and its landscape setting were overlain on the model view from the same viewing location. The locations of extent of mine levels and future visible components of the Project were determined taking into account any foreground screening from topography or vegetation in the photograph. Where indicated, realistic colours and textures were applied to the visible Project components, taking into account viewing distances. The end result is an accurate and realistic indication of the likely future views of the Project from the selected representative viewing locations.

The photomontages with a dashed white line indicating the mine extent were used to assist in determining the level of visual effect of the Project from each of the representative viewing locations. To further assist in evaluating visual effects as illustrated by photomontage, it is useful to use 60mm (camera focal length) or greater to illustrate how the eye perceives the actual size of objects. Lower focal lengths are often used to enable a larger part of the primary view zone to be captured. In such photomontages, the scale of the Project elements is in scale with other features, including those of the landscape. However focal lengths such as a 30-35mm digital camera focal length create an actual 50mm focal length, with a conversion factor of approximately 1.3. This photomontage will accurately portray the Project elements and their scale to other elements, however will appear ‘smaller’ and ‘more distant’ than the human eye perceives. The larger focal length used, while foreshortening views a little, does give a better concept of the ‘size’ of Project elements. Hence, the use of a 70mm focal length is generally likely to provide a more accurate representation of Project elements in the landscape.

2.4.6 Visual Impact

The visual impact of a Project is determined by considering both visual effect and visual sensitivity, which together determine the impact level. The way in which the parameters of visual sensitivity and visual effect are cross referenced to determine visual impact is illustrated in Table 2.3. For example, if a view location or receptor is ascertained to have high sensitivity as determined by land use, and a visible Project component is deemed to have low visual effect due to the combination of contrast, scale, integration and distance from view location,

Area of Primary View Zone at various distances from a project area

Distance from Project Site	Area of Primary View Zone
1 km	0.60 km²
2 km	2.4 km²
3 km	5.43 km²
4 km	9.66 km²
5 km	15.09 km²
6 km	21.73 km²
7 km	29.57 km²
8 km	38.62 km²
9 km	48.88 km²
10 km	60.35 km²
11 km	73.02 km²
12 km	86.9 km²
13 km	101.99 km²
14 km	118.29 km²
15 km	135.79 km²

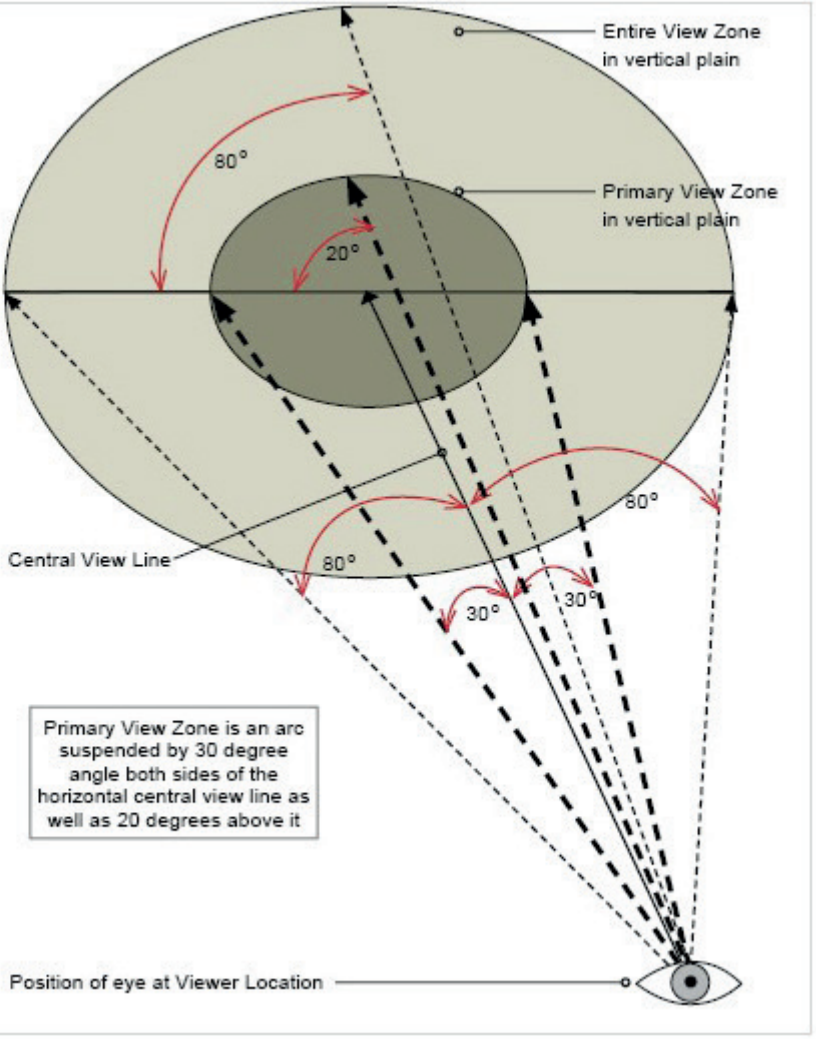


Figure 2.3 | ***Area of Primary View Zone at Various Distances from a Project.***
The Primary View Zone being the most critical and central part of any view.

		Visual Sensitivity		
		High	Moderate	Low
Visual Effect	High	High Visual Impact	High/Moderate Visual Impact	Moderate/Low Visual Impact
	Moderate	High /Moderate Visual Impact	Moderate Visual Impact	Moderate/Low Visual Impact
	Low	Moderate/Low Visual Impact	Moderate/Low Visual Impact	Low Visual Impact
	Very Low	Low Visual Impact	Very Low Visual Impact	Very Low Visual Impact

Table 2.3 | *Visual Impact*
Visual Impact is dependant on the interaction between visual effect and sensitivity

then the visual impact is assessed as moderate to low at that view location. This cross referencing of visual sensitivity and visual effect can be undertaken for each receptor location to determine a level of visual impact.

2.5 Indirect Visual & Landscape Impacts

The perception of indirect visual and landscape impacts is caused by numerous factors, in addition to any direct views of a development or change in the landscape that may be experienced from time to time. Examples of indirect visual impacts might include the ephemeral effects of dust associated with operations and blasting and night lighting that gives an indirect indication of mining activity. These indirect impacts, if experienced, can be short lived, however they can also leave an impression of an activity that remains beyond the transient event. These potential indirect effects are taken into consideration and evaluated in the context of the land use pattern and sensitivity the location assessed.

Many of the factors evaluated having been already considered as part of the direct Visual Impact Assessment. These factors are re-evaluated to consider the potential for indirect impacts on the landscape through the following process:

Step 1 – Define the Study Area Boundaries.

Set appropriate study area boundaries for the analysis of indirect effects as well as the timeframe for the analysis. This is defined as the VSA in the assessment of direct visual impacts.

Step 2 – Identify the Study Area Trends and Goals.

Gather information on community trends and goals in the VSA, focusing on land use patterns. This is completed by establishing land use patterns and Visual Character Units within the VSA and a broader appreciation of regional land use patterns.

Step 3 – Inventory Notable Features.

Identify specific valued, vulnerable or unique elements of the natural environment that will be analysed in the assessment of indirect effects. This is done to varying degrees in the evaluation of the existing landscape setting of the VSA.

Step 4 – Identify Impact Causing Activities of the Proposed Action and Alternatives or Remediation.

Identify the cause and effect relationships between the development and potential impacts that may come into conflict with the goals identified in Step 2 or the notable features identified in Step 3. This is completed by doing a visual effect study for direct visual impact, with recommendations outlining alternatives or remediation.

Step 5 – Identify Potential Impacts For Analysis.

Compare the impact-causing activities developed in Step 4 with the inventory of goals, trends and notable features that make up the baseline conditions identified in Steps 2 and 3. This is the description of visual effects created by the various mining operations and components, with more emphasis on short term ephemeral contributors to indirect impacts.

Step 6 – Analyze Impacts.

Determine the magnitude and location of the potential impacts identified in Step 5. This is done by defining the level of visual effect. Again the visual effect of ephemeral activities is generally low due to the limited time and extent in which they occur. However, the effect of indirect impacts can go beyond this period due to perception and build-up of experiences over time.

Step 7 – Evaluate Analysis Results.

Evaluate the uncertainties in the methodology used to determine impacts, in order to better understand the analysis results. This reflects the need to interpret results. For example, a dust plume associated with a blasting on first analysis is a minor visual effect. However considered in the context of being viewed by people visiting the horse studs, for example, may change that perception. Such events need appropriate recognition.

Step 8 – Assess Consequences and Develop Mitigation.

Assess the consequences of the impacts and to develop strategies, including overall mine design to address unacceptable impacts, which occur when an impact identified in Step 6 conflicts with a goal identified in Step 2 or with a notable feature identified in Step 3. All the above steps are completed within the assessment direct visual impacts. What is need is a further interpretation of these assessments in terms of indirect Impacts and the different perception of them.

2.6 Visual Impact Mitigation

Where necessary, visual impacts are reduced by mitigation measures designed to reduce visual effects and/or visual sensitivity. Depending on the situation, effective impact mitigation strategies may be implemented either on the Project site or off-site.

2.6.1 Reduce Visual Effects

Rehabilitation of disturbed areas associated with the Project will decrease the visual contrast created by mining operations to the existing landscape. The rehabilitation strategies that emulate patterns, shapes, line and colour of the existing landscape will reduce the contrast between the Project and the existing landscape, reducing visual effect levels.

2.6.2 Reduce Visual Sensitivity

Visual sensitivity is reduced by carrying out treatments to minimise visibility of the Project. Due to the scale of open cut coal mining components, such as the Overburden Emplacement Areas (OEAs), screening is often most effective at or close to the point of viewing. Such screening treatments can also be used to redirect views to areas not affected by mining activities as well as generally enhancing the landscape at the viewing point.

2.6.3 New Visual Setting

On completion of mining operations and following rehabilitation, a new local landscape will be created. This new landscape will reflect pre-mining land.

3 EXISTING ENVIRONMENT

3.1 Introduction

This section of the report establishes the visual character of the Project and the surrounding landscapes that make up its visual settings. The existing visual settings of the Project are created by a range of different landscapes, which vary as a result of topography, vegetation cover and land use types. Based on visual differences created by these landscape elements, ten VCU were established.

These VCU were analysed in terms of their visual character within the primary view zone of the Project.

3.2 Regional Setting of the Project

The Project is located approximately 10 km north west of the village of Jerrys Plains and approximately 13 km south of the township of Muswellbrook in the Upper Hunter Valley of NSW. The Golden Highway is located south of the Project Boundary and provides access throughout the region from Jerrys Plains to Denman and then on to Merriwa and Dubbo. Edderton Road, a minor rural road that currently runs through EL 5460, links the Golden Highway with Denman Road to the north.

The Wollemi National Park is situated approximately 10 km south of the Project Boundary. This park forms the largest wilderness area in NSW and is part of the recently declared Greater Blue Mountains World Heritage Area (DECCW, 2009).

There are numerous small creeks which drain the area and feed into the larger creeks (see Figure 1.1). The main water courses are Saddlers Creek, a low flow creek, and the Hunter River, which is a regulated river and flows constantly providing water to the majority of the agricultural and industrial (Power Stations, Mining Operations, etc.) pursuits in the area. All of the other smaller creeks are ephemeral. The Hunter River is located to the south of the Project Boundary and meanders from north west to south east.

The Project area comprises the central reaches of the Saddlers Creek catchment area. Saddlers Creek flows in a south easterly direction, eventually discharging into the Hunter River to the south west of the Project Boundary. Plashett Dam, located to the south east of the Project Boundary, was specifically built to supply water to the nearby Bayswater Power Station. It is situated on Saltwater Creek which only flows during times of dam discharge into the Hunter River.

The topography of the Project area consists of moderate undulating foothills to steeply sloping hills over open paddock grazing land. The topographic elevation ranges from approximately RL 100 m near the Hunter River to RL 200 m where a distinct ridgeline dissects the Project area in a north east to south west trend. The land surface within the Project area is primarily cleared, open paddock grazing land, with minimal tree cover and good grass cover.

The ground adjacent to Saddlers Creek is flat; however, away from the creek bed, the land is undulating to hilly, with slopes between 20% and 30%.

3.3 Visual Study Area

The Project components associated with the existing Drayton Mine will not be changed from what is currently approved. As such, views of the existing Drayton Mine have not been included in this Visual Impact Assessment.

The VSA for this assessment includes the most significant parts of the total visual catchment from which the Project could potentially be seen. It covers an area of approximately 190 km^2. At a regional scale, the VSA is defined by the north facing escarpment of Wollemi National Park to the south. To the north-west are Ogilvies Hill and associated ridges, spurs and foothills. To the north the visual study area is defined by the ridges, spurs and foothills rising to the distinctive peak of Mt Arthur. The distant low ridgeline that runs north south from Plashett Knob defines the eastern boundary of the visual study area.

The VSA represents the area within which the majority of critical views of the Project are located. It is the critical part of the visual catchment. The VSA does not enclose all view points, but a consideration of those within it will achieve proper visual assessment of the Project. The VSA is illustrated in Figure 3.1.

Wollemi National Park is a regionally significant landscape at the edge of the VSA. Its steep heavily wooded escarpment and plateau contrast significantly with the predominantly cleared lowland at its base within the VSA to the north. This elevated conservation area with its folded steep topography and isolated knolls and ridges creates landscape of high visual interest.

Local landscape features include Saddlers Creek that flows in a south westerly direction, eventually discharging into the regionally significant Hunter River to the south west of the Project Boundary. This creek line flows across the Project area in a north east to south west direction through gently rolling grassed grazing land.

Saltwater Creek further to the south east is the outlet to Plashett Dam, a purpose built reservoir to servicing Bayswater Power Station. Bayswater Power Station is located within the Saltwater Creek catchment to the east of the Project. This creek flows into the Hunter River during times of dam discharge.

These meandering creek lines and the adjoining riparian vegetation bands are landscape features that contrast with the gently rolling grassed hills interspersed with wooded hills that dominate the VSA.

3.4 Visual Character of the Landscape

The visual character of the regional and local landscape in the vicinity of the Project is created by the mosaic of topographic form, vegetation and land cover, the Hunter River, Saddlers Creek and various land use patterns. These landscape features combine in various ways to create areas of relative visual uniformity that can be defined as VCUs. The VCUs combine in various vistas that are obtained from viewing locations such as residences and roadways.

Figure 3.1 illustrates the VCUs within the VSA, which include the:

- Creek Lines VCU;
- Hunter River Flood Plain VCU;
- Slopes and Hills VCU;
- Forested Hills VCU;
- Southern Escarpment VCU;
- Thoroughbred Horse Stud- Coolmore VCU;
- Thoroughbred Horse Stud - Woodlands VCU;
- Vineyard VCU;
- Village VCU; and

- Mine and Infrastructure Area VCU.

3.5 Creek Lines VCU

This VCU contains two main creeks within the VSA; Saddlers Creek and Saltwater Creek. The central reaches of Saddlers Creek, which flows in a south westerly direction, eventually discharges into the Hunter River to the south west of the Project Boundary (see Figure 3.2).

Saltwater Creek, which drains much of the mine site area, flows into Plashett Dam, located to the south east of the Project Boundary. The lower landscape along the original creek lines and flood plain are now within the dam extent. Saltwater Creek only flows during times of dam discharge into the Hunter River.

There are also numerous creeks draining the mine area to the west of Plashett Knob that feed Saltwater Creek.

The water elements of these creeks have only ephemeral or localised foreground effects. More significant visually are the remnant riparian River She Oak / eucalypt woodlands that adjoin these meandering creek alignments.

The VCU create minor visual features in the landscape and visual backdrops to many of the adjoining open fields and grazing croplands. Their visual effect in the landscape is limited, with the potential exception of Plashett Dam.

3.6 Hunter River Flood Plain VCU

Rural cropping lands for the greater part adjoin the river flood plains of the Hunter River. Visually the VCU is dominated by the expansive flats that by virtue of soils and irrigation, support cropland. This croplands results in vivid rectilinear patterns, (Figure 3.3) between the riparian woodlands along creeks and the river and the dry-land grass and woodlands on adjoining slopes and hills (see Figure 3.3).

The Hunter River generally runs west to east in the VSA but meanders significantly along the southern edge of the site. The river is fed by two creek systems, Saltwater Creek and Saddlers Creek.

The VCU is relatively flat and the grass / crop cover allows for long views from the cleared rural lands to the surrounding ranges.

There are a number of scattered rural residences within and at the edges of the VCU. However most of these residences are within the thoroughbred studs of Woodlands and Coolmore.

The significance of the unit is the open views it gives to more distant locations. In addition the rectilinear character of the verdant green, the improved pastures and crops create focal interest and form a major visual feature of the VSA as a contrasting centre piece of many landscape settings enclosed by the drier grassland slopes and forests of surrounding slopes, hills and mountains.

3.7 Slopes and Hills VCU

The slopes and hills generally occur between the cropping lands and forested hills, rocky hills and / or surrounding ranges. The gentle to moderate slopes are generally cleared and maintained as grazing land. The dry-land grass areas generally have some degree of tree cover. This cover can vary from scattered trees to scattered clumps of trees, but grassland is the dominant land cover (see Figure 3.4).

This unit is the most common in views of the rural landscapes, including views towards the project boundary.

3.8 Forested Hills VCU

These hills include Ogilvies Hill to the north-west and Plashett Knob to the east. To the north is a range associated with Mt Arthur. Foothills rise from 200m to the distinctive peak of Mt Arthur at an elevation of 483m, enclosing landscapes to the south. The range comprises a series of lesser knolls and ridges in the range of 300 – 350m running east to west of Mt Arthur (see Figure 3.5).

The forested hills are mainly around the perimeter of the site but areas of open woodland are scattered throughout the VSA. Many of these hills lie close to the Golden Highway, which runs along the southern boundary of the site. The topography has gentle to moderate slopes that rise from the surrounding slopes and hills with elevations in the vicinity of 150m to 240m along the Plashett Knob ridge.

The forest is highly contrasting in colour and texture to that of the surrounding paler grasslands accentuating its visibility as a landscape element.

The forest cover creates a highly contrasting colour texture backdrop against which mine operations will be viewed. The limited elevation of the forested hills limits their visibility to surrounding locations. The forested slopes adjacent to the Golden Highway boundary near the thoroughbred horse studs within the VSA create a visual boundary to view sheds to the north. The forested hills are a visual background feature of the VSA.

3.9 Southern Escarpment VCU

The southern escarpment defines the southern and south western edge of the VSA. It consists of very steep escarpment, plateaus, ridges and knolls of the northern extent of the Wollemi National Park, that rise from 100m at the Hunter River floodplain to 640-700m. The steep slopes support open eucalypt and cypress forests. The ranges contrast with and enclose the landscapes to the north and create dramatic visual backdrops to them.

The visual significance of the escarpment is that it often creates the background to valley views from a full range of view locations and as discussed frequently acts as visual barriers to long distance views. It is a major visual feature of the VSA (see Figure 3.6).

3.10 Thoroughbred Studs VCU

The Upper Hunter region has a long history of rural land use. One of the current dominant land uses adjacent to the Project Boundary is thoroughbred horse breeding and associated rural residential areas.

The Project is in close proximity to two of the premier thoroughbred horse studs in NSW – Coolmore Stud and Woodlands Stud. Coolmore Stud is located to the south of the Project. Darley Australia owns and operates Woodlands Stud, which is located immediately to the west of Coolmore and to the south west to the Project (see Figure 3.1).

3.10.1 Thoroughbred Horse Stud - Coolmore VCU

This thoroughbred horse stud presents irrigated grazing lands of lush green and distinctive timber post and rail fences and stock yards which creates an attractive rural landscape with high visual appeal when viewed from the Golden Highway. This river flat landscape is contrasted by gentle enclosing hills with dryland grass and scattered tree cover that exist on

the property on the northern edge of Apple Tree Creek (see Figure 3.7). There are mature exotic tree plantings associated with roadside landscapes along stud property perimeters and entrances as well as along internal roads. Trees are also planted along many horse paddocks, reinforcing the rectilinear pattern of the horse stud landscapes and differentiating it from other Flood Plain VCU areas. Again these contrast with the more random pattern of the native remnant trees on the rolling hills in surrounding VCUs.

Associated with the stud are a number of residential properties and administration infrastructure as well as numerous cottages. These also have maturing tree cover around the houses. Such locations include heritage residences such as Ellerslie and Strowan. Some of these houses are located on hill slopes with a northerly aspect and with views towards the Project.

The internal roads also give access to a number of lookouts at elevated locations within the property.

The Coolmore VCU creates distinctive landscape settings that add to the visual quality of the region and locality. The area as a whole is likely to have high sensitivity, particularly major use areas, roads and residences and administration buildings.

3.10.2 Thoroughbred Horse Stud – Woodlands VCU

The Darley owned Woodlands Stud presents as lush, green grazing land. Its entrance is announced with quality post and rail rural fencing and gateway signage, creating an attractive rural landscape from the Golden Highway.

This stud has a more varied topography than that of the Coolmore VCU, with local and regional ridge lines within the property perimeter. Internal roads provide access to rocky outcrops which provide higher vantage points and lookouts to surrounding landscape views (see Figure 3.8).

The lush undulating irrigated grazing land character of this stud contrasts with surrounding dryland grass associated with the Slopes and Hills VCU.

There are mature tree plantings along the Golden Highway roadside and along several internal roads. Trees are also planted along many horse paddocks reinforcing the rectilinear pattern of the horse stud. Again these contrast with the more random pattern of the native remnant trees on the rolling hills. Scattered remnant trees cover the hills near Trig Hill and its associated ridge line.

An extensive rural residential complex is located south of the Hunter River, along with stockyards, staff cottages and administration infrastructure. A manager's residence is located further north and at a higher elevation, closer to the northern entrance to the stud. Both residences either have views away from the Project or have views interrupted by internal ridgelines.

The Woodlands VCU creates distinctive landscape settings that add to the visual quality of the region and locality. The area as a whole is likely to have high sensitivity, particularly major use areas roads, lookouts, residences and administration buildings.

3.11 Vineyards VCU

Surrounded by the grazing lands of Woodlands and Coolmore Studs is the Hollydene Estate vineyard, a commercial enterprise that has operated a small scale winery and restaurant. The vineyard consists of a knoll covered by the tiers of vine rows generally following the hillside contours and local topography. These vineyards create a textured patchwork visual appearance on the landscape interspersed with mature remnant vegetation (see Figure 3.9).

The winery cellar door and administration and function facilities are located at the top of the hill with a north easterly outlook towards the Project. Mature planted trees surround the buildings and scattered trees cover a portion of the undeveloped area of the estate.

Hollydene Estate is a distinctive landscape setting that adds to the visual quality of the region and locality. It has previously been a tourist destination and commercial operation that is likely to have high sensitivity values due to its proximity to the Project.

3.12 Village VCU

The historic village of Jerrys Plain occurs in the south eastern corner of the VSA. The village is set in the Slopes and Hills VCU immediately adjacent to the Hunter River Flood Plain VCU (see Figure 3.1). The village streets are set out in a grid pattern off the Golden Highway that passes through the village. The village typically consists of the main street along the highway and streets with large residential blocks supporting houses and out buildings and scattered tree growth (see Figure 3.10).

The village is a visual feature of the region and for the greater part retains its village integrity. It represents an area of high sensitivity.

3.13 Mine and Infrastructure VCU

There are existing coal mines and power stations in close proximity to the Project and partially within the VSA. They include Mt Arthur Coal Mine, Hunter Valley Operations Mine, Drayton Mine and Bayswater Power Station. The visual character and scale of the existing Drayton Mine, the adjacent Mt Arthur Coal Mine and the Bayswater power station are strong enough to create a VCU based on the visual character of the mines (see Figure 3.11).

The VCU contains active mine areas, overburden emplacement and mine infrastructure facilities including Coal Handling Facilities, truck loading facilities and haul roads. It also contains significant infrastructure elements associated with Bayswater Power Station including cooling towers and emissions stacks. The mine and infrastructure areas create a large scale industrial landscape that contrasts with the surrounding forested hills and the agricultural landscapes of the foot slopes and flood plains.

The existing mine and infrastructure areas is a visual feature of the VSA and wider region, reflecting the scale of this land use activity. This VCU creates a visual context for the Project, being visible from some elevated south-western locations and roadways in the VSA. Other nearby mining areas are outside the VSA and therefore do not contribute directly to the visual settings of the Project. However, they are part of the seen continuum of a number of journeys along roads in the locality.

3.14 Summary

The various VCUs within the VSA create a diverse range of visual settings and views. The forested hills create minor visual features within the landscape, contrasting strongly with the pale coloured gentle slopes of cleared grazing land. They also often create visual screens to and within the Project Boundary. In this regard, the forested hills within the Project Boundary are especially significant.

Coolmore and Woodlands Thoroughbred Horse Studs both have visually appealing rural landscape settings with high vantage points on ridge lines and hills within their perimeters that have a broader range of viewpoints than the lower, flatter and more undulating slopes and hills.

The southern escarpment is a very significant visual landscape feature creating a highly appealing and strong visual backdrop to the south and defines the visual catchment in that location.

The slopes and hills within which the Project Boundary is situated is a gentle landscape that has restricted broader views due to its limited topographic relief. The surrounding topographic features as well as riparian vegetation along various creek fronts obscure views to the Project Boundary.

All the VCUs interact visually to create various landscape settings as seen from a range of viewpoints. They create the total view as well as screening or providing view corridors to the Project.

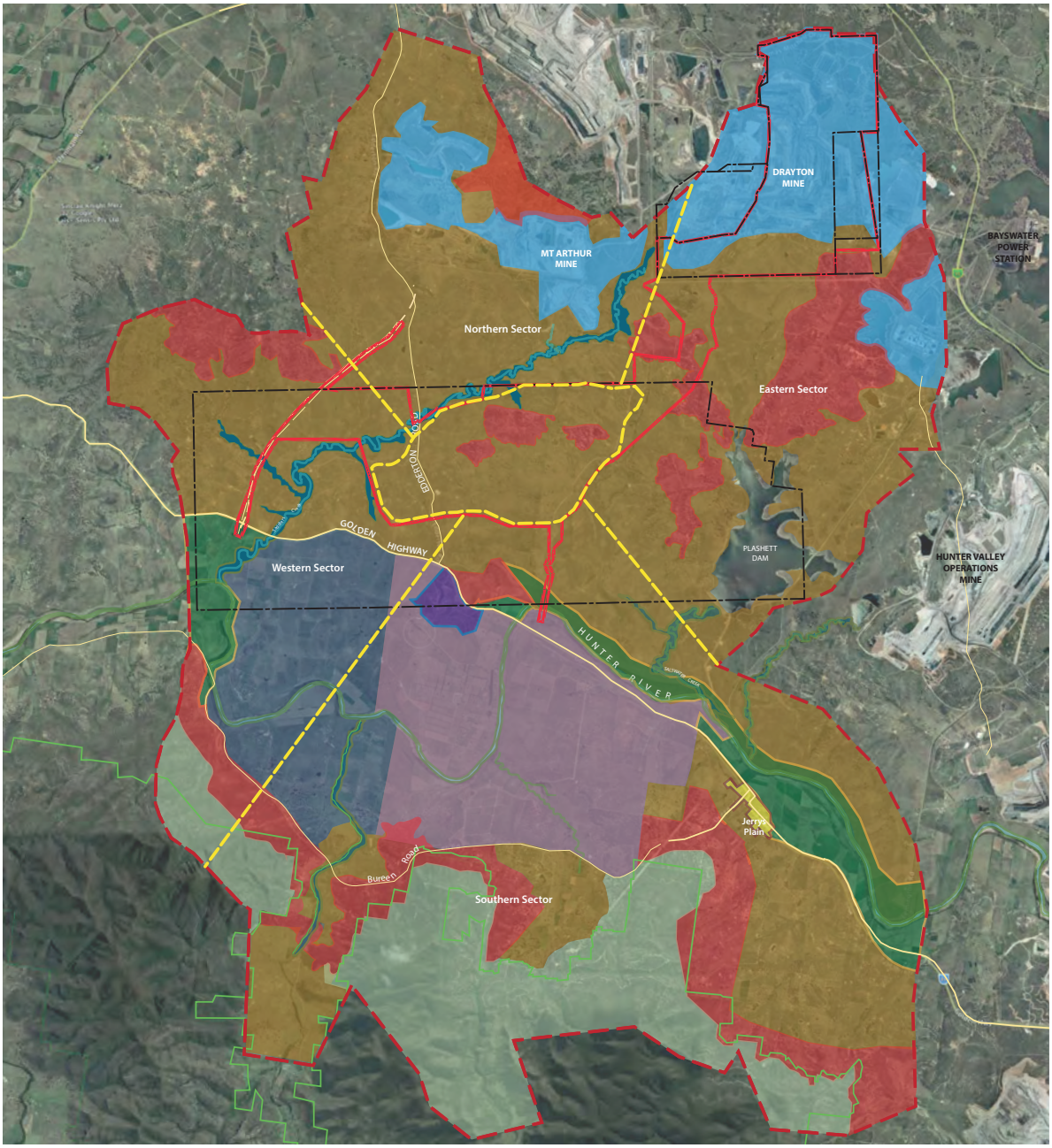


Figure 3.1 | *Visual Study Area*

The visual settings of the Project are created by a range of landscapes with different topography, vegetation, and land use features. Considered together, these create a number of distinctive visual character units (VCU). Many VCUs are naturally seen in any one view.

Figure 3.2 | *Creek Lines VCU*

This VCU defines the lower lying drainage catchment within the surrounding undulating grazing lands. The River She Oak woodlands define the creeks and water ways in the landscape and often act as visual barriers to more distant views.

Figure 3.3 | *Hunter River Flood Plain VCU*

Cropping lands dominate this VCU creating a strong open large scale and small scale rectilinear pattern of great visual diversity. The VCU is generally backdropped by the Slopes and Foothills VCU adding visual interest to the views of the flood plain.

Figure 3.4 | *Slopes and Hills VCU*
The undulating country is generally cleared with scattered tree cover.

Figure 3.5 | *Forested Hills VCU*
Forested hills include gentle to moderate slopes with topographic features that often create visual screens to the Project.

Figure 3.6 | *Southern Escarpment VCU*
The Southern Escarpment VCU dominates the southern horizon and creates spectacular backdrops to local landscape settings within the visual study area.

Figure 3.7 | *Coolmore Thoroughbred Horse Stud VCU*

The horse studs and residences within the visual study area are limited mostly to the southern side of Golden Highway with numerous rural properties and houses adjacent the highway.

Woodlands Stud front gate on the Golden Highway.

Views north towards Mt Arthur and east from Woodlands Stud lookout.

Figure 3.8 | *Woodlands Thoroughbred Horse Stud VCU*
Woodlands Stud has several higher vantage points with views of high visual appeal.

Figure 3.9 | *Vineyards VCU*

This VCU is limited to a small area adjacent the Golden Highway and is surrounded by Coolmore and Woodlands Horse Studs. It is a commercial enterprise and tourist destination.

Figure 3.10 | *Village VCU*
Towns and villages create focal points in the landscape as well as local settings, with built elements contributing to the foreground of a view.

The main visual elements of mines to external view are the OEAs. The visual effect of rehabilitated OEA is similar to the existing landscape while pre-rehabilitated OEAs contrasts strongly with it.

Regional infrastructure such as power stations are highly visible elements in the landscape. The visual effect of these type of facilities contrast strongly with the rural character of surrounding lands.

Figure 3.11 | *Mining and Infrastructure VCU*

4 THE PROJECT

4.1 General

This section of the report considers the various components of the Project in relation to their potential visual effect. Each of the components will have varied visual effects on the surrounding landscapes based on their visual character, scale and their interaction with the adjoining landforms and landuse.

Components of mining operations are generally large in scale. However there are differing levels of visual effect on external viewing locations. It is significant that the Project is designed such that new open cut mining areas and OEAs fall to the north of the limit of disturbance recommended by the PAC in their assessment of the previous Drayton South application (behind the second nominated ridgeline limit). These limits are defined by a prominent screening ridgeline that runs along the southern boundary of the Project. This ridgeline is an advantage in visual impact management as it shields all views of the Project from the horse studs 'primary areas of operations'.

The Project will operate over a period of 15 years. To be able to evaluate the visual effects of the Project over time, conceptual staged development plans have been established at Year 4, Year 6, Year 12 and at its rehabilitated final landform stage (see Figure 4.2- Figure 4.5).

4.2 Project Components

The Project is described in this section in the context of its visual implications. In relation to the visual effects of the Project, the various components of the development can be divided into major and minor elements. Major elements have the potential for higher visual effect in relation to external views. Minor elements, although not insignificant in horizontal scale, have a less significant visual effect due to lack of vertical scale and visual projection or visibility outside the Project Boundary.

Both the major and minor components already occur within the existing environment because of the already established Drayton Mine, Mt Arthur Coal Mine and Hunter Valley Operations.

Major mine components include:

- Active mine areas; and
- OEAs.

Minor mine components include:

- Mine site facilities;
- Haul roads;
- Transport corridor and related infrastructure;
- Water management infrastructure;
- Realignment and upgrade to parts of Edderton Road; and
- Progressive rehabilitation of disturbed areas.

Both the major and minor mine components associated with Project are shown on Figure 4.1.

4.3 Major Mine Components

The major visual components of the Project and their progressive development over the life of the mine are discussed in the following sections.

4.3.1 Active Mining Areas

Physical Character

In Years 1 to 3, initial excavations and overburden from the open cut mine area of Whynot will be used to establish overburden emplacement areas (OEAs) along the northern and north-western extents of the mining area.

By Year 4, mining will be established and progressing within the Whynot and Blakefield mining areas (see Figure 4.2). Mining operations progress in a southerly direction.

By year 6, the Blakefield mining area has two active fronts. The original Blakefield open cut has progressed to its southern extent with an east facing active front and a new active mine area with a south facing active face developed further to the west. (see Figure 4.3).

The Whynot open cut has advanced south and has an active front approximately 3 km in length.

Year 12 sees further southerly progression of the Whynot mining area (approximately 2.5 km in length) (see Figure 4.4). Blakefield open cut has been decommissioned with all voids now replaced with rehabilitated OEAs.

Following the completion of mining activities in about Year 15, all open cut operations will cease and the final landform will be developed and rehabilitated (see Figure 4.5).

All mining operations remain behind the second ridgeline limit as recommended by the PAC for the previous Drayton application.

4.3.2 Visual Effect

The active mining areas consist of two significant components. These include the active open cut mining areas and the OEAs. The open cut highwall is generally below natural ground level as mining progresses and is therefore only visible to view points with higher elevations. The low wall is also often shielded by other mining elements and is not visible to surrounding areas unless they are distant elevated locations looking into the mining area.

The visual effect of the mining void is created by the colour of the raw earth and exposed rock contrasting with the surrounding landscape. The open mining face also creates strong form, shape and line characteristics that differ from the existing landscape. These effects decrease over distance and by atmospheric conditions such as cloud cover, backlight and heat haze.

Views into the active mining areas are limited by:

- Their location and their enclosure within the surrounding ridgelines to the east, south and west; and
- The location of the OEAs along the northern perimeter of the Project area and the surrounding ridgelines to the east, south and west.

To some extent, active mining areas could be visible to elevated views from Mount Arthur, Trig Hill and Ogilvies Hill, however these locations have limited visual sensitivity due to either their existing land use (mining landuse in the case of Mt Arthur and Trig Hill is located high in the back country on Woodlands Stud and is not considered to be a ‘primary area of operations’ for that enterprise) and limited access and viewing points (Ogilvies Hill). Views may also be

possible from the Wollemi Plateau. However, the visual effect is minimised by the significant distance from these viewing locations to the Project, with remote lookouts in the Wollemi National Park over 15 km away.

The open cut mining areas create a Category 1 Visual Effect (high visual effect (Visual Effect Level 1, Table 2.2); the area of primary view zone occupied by open cut areas then informs the level of visual effect in that category. This effect cannot be reduced until these areas are progressively rehabilitated following the completion of mining. However as stated above, active mining areas for the Project are visible to limited receptors in the foreground and middle-ground, so the Level 1 visual effect has limited significance. The visual effects and impacts to surrounding receptors as a result of active mining areas are discussed in Section 6.

4.3.3 Overburden Emplacement Areas

Physical Character

Sequential mining will commence in two separate and distinctive areas with each causing the establishment of separate OEAs; the largest associated with the Whynot open cut area. Ultimately, these OEAs will combine to form a continuous final landform within the extent of mine area (see Figure 4.5).

The initially developed OEAs are located to the north of active mining faces and are developed from north to south as open cut mining operations progress over the 15 year life of the Project.

By Year 4, the OEA associated with the Whynot mining area has a north facing front of approximately 3.75 km in length. It is contiguous with the OEA to the north-west of the Blakefield mining area which is approximately 1.75 km long at this stage of mine development. Progressive rehabilitation has commenced along the outer faces and lower slopes of the OEAs with approximately half the total disturbed area being rehabilitated.

In Year 4, the OEAs associated with the Whynot mining area will have elevations of approximately 226 mRL and 212 mRL (see Figure 4.2).

By Year 6, the OEAs which are developed behind the active mining areas present as a series of four near continuous landforms. These landforms are broken up only by three north-south haul roads which provide mining fleet access to the active mine areas.

By Year 6, the OEA is approximately 6 km along the outside northern length. The width of the OEA adjacent the Whynot mining area is approximately 1.2 km. The Blakefield OEA extends from the north to south, with the formation of an associated ridgeline in the OEA profile now located to the west of the active open cut face. The western area of Blakefield open cut activity has also developed by Year 6.

The total area of OEAs at Year 6 is approximately 178 ha. Rehabilitation cover accounts for approximately 70% of the total OEA. It is worth noting that where required, tree screens along the existing ridgelines located between the Project and receptors to the south and west will be planted prior to or during the Project construction phase. This will ensure that they become established prior to Project mining advancing to the south (see Figure 4.2 to Figure 4.5).

By Year 12, the OEA landform consists of three separate sections, the largest associated with the rehabilitated landform of the Blakefield mining area. The main OEA associated with Whynot open cut has advanced as mining activities in this area progress toward the south. The total area of OEA for the Project at this stage is approximately 153 ha, with rehabilitation covering approximately 84% of OEA surface area. Three main haul roads remain in place within the OEA landform to provide access to active mining areas.

All graded areas such as haul roads, water pipelines and infrastructure sites are proposed to

have full rehabilitation by the time final conceptual landform is achieved following completion of mining in Year 15 (see Figure 4.5).

4.3.4 Visual Effect

The OEAs will create strong contrasting form in the landscape, and will initially have a strong colour contrast before rehabilitation is established. This visual properties of the OEA face (Visual Effect Category 1, Table 2.2) will be reduced as grass cover is established, lowering visual effects to moderate and low (Visual Effect Category 2). Following the establishment of tree cover, the visual effect will be low as visual integration with the surrounding landform and vegetation is achieved (Visual Effect Category 3).

The OEA face will have a Category 1 visual effect (Table 2.2). However, there will be no areas of high visual effect experienced at sites of high visual sensitivity due to the location of the mine plan in relation to existing topography. However, there may be small areas (less than 2.5% of PVZ) of moderate to low visual effect levels for 1-2 years due to visual exposure to a pre-rehabilitated condition of the OEA. Again, these effects will be avoided or minimised by the progressive rehabilitation of the OEA outer faces and by ensuring ridgeline and roadside tree screen planting is implemented.

4.4 Minor Mine Development Components

The Project will utilise much of the existing Drayton Mine infrastructure (see Figure 4.1) including ROM hopper, crusher and stockpile area. As noted in Section 3.3, these facilities are approved under the current approvals of Drayton Mine and were not included in this impact assessment.

Coal from the Drayton South area will be transported to the existing Drayton Mine CHPP facilities by road along the transport corridor (see Figure 1.2). The minor mine development components considered as part of this assessment include:

- Mine site facilities;
- Transport corridor;
- Water infrastructure
- Power reticulation; and
- Realignment and upgrading a section of Edderton Road.

These components are considered minor because they are small in scale and are generally not visible beyond the Project Boundary from significant external viewing locations.

4.4.1 Mine Site Facilities

As the Project is an extension to the current mining operations at Drayton Mine, minimal changes are required to the existing surface facilities at Drayton Mine. The current administration office, bath house and workshops will be utilised for the Project. The only new facilities requiring development are the Project mine site facilities.

The proposed location of the Project mine site facilities is shown on Figure 4.1.

The mine site facilities area includes numerous built elements such as a workshop, offices, parking areas and storage areas. Most of these are generally small in scale and it is more the combination of the various infrastructure items contained in this area that must be considered.

The visual properties of these elements when considered collectively will be moderate to high and will create a Category 2 visual effect. The mine site facilities will only be partially visible to

select areas in the northern view sector (see Section 7.1) and will therefore reduce the visual effect levels in that category.

4.4.2 Transport Corridor

The Project includes construction of a transport corridor from proposed mining areas of Drayton South to the existing Drayton Mine CHPP. The dedicated transport corridor connects the haul road from the northern-eastern extent of the Project mining area to the existing Drayton Mine infrastructure and CHPP.

The road is a flat linear element at grade within the existing landscape. The cleared wide bare dirt road corridor will contrast in colour and texture with the surrounding rural landscape. However, it will be similar in visual character to many rural access roads in the surrounding rural landscape and will create a Category 2 visual effect.

4.4.3 Water Infrastructure

The water infrastructure consists of onsite drainage and water retention basins as well as overland water pipelines around the site and through the transport corridor, connecting to the existing Drayton Mine infrastructure area. There is also a water extraction and discharge pipeline to the Hunter River. All of these elements are at or below ground level (with the exception of dam walls) and therefore would have very little visual effect outside of the Project Boundary.

4.4.4 Edderton Road Realignment and Upgrade

The existing alignment of Edderton Road runs in a north south direction through the Project Boundary and as such will require realignment. The Edderton Road realignment proposes a route to the west of the existing Edderton Road (see Figure 4.1). The new two lane, two way sealed road will traverse existing grassed grazing lands and will be of similar character to the existing Edderton Road, and will therefore not add a new and highly contrasting visual element to this landscape. Post-construction, it will have a Level 2 visual effect and will result in low visual effect levels in most instances.

4.5 Mining Operations

The carrying out of the various mining operations proposed of the Project will have a visual effect in themselves. This effect is created by excavation of overburden, coal and the movement of this material by various types of machinery that include: light vehicles, excavators, tractors, bulldozers, large trucks and largest of all, the drag line. These are generally smaller scale elements, but these elements of the Project will have a visual effect where they are visible in the context of the landscape and mine setting they are located within. The visual effect of them would generally be restricted to areas that have views of the OEAs.

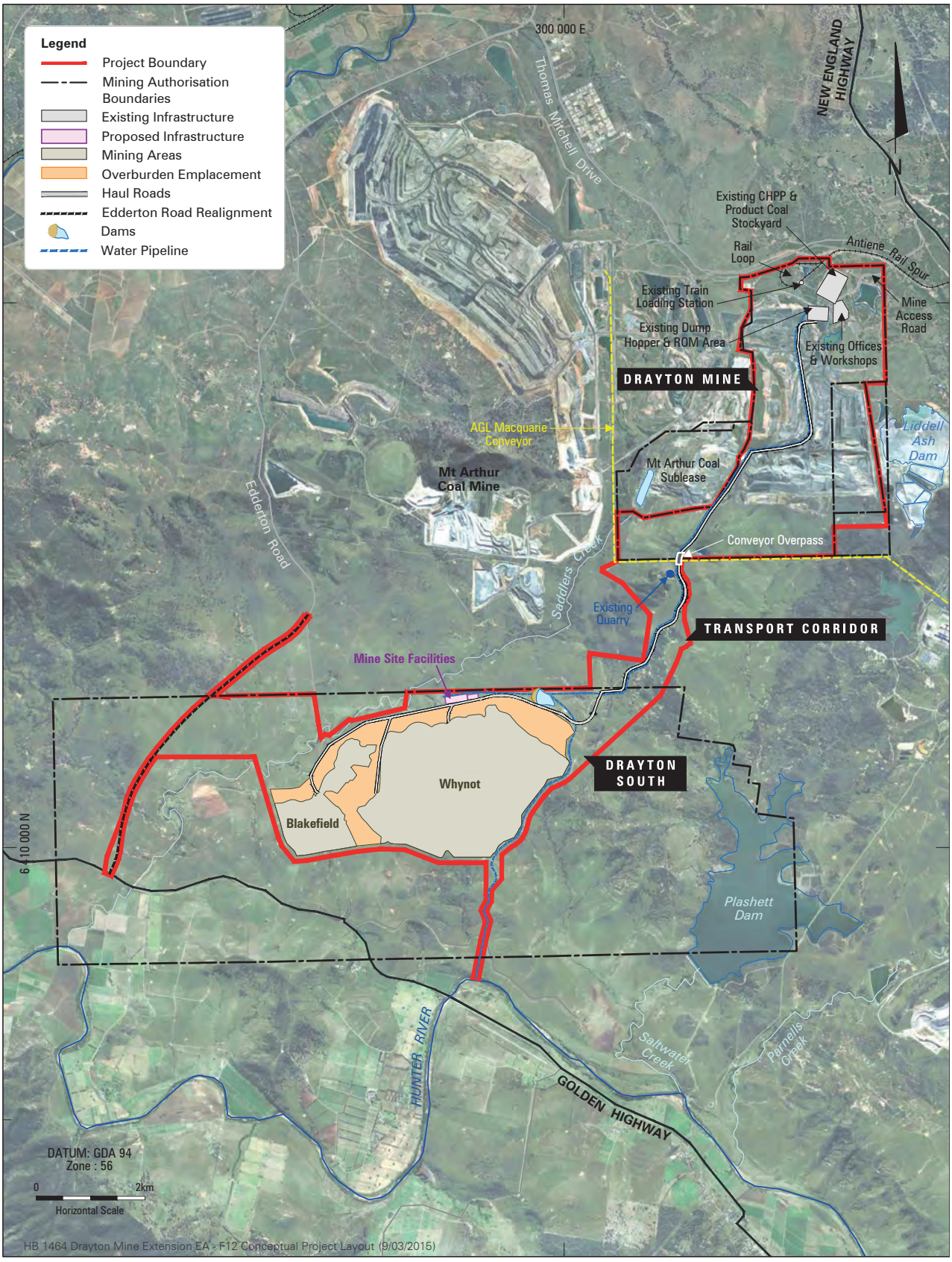
Indirect effects of mining operations where direct views are not available may include dust, and blasting. Indirect night lighting impacts associated with 24 hour operations could also create an off-site visual effect.

4.6 Summary

The development of the Project and more specifically the major mine components associated with it has the potential to create Category 1 visual effects in the context of the existing landscape.

However before the level of this effect from various viewing locations can be determined, the visibility of the various project components from external areas must first be defined (Section

5). Once the visibility is confirmed, the visual effect of the Project on these external viewing locations can be determined (Section 6).



Mine plan courtesy of Hansen and Bailey 2015

Figure 4.1 | *Conceptual Project Layout*

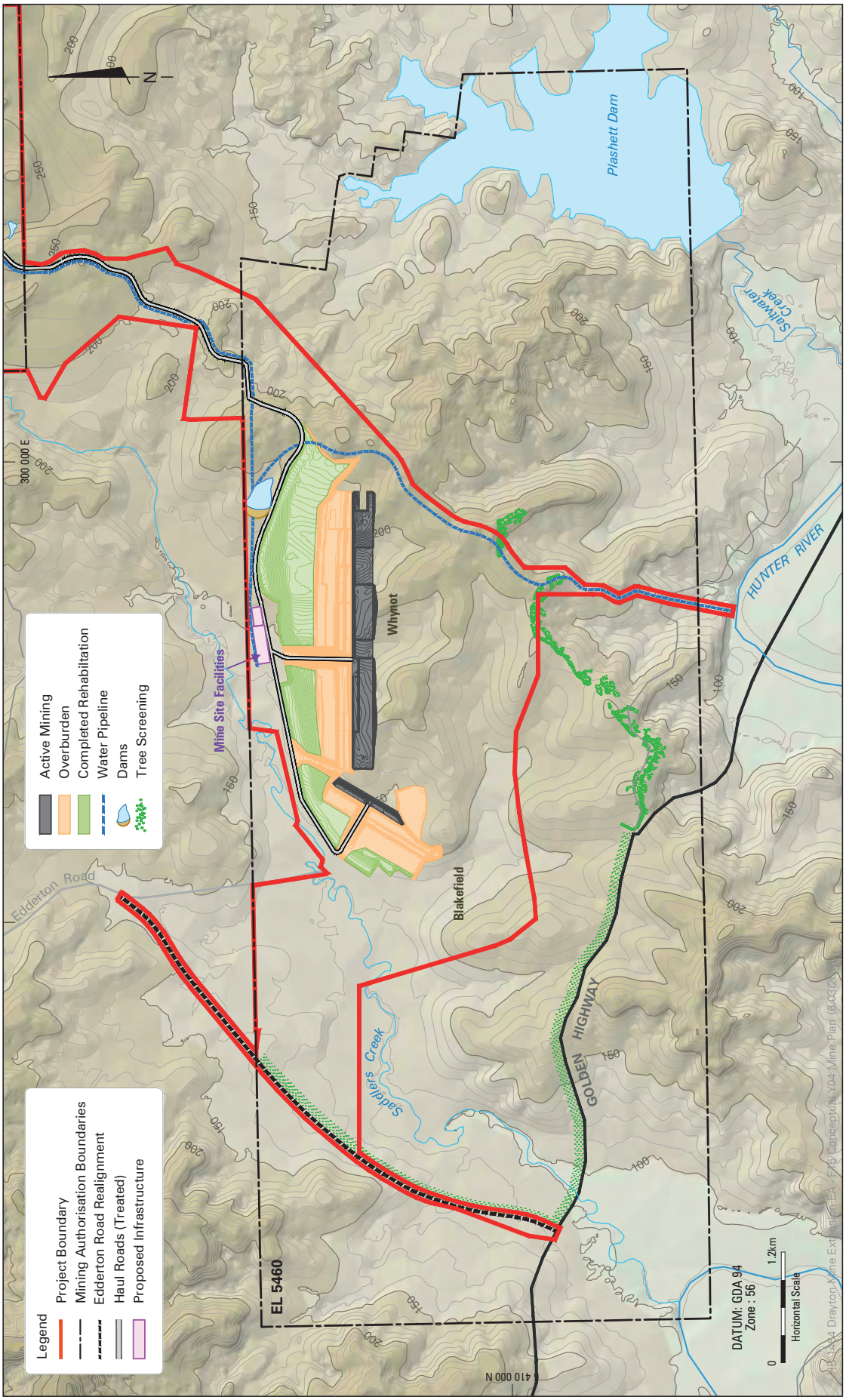


Figure 4.2 | *Conceptual Year 4 Mine Plan*

Mine plan courtesy of Hansen and Bailey 2015

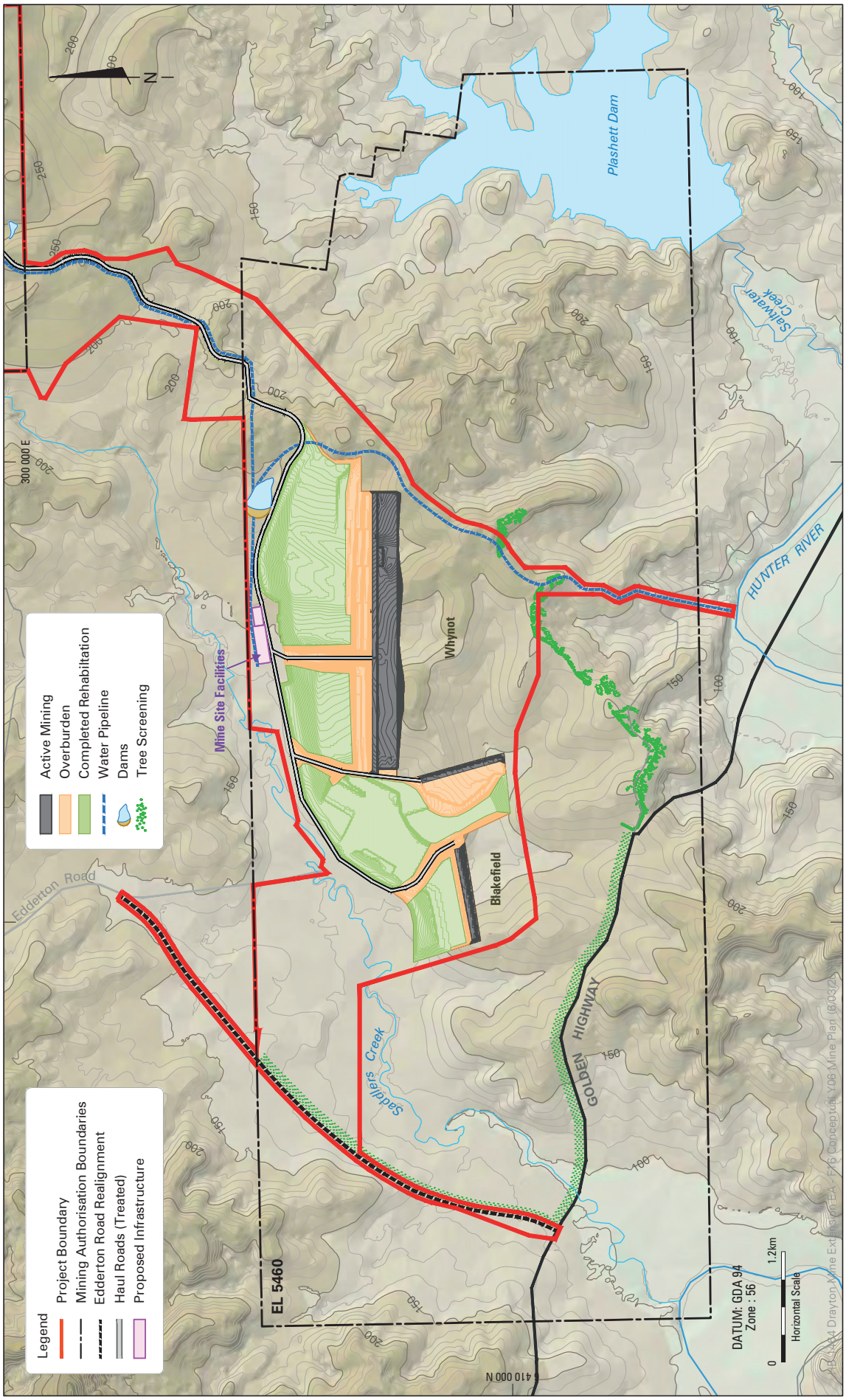


Figure 4.3 | *Conceptual Year 6 Mine Plan*

Mine plan courtesy of Hansen and Bailey 2015

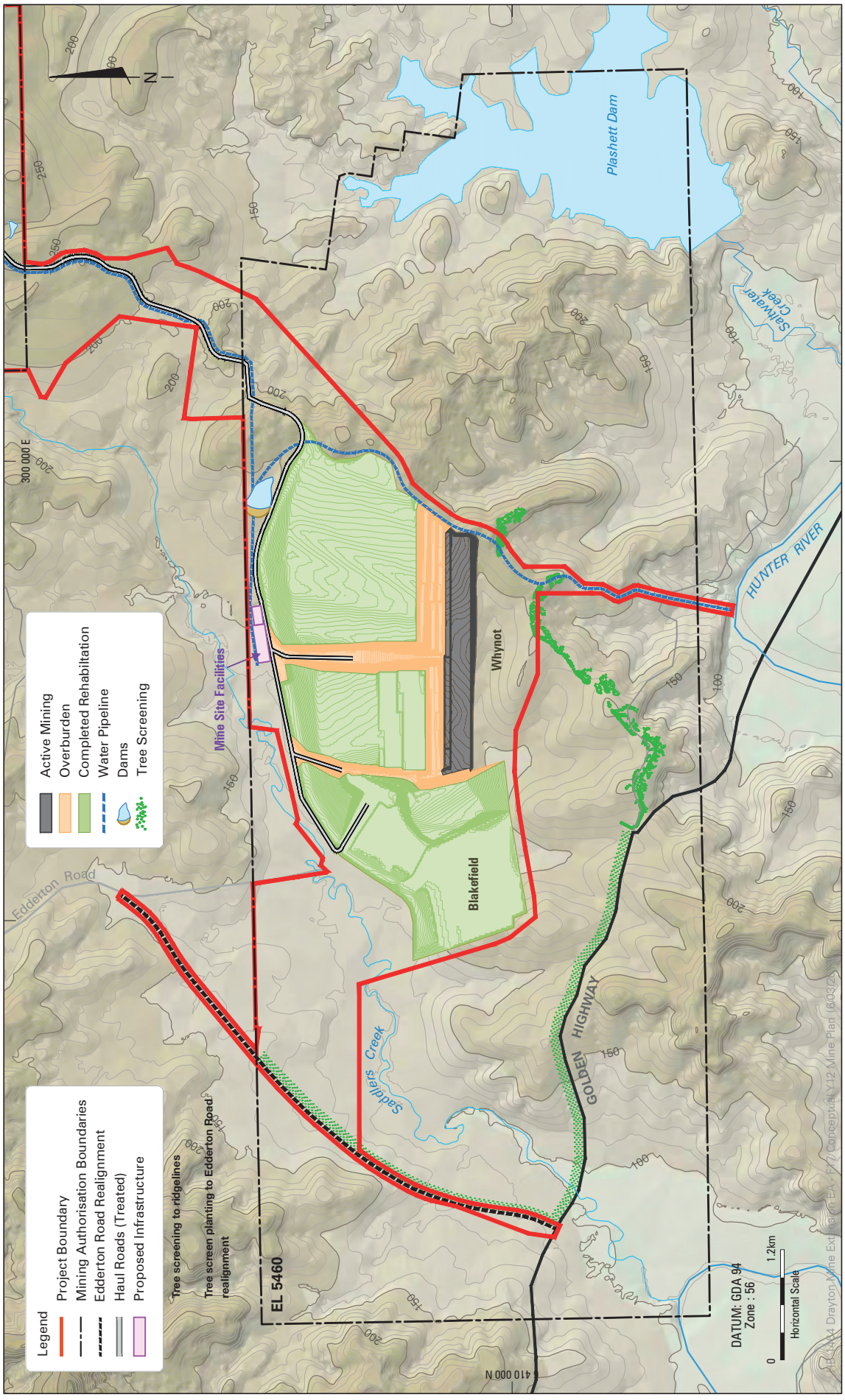


Figure 4.4 | *Conceptual Year 12 Mine Plan*

Mine plan courtesy of Hansen and Bailey 2015

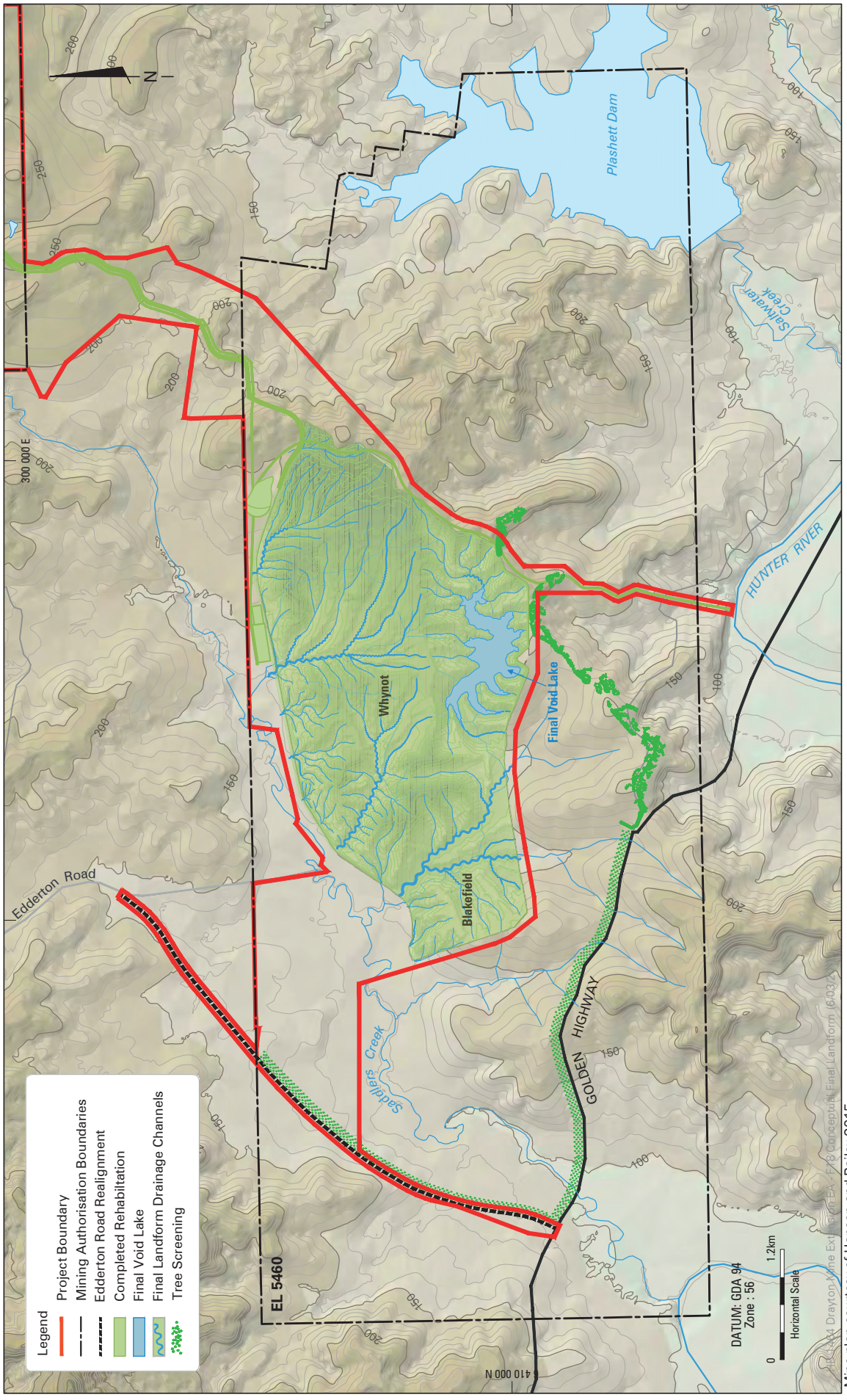


Figure 4.5 | *Conceptual Final Landform Plan*

Mine plan courtesy of Hansen and Bailey 2015

5 VISIBILITY AND VISUAL SENSITIVITY

5.1 General

This section of the report evaluates the visibility of the various elements of the Project from locations surrounding the Project Boundary. Visibility of Project elements will vary depending on a combination of topography and vegetation; especially foreground vegetation close to points of viewing.

The sensitivity of the various areas that have views of the Project will depend on the land use. Land use areas or activities that utilise the view, such as thoroughbred horse studs or private residences, will have a high sensitivity as discussed in Section 5.4. Conversely, areas such as unoccupied rural lands and land that is not used as part of a properties primary operations will have a low sensitivity. A consideration of sensitivity must be responsive to local conditions and current perceptions about the visual amenity aspects of a landscape, as illustrated through current views land use practices.

The determination of visibility and sensitivity give direction to potential mitigation strategies (Section 7) for any areas with high visual impact.

Field assessment and evaluation of mapping and aerial photography as well as computer analysis assisted in defining the VSA as shown on Figure 5.1. This area contains the most critical locations with potential views to the Project. To assist in an evaluation of this visibility, the VSA was divided into the Northern, Eastern, Southern and Western Sectors. The visibility of the Project from each of these sectors is described in Sections 5.4, 5.5, 5.6 and 5.7 below.

There needs to be visibility of at least one of the various mine components for a visual sensitivity and a visual impact to be incurred. Areas of surrounding land that do not have a view of the Project will not be directly impacted.

5.2 Visibility Considerations

5.2.1 Significant Topographic Features

There are a number of topographic features that greatly assist in limiting the visibility of mine areas, (see Figure 5.1These features limit views of the Project from the north, east, south and west in different ways.

To the north and north west of the Project, the hills and low ranges associated with Ogilvies Hill and Mt. Arthur define the visual boundary to northern views.

To the east, the distant low ridgeline that runs north-south from Plashett Knob assists in interrupting views from east of that ridgeline.

To the south and south-west of the Project there are a series of ridges and spurs north of the Golden Highway and define view sheds to varying degrees (see Figure 5.2). Potential views of the Project from the Golden Highway are therefore limited to the western and extremities of the Project.

Further to the south, the Wollemi National Park escarpment and associated wilderness areas limit views from areas outside the southern sector. The only potential exception would be any wilderness walkers that trek on to the extreme northern end of the Wollemi National Park plateau. However there are no accessible designated lookout points on any marked trail that would enable wilderness walkers to obtain distant views of the Project as well as existing mining operations at Mt Arthur and Drayton Mine.

To the west, there are extensive rural land areas, with limited sensitive receptors in that sector. A high ridge to the north-west which divides the Hunter River and Saddlers Creek catchments limits views into the Project. Views are also limited by the numerous low ridges and spurs in this sector on both sides of the Golden Highway in the vicinity of Woodlands Stud.

5.2.2 Significant vegetation areas

Tree cover is important in providing potential screening of the Project components. It is especially significant when it is close to sensitive viewing locations, as shown in Figure 5.3.

In addition to the screening effect of native woodland, especially that associated with the casuarinas and eucalypts along the creeks and drainage lines, cultural plantings around rural residences and villages also create screening effects. Cultural plantings and residual tree areas in the foreground or near middle ground can be significant in reducing views to the Project. Similarly, vegetation around residences or village streets can greatly assist in screening potential views to the Project (see Figure 5.4 and Figure 5.5).

5.3 Sensitive Receptors

There are a range of potentially sensitive viewing locations around the Project Boundary. These include the village of Jerrys Plains, the thoroughbred horse studs of Woodlands and Coolmore, Hollydene Estate, rural residences, roads and Wollemi National Park (see Figure 5.1).

5.3.1 Jerrys Plains Village

This village and houses are close to the Golden Highway and are the only cluster of residences and community facilities within the VSA. The village is unsighted to the proposed active mining areas.

5.3.2 Thoroughbred Horse Studs

Coolmore and Woodlands horse studs have a number of sensitive receptor areas within them. This is due to the visitation to the studs by existing and potential horse breeding customers and residences provided for employees. The high quality cultural landscapes created within the stud properties is testament to the value placed on the visual amenity of the horse breeding environments by their respective operators.

5.3.3 Hollydene Estate

Hollydene Estate is situated in close proximity to the Project on the southern side of the Golden Highway. A small vineyard and winery facility exists on the property. Hollydene Estate conduct wine, olive oil and produce tastings as a tourism attraction. Although the property includes a restaurant, winery and cellar door infrastructure, views of the Project are not available from this property, being shielded by ridgelines to the north of the Golden Highway.

5.3.4 Rural Residences

There are a limited number of rural residences spread throughout the locality (see Figure 5.5 and Figure 5.6). Most significant are those located to the south and south-west of the Project Boundary. All rural residences are unsighted to the Project.

5.3.5 Roads

The major road in the locality is the Golden Highway to the south of the Project Boundary. The other roads within the locality are generally minor rural roads (see Figure 5.7).

These roads include Bureen Road that runs east-west from Jerrys Plains to Denman, and Edderton Road which intersects Denman Road approximately 10 km south west of

Muswellbrook and runs in a north to south direction to the Golden Highway.

5.3.6 Wollemi National Park

Wollemi National Park to the south of the VSA is a recreation area of regional recreational significance. There are no marked bushwalking trails in the northern parts of the park, but "wilderness walkers" sometimes venture to the northern parts of the forested plateau. There would also be bush fire control trails through the park and within the southern extents of the VSA.

5.4 Visibility and Visual Sensitivity of the Northern Sector

The view sector is illustrated in Figure 5.1. This sector is dominated by low sensitivity rural lands, Mt Arthur and the telecommunications tower and existing mining operations of the Mt Arthur Coal Mine. Creek line vegetation associated with Saddlers Creek also influences this sector.

5.4.1 Mt Arthur

Mt Arthur's distinctive single peak and communications tower dominates the northern skyline of the VSA. Surrounding this peak are several existing open cut mining operations. From this view point at the communication tower there will be views into the Project approximately 5 km to the south, however the visual effect will be diminished due to existing operations already in place as part of the view south.

The Mt Arthur lookout would have a low sensitivity due to the lack of public access to the site and views of existing mining development in the area.

5.4.2 Rural Residences

There are two rural residences located within this sector. The first property, Edderton Homestead, is located approximately 0.6 km to the north of the Project Boundary and east of Edderton Road. The second is further north adjacent the Mt Arthur mine water catchment dams to the west of Edderton Road. It is approximately 6.6 km from the Project Boundary and 8.3 km from the additional mining areas proposed for the Project.

Edderton Homestead is owned by Hunter Valley Energy Coal (HVEC) but is leased to a local farmer. The residence is occupied. On the basis of topography alone, Edderton Homestead would have views to the northern OEA and the Mine Site Facilities. However homestead landscapes as well as trees in adjoining fields will limit such views, resulting in a high visual sensitivity.

Local topography will screen views to the second residence "Bobbagullion": therefore that location will have very low visual sensitivity.

Views from residences closer than 7.5 km would have a high sensitivity with a moderate sensitivity being ascribed up to 12.5 km and a low sensitivity beyond 12.5 km.

5.4.3 Local Roads

There are local views to the Project from sections of Edderton Road (see Figure 5.8). The proposed realignment will increase the distance of those views. The road alignment transverses lower areas roughly parallel to Saddlers Creek and will be approximately 2.5 to 5 km from the Project and will have moderate sensitivity at that distance. Rolling topography, open woodland and creek line vegetation will screen some of the northern and western faces of OEAs as will the tree screens that are proposed to be planted along the eastern side of the realigned road as part of the construction process. However the final elevations of OEAs will be visible from some parts of the road.

Edderton Road would have a moderate to low sensitivity.

5.5 Visibility and Visual Sensitivity of the Eastern Sector

There are no rural residences to the east; however there are elevated locations at Plashett Knob, and the ridgelines north and south. Plashett Dam is also within the eastern sector. AGL Macquarie holds the majority of land ownership in this sector.

5.5.1 Plashett Knob and Ridgelines

These areas are not accessible to the public and are generally used for grazing activities. As a result, these areas have a very low sensitivity.

5.5.2 Rural Residences

The eastern sector contains no rural residential properties.

5.5.3 Local Roads

The roads within this sector are on private property within grazing properties or AGL Macquarie's land and are minor rural or industrial site roads. A single road crosses Plashett Dam in a north-south direction, linking the Bayswater Power Station to power generation infrastructure to the south on the banks of the Hunter River.

A minor rural road runs in a north-south direction on the east face of the Plashett Knob ridgeline. It accesses pastures in this sector and to the north. As it is on the east slope it has limited views of the mine site.

These roads would have very low sensitivity.

5.5.4 Plashett Dam

Plashett Dam supplies water to the Bayswater Power Station to the north-east. Water is pumped from the Hunter River via a pumping station on the Hunter River. It is situated to the east of Plashett Knob and ridges to north and south, which screen views of the Project site.

There is no recreational or tourist activity at Plashett Dam and no public access roads.

Plashett Dam would have very low sensitivity.

5.6 Visibility and Visual Sensitivity of the Southern Sector

This sector is dominated by the village of Jerrys Plains, rural lands associated with the Hunter River Valley including Coolmore Stud, Woodlands Stud, Hollydene Estate, scattered rural residences and local tourist roads as well as a significant section of the Golden Highway.

5.6.1 Jerrys Plains

The village of Jerrys Plains is located approximately 7.5 km to the south-east of the mining areas proposed for the Project.

Intervening topography, vegetation and other buildings within the village will screen all views from Jerrys Plains.

The village would have a high sensitivity for any areas that would have views to are within 7.5 km of the Project. However, the village is screened from views.

5.6.2 Hunter River Valley

The flood plain of the river is dominated by improved pastures and croplands. These are contained within a range of private properties with a significant area of this land within the

Coolmore and Woodlands horse studs.

There will be no visibility from these areas due to intervening topography.

5.6.3 Coolmore Stud

Coolmore Stud is located to the south of the Project. It contains a number of landscape areas that have different view characteristics and potential visibility to parts of the Project. It is recognised as being part of the Hunter Valley Equine CIC.

With the exception of a narrow strip of river flat lands between the Hunter River to the north and the Golden Highway, the majority of the property is to the south of the Golden Highway. Most of the Coolmore Stud land is located on the alluvial flats associated with the Hunter River. Adjoining these flats are rolling hills with increased elevation.

Most of the intensive stud use areas and the most sensitive receptors are on the low flat lands. This includes the Coolmore Stud office and reception building, many stud facilities and paddocks (see Figure 5.9). Adjacent to this on the lower parts of the adjoining low lying hills are many of the residences occupied by managers and workers families. These residences include many historic buildings such as Strowan Homestead.

There are some exceptions to the location of sensitive facilities at the lower elevations, including the stud manager's house on the back of Oak Range and the worker's accommodation buildings adjacent to Bureen Road, adjacent to the 'back gate' at the south of the Coolmore Stud property. In addition, there are roads that cross this higher terrain, specifically the Oak Range Road to the south of Strowan. Generally less significant dry land paddocks occur on these parts of the property as do other functional elements such as storage areas and the Coolmore quarry.

The rolling hills also support some lookouts, specifically at Batty Hill, as well as high points on internal roads such as Oak Range Road. The highest locations on the property are associated with the ridgeline on the western end of the Coolmore property. This ridge supports low sensitivity activities such as the Coolmore quarry and loading of cattle from the established cattle yards in this part of the property. This this broad acre rural area value has been assigned a low sensitivity.

There will be no views to open cut mining areas from Coolmore Stud's primary areas of operations as the current mine layout remains behind the ridgelines nominated by the PAC Review Report (December 2013).

However, Coolmore stud overall has been deemed to have high visual sensitivity due to the potential for indirect visual effects.

5.6.4 Hollydene Estate

Hollydene contains a small vineyard, a winery, cellar door and restaurant infrastructure. In addition, the property also supports a number of residences.

The facilities and residences associated with Hollydene have no views to the Project due to the screening effects of the southern ridgeline between Hollydene and the Project.

Views would be available from select high points on the back of this property. Given that these high points on the top of the ridgeline do not form part of the commercial areas associated with the winery or restaurant, they have been considered as broad acre rural areas and assigned a low sensitivity.

As such Hollydene will have a low sensitivity due to lack of visibility to the Project.

5.6.5 Residences

Excluding the numerous rural residences on Coolmore and Woodlands, rural residences in the remainder of the sector are limited. These residences are generally adjoining minor rural roads to the south of Bureen Road and are further than 7.5 km away.

Micro-topographic elements, existing vegetation and tree planting around many of the rural residences as well as their orientation reduce the visibility to the Project.

These residences would have a moderate to low visual sensitivity due to viewing distance to the Project and lack of visibility.

5.6.6 Roads

The Golden Highway traverses the southern sector from the south east corner to north west (see Figure 5.2). The southern ridgeline lies roughly parallel to the highway, obstructing direct views into the area of mining operations in this sector.

Views of the Project are limited by existing ridgelines and vegetation. Some limited views or glimpses of the Project may be possible in this area of the Golden Highway when travelling eastwards. However these will be eliminated by further plantings in this location.

Other local roads in the southern sector include Bureen Road and the minor Doyles Creek Road and Redmondvale Road. Bureen Road runs from Jerrys Plains west along the base of the Wollemi escarpment to Denman and is a minor tourist route.

The highway in this sector has high visual sensitivity due to its proximity to the mine. Other roads would have a low sensitivity based on distance and usage patterns.

5.7 Visibility and Visual Sensitivity of the Western Sector

This sector has a limited extent between the Project's western boundary and the Ogilvies Hill range some 7 km to the west. Rural grazing lands dominate the zone with some improved pastures along the Hunter River in the vicinity of Bureen Road and steep forested hills in the vicinity of Ogilvies Hill and the foothills of Wollemi National Park (see Figure 5.10).

The main sensitive receptors within the zone are Woodlands Stud, a small section of the Golden Highway, the realignment and upgrade to Edderton Road and a limited number of rural residences.

5.7.1 Woodlands Stud

Due to intervening natural topography there are no views from Woodlands Stud as all primary operational areas of the enterprise are entirely screened from the Project. The exception remains from limited locations along its eastern boundary along ridge lines radiating from Trig Hill. From such locations, the existing mining operations at Mt Arthur and Drayton are also visible. Given that Trig Hill does not form part of the primary operational areas associated with Woodland's thoroughbred breeding operations, it has been considered as a broad acre rural area and has subsequently been assigned a low sensitivity.

It is in fact this ridge that screens Woodland's primary operational areas from views. Even the most easterly view points on the property, including the elevated location of Bowmans Hill, do not have views of the operational areas of the Project. Other sensitive areas within the property that are screened from view include the administration office, the main entrance gate and entrance road, the Woodlands lookout, residences and staff quarters as well as most field areas.

There will be no views to open cut mining areas from the primary operational areas of

Woodlands Stud as the proposed mine layout remains behind the ridgelines nominated by the PAC Review Report for the previous Application (December 2013). This has been confirmed by the preparation of photomontages and section analyses from key viewing locations (see Section 6).

However, Woodlands stud overall has been deemed to have high visual sensitivity due to the potential for indirect visual effects.

5.7.2 Golden Highway

There are limited potential views from the highway when travelling east down from Denman Gap on the Ogilvies Hill Range. This roadway is screened from view by adjoining topography until approximately 1 km from Saddlers Creek. From here views continue to be limited by spurs associated with Trig Hill immediately to the east of the Creek; the mine layout remains behind this western ridgeline. The view zone is limited to approximately 500m before elevation is lost and complete screening by existing topography is achieved (see Figure 5.10).

The highway at this distance will have a moderate sensitivity, however views toward the Project will generally be screened by foreground vegetation and intervening ridgeline topography.

5.7.3 Rural Roads

The realigned portion of Edderton Road within the sector will have tree screens planting along to limit views to the Project where possible. Bureen Road to the south is generally screened from views.

At distances closer than 2.5 km Edderton Road will have a moderate sensitivity where views are available. Where locations are screened by trees and vegetation the sensitivity will be low.

5.7.4 Rural Residences

There are four rural residences in the western sector which are located on the easterly aspects of the footslopes of the Ogilvies Hill Range to the south of the Golden Highway. The two most easterly residences are too low on the slope to have views across the Trig Hill spur. The more elevated ‘Mayland’ and ‘Luloma’ properties would have views to the more elevated operational areas within Blakefield and Whynot mining areas. However views would be limited and are over 8 km away.

The ‘Glen Munro’ property north of the Golden Highway is screened by adjoining topography.

The rural residences will have a moderate sensitivity to views of the Project.

5.7.5 Rural Lands

The majority of the rural land is rolling grassed grazing land alongside Saddlers Creek as it flows from the north, and some forested hills rising to Ogilvies Hill in the north west of the sector.

The broad acre rural use has low visual sensitivity at distances over 2.5 km from the Project.

Ogilvies Hill at 468m is one of the highest topographic features in the immediate area and would have unimpeded views into the active mine site. Access to this lookout point is limited as it is on private land.

At a distance of over 2.5 km from the Project and very limited access, this vantage point has low visual sensitivity. 5.6.6

5.7.6 Roads

The Golden Highway traverses the southern sector from the south east corner to north west

(see Figure 5.2). The southern ridgeline lies roughly parallel to the highway, obstructing direct views into the area of mining operations in this sector.

Views of the Project are limited by existing ridgelines and vegetation. Some limited views or glimpses of the Project may be possible in this area of the Golden Highway when travelling eastwards. However these will be eliminated by further plantings in this location.

Other local roads in the southern sector include Bureen Road and the minor Doyles Creek Road and Redmondvale Road. Bureen Road runs from Jerrys Plains west along the base of the Wollemi escarpment to Denman and is a minor tourist route.

The highway in this sector has high visual sensitivity due to its proximity to the mine. Other roads would have a low sensitivity based on distance and usage patterns.

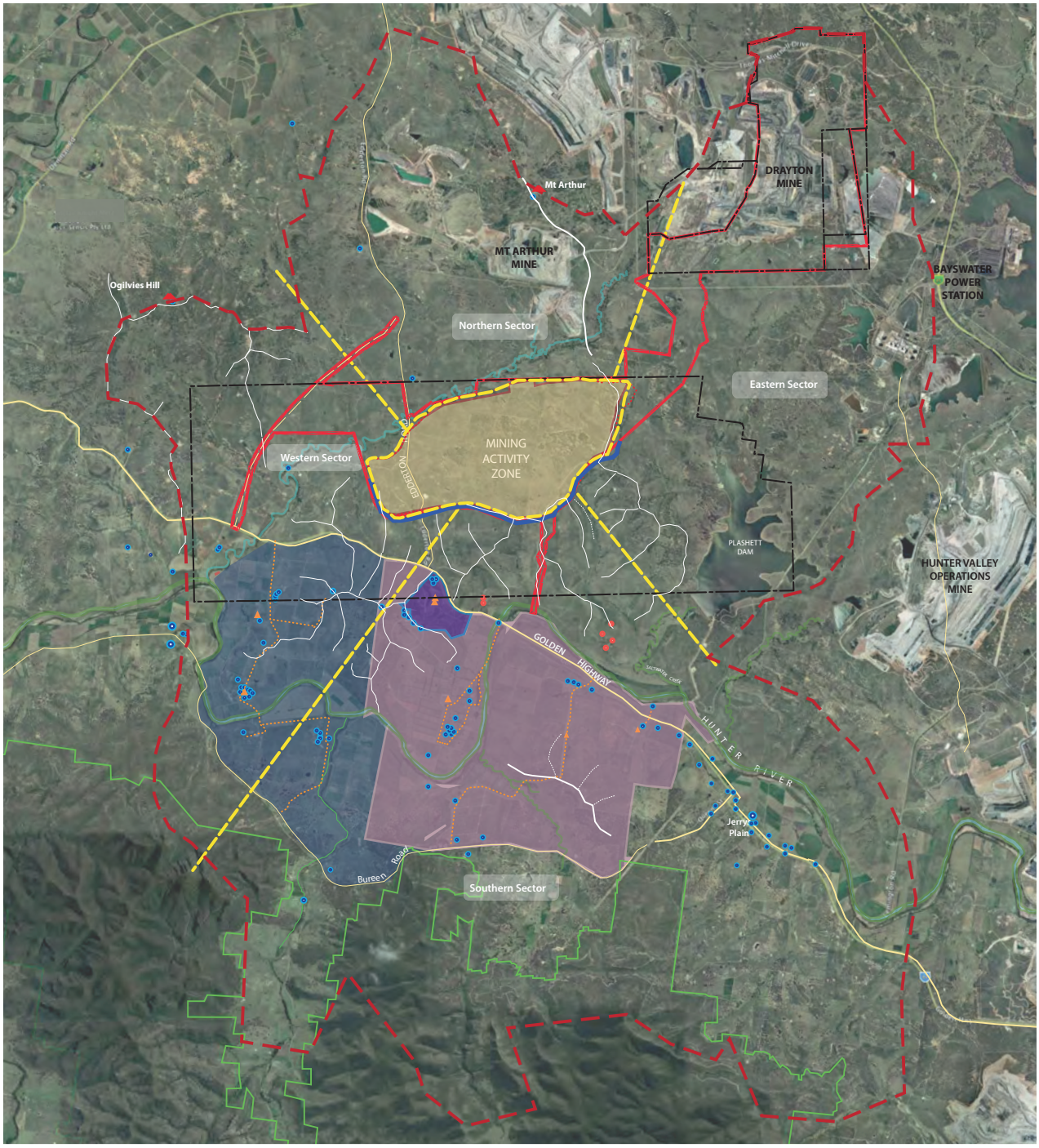


Figure 5.1 | *View Sectors and Sensitive Receptors*

Figure 5.2 | *Golden Highway from Coolmore Horse Stud - View to north-west*
Topographic features in foreground or near middleground of sensitive receptors are effective in screening views to Project areas.

Figure 5.3 | *Vegetation along Edderton Road*
Vegetation in the foreground such as a roadside is effective in screening views.

Gees Residence with screening vegetation between house and the Project Boundary.

Low ridgeline between the Project and Golden Highway provides screening of distant views.

Figure 5.4 | *Foreground Elements Screen Views*
Topography, trees and other vegetation can screen distant views.

Figure 5.5 | *Villages and Towns*

Buildings and tree cover within streets and gardens often screen views beyond the town edge.

Ellerslie Residence

Figure 5.6 | *Rural Residences*
Rural residences are sensitive receptors with visibility often depending on foreground gardens and view orientation.

Views along Golden Highway looking east towards the Project.

Views north-east from Bureen Road.

Views to the east towards the Project from Edderton Road.

Golden Highway near Coolmore Stud entrance.

Figure 5.7 | *Roads*

Roads have varying status and sensitivity reflecting the type of use of the road. Visibility often depends on roadside vegetation.

Edderton Road looking east towards the Project.

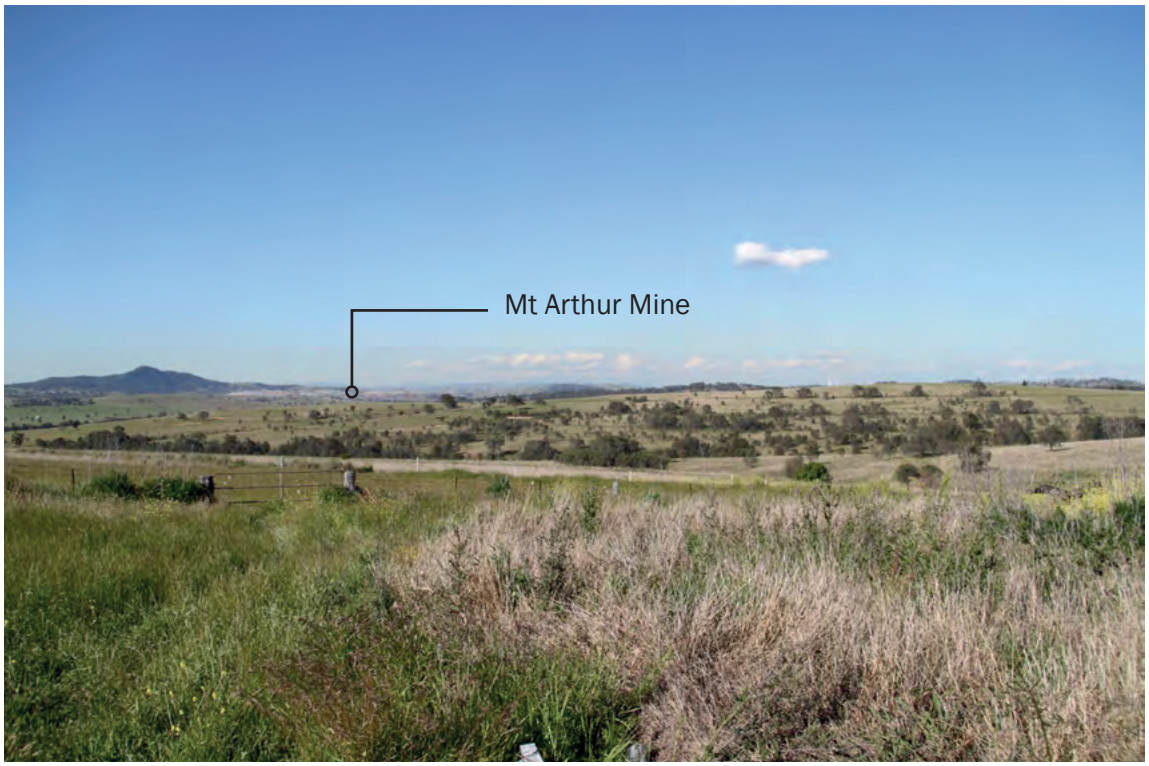
The sector is dominated by rural lands and existing mining operations. Edderton Road is within the northern view sector.

Looking north towards the Project from Coolmore Stud on Golden Highway.

Gateway to Coolmore Stud on Golden Highway.

Figure 5.9 | *Southern Sector*

The southern sector is dominated by sensitive land uses that include horse studs, a vineyard, the village of Jerrys Plains and rural residences.



Looking east toward the Project from high point on Golden Highway.

Figure 5.10 | *Western Sector*

The western sector also includes sensitive land uses in the form of horse studs, the Golden Highway and rural residences.

6 VISUAL EFFECT

6.1 General

The potential sensitive viewing locations (receptors) around the Project have been defined in detail in Section 5 of this report.

This section defines the visual effect of various project components on external view locations around the site. To assess the visual effects of project components on view locations around the Project, views were considered from the northern, southern and western sectors. As described in Section 5 no sensitive receptors or viewing locations are present in the eastern sector. The visual effects were considered from a number of representative viewing locations and have also been assessed through photomontage development. The representative viewing locations used in this assessment are shown in Figure 6.1.

The photomontage locations were selected to illustrate a range of typical views and worst case scenarios as seen from the various view sectors. The sites were selected from numerous sites where photography was taken along with GPS coordinates.

The level of visual impact on receptors is discussed in Section 7 based on the consideration of receptor sensitivity (Section 5) and visual effect (Section 6.2 - Section 6.4).

6.2 Photomontage Illustration of Visual Effect

The visual effects of the Project were evaluated in part by completing a photomontage analysis from various critical viewpoints. These locations, as illustrated on Figure 6.1 included the following representative locations for each of the following Sectors:

6.2.1 Southern Sector

- DS06 - Coolmore – Oak Range Road (top);
- DS13 - Coolmore – Oak Range Road (lower); and
- DS08 - Coolmore – Batty Hill.

6.2.2 Western Sector

- DS10 - Woodlands – Front Gate; and
- DS15 – Woodlands – Randwick Staff Quarters.

As there is limited visibility and no sensitive receptors in the eastern sector, no locations for photomontages were selected in this sector.

6.2.3 Southern Sector

DS06 – Coolmore – Oak Range Road (top)

This is a viewpoint of high sensitivity being a main internal road on the Coolmore Stud property where visitors are taken (see Figure 6.1). This view is higher than typical views from the more sensitive areas in the southern extent of the Coolmore Stud.

The existing view is limited by a low ridgeline to the north of the Golden Highway between the location and the Project and existing vegetation. The valley below contains parts of the Coolmore Stud VCU, Strowan residence and the Slopes and Foothills VCU. The anticipated visual effect levels for this location are described below for each of the representative years of the Project and are shown on Figure 6.4.

Year 4:

The upper mine limit is behind the intervening ridgeline and line of sight. Existing ridgetop trees further raise the sightline created by the intervening ridgeline along the view down Oak Range Road in direction of the Project. Other scattered trees in near and middle view on the Coolmore property filter views to the ridgeline from this view location. There is no visible change to the view from this location.

Year 6:

No visible change from previous views to ridgelines since Year 4. The upper mine limit is consistent across breadth of the Whynot mining area. No visible visual effect.

Year 12:

No visible change from previous views to ridgelines since Year 6.. No visible visual effect.

DS13 – Coolmore - Oak Range Road (lower)

The view is on Coolmore Stud at the northern end of Oak Range Road closer to Golden Highway and Strowan Homestead, looking to the north north west (see Figure 6.1). The view is from a less elevated location than DS06 (Oak Range Road (top)), with the same ridgeline lying between the viewpoint and the Project.

The anticipated visual effect levels for this location are described below for each of the representative years of the Project and are shown on Figure 6.3.

Year 4:

The upper mine limit is behind the ridgeline and line of sight. Existing ridgetop trees raise the sightline created by the ridgeline in the centre view in direction of the Project. There is no visible change to the view from this location.

Year 6:

Figure 6.3(c) indicates a small lift in upper limit of mining at the centre of the view. There are no visible change from previous views to ridgelines since Year 4 as the Project remains shielded behind the ridgeline.

Year 12:

FIgure 6.3(d) indicates additional small lifts to mine levels across the face of the Whynot mining area as it moves towards its southern extent. This analysis indicates one location will be within close vertical distance from the line of sight from this view location. However ridgeline tree screen planting will provide additional vertical visual buffer and ensure that all views within this critical zone are screened.

There will be no visual effects from views to mine from this sensitive view location.

DS08 – Coolmore – Batty Hill

This is a viewpoint of high sensitivity being a lookout on the Coolmore Stud where visitors are taken for an overview of the property. The existing view is limited by a low ridgeline to the north of the Golden Highway between the location and the Project (see Figure 6.1). The valley below contains the majority of the Coolmore Stud VCU. In the middle distance is the Golden Highway running left to right (west to east). The anticipated visual effect levels for this location are described below for each of the representative years of the Project and are shown on Figure

6.4.

Year 4:

The upper limit of mining is screened by the intervening ridgeline in this view. For part of this view, sightline cross sections indicate that mine activity in the Whynot open cut will be within close vertical distance from the line of sight from this view location at a distance of approximately 3.5 km. However ridgeline tree screen planting will provide additional vertical visual buffer and prevent views within this critical zone.

With the exception of initial growth of tree screens planted on the existing ridgeline, there will be no visible change to the view from this location.

Year 6:

The mine upper limit remains generally consistent with Year 4, being located behind the ridgeline, with no change to views from this viewpoint.

Year 12:

The upper limit from this viewing location remains consistent with previous years assessed. The ridgeline tree screen plantings will by this stage be over 12 years old and will continue to provide additional vertical visual buffer and prevent views within this critical zone There will be no visual effects created by mine activities from this view location.

6.2.4 Western Sector

DS10 – Woodlands – Front Gate

This view from Woodlands Stud front gate is on the Golden Highway looking north east towards the Project (See Figure 6.1). Views from this location look out across the Slopes and Foothills VCU towards parts of the Forested Hills VCU in the distance. A low ridgeline to the north of DS10 limits views from this location.

The anticipated visual effect levels for this location are described below for each of the representative years of the Project and are shown on Figure 6.5.

At all Stages Years 4, 6 and 12, the white line outlining the Projects upper limit indicates that there would be no views of the Project from this view location. Therefore there will be no visual effects from this sensitive viewing location.

DS15 – Woodlands – Randwick Staff Quarters

This viewpoint is located on the western extent of Woodlands Stud adjacent to residences and staff quarters, as such has high visual sensitivity. From this location looking north east, there are limited views over the Woodlands Stud VCU, with low hills and ridges in the middle distance limit views beyond this western part of the stud (refer Figure 6.6).

At all stages Year 4, 6 and 12 photomontage (outlining the Project's upper limit of mining) indicates that there would be no views of the Project and therefore no visual effects from this view location.

6.3 Line of sight and ridgeline analysis

Line of sight / topography modelling was undertaken at a number of viewing locations to determine the cross sectional profiles. These locations had previously been identified as sensitive viewpoints (refer to Figure 6.1) and included:

- DS03 - Jerrys Plains - Golden Highway;
- DS05 - Coolmore - Ellerslie Residences;
- DS06 - Coolmore - Oak Range Road (top);
- DS08 - Coolmore - Batty Hill;
- DS10 - Woodlands - Front Gate; and
- DS15 - Woodlands - Randwick Staff Quarters.

The profiles were then analysed to determine the margins between the line of sight and the highest limit of mining in relation to ridgelines and other landscape elements (see Figure 6.7 and Figure 6.8).

Parallel to this was the consideration of proposed mitigation screening which will increase the visual buffer and improve the visual absorption capacity of views toward the Project in some areas .

This analysis provides an evaluation model for determining the extent of the additional mitigation treatments that may be required to focus and maximise the screening effects.

6.3.1 DS03 - Jerrys Plains - Golden Highway

Viewpoint is over 7 km from southern extent of mine. Intervening ridgelines screen views of the Project at this location.

6.3.2 DS05 - Camp Ellerslie

Viewpoint is over 5.8 km from southern extent of mine. Intervening ridgelines screen views of the Project at this location.

6.3.3 DS06 - Oak Range Road (top)

Viewpoint is over 6.5 kms from southern extent of mine. Views are shielded at this location however the line of sight is within close vertical distance from the upper limit of mine operations at Year 12. The ridgeline tree screen plantings will by this stage be over 12 years old and provide additional vertical visual buffer to ensure that the project will not be visible from this location and will improve visual absorption capacity at this view location .

6.3.4 DS08 - Batty Hill

Viewpoint is approximately 3.5 km from southern extent of mine. There are two broad ridges between view location and the Project. Line of sight is within close vertical distance from the upper limit of mine operations at Year 12. The ridgeline tree screen plantings will by this stage be over 12 years old and provide additional vertical visual buffer as well as improved landscape amenity .

6.3.5 DS10 - Woodlands Front Gate

Viewpoint is approximately 2.7 km from southern extent of mining for the Project. The closest ridgeline located approximately 1 km to the south of this viewing location effectively screens views to the Project at this location.

6.3.6 DS15 - Woodlands Randwick Staff

Viewpoint is approximately 3.3 km from southern extent of mining for the Project. Undulating topography gently rising to the ridgeline at distance 2 km limits all views to the Project from this viewing location.

6.4 View Loss Assessment

The visual effect of view loss due to the Project has been considered. Due to the strong enclosure of the Project by existing topography, such potential is limited and localised to the area to the west of the new alignment proposed for Edderton Road.

At Edderton Road, foreground and near middle ground views of existing rural valleys would be screened by roadside plantings. The open view of this valley is typical of rural views and does not have any significant landscape features. Loss of this view is not considered significant (see Figure 6.9).

All other receptors are screened from views of the Project, are located within existing mine lease areas or are located in areas with land uses that have a low visual sensitivity.

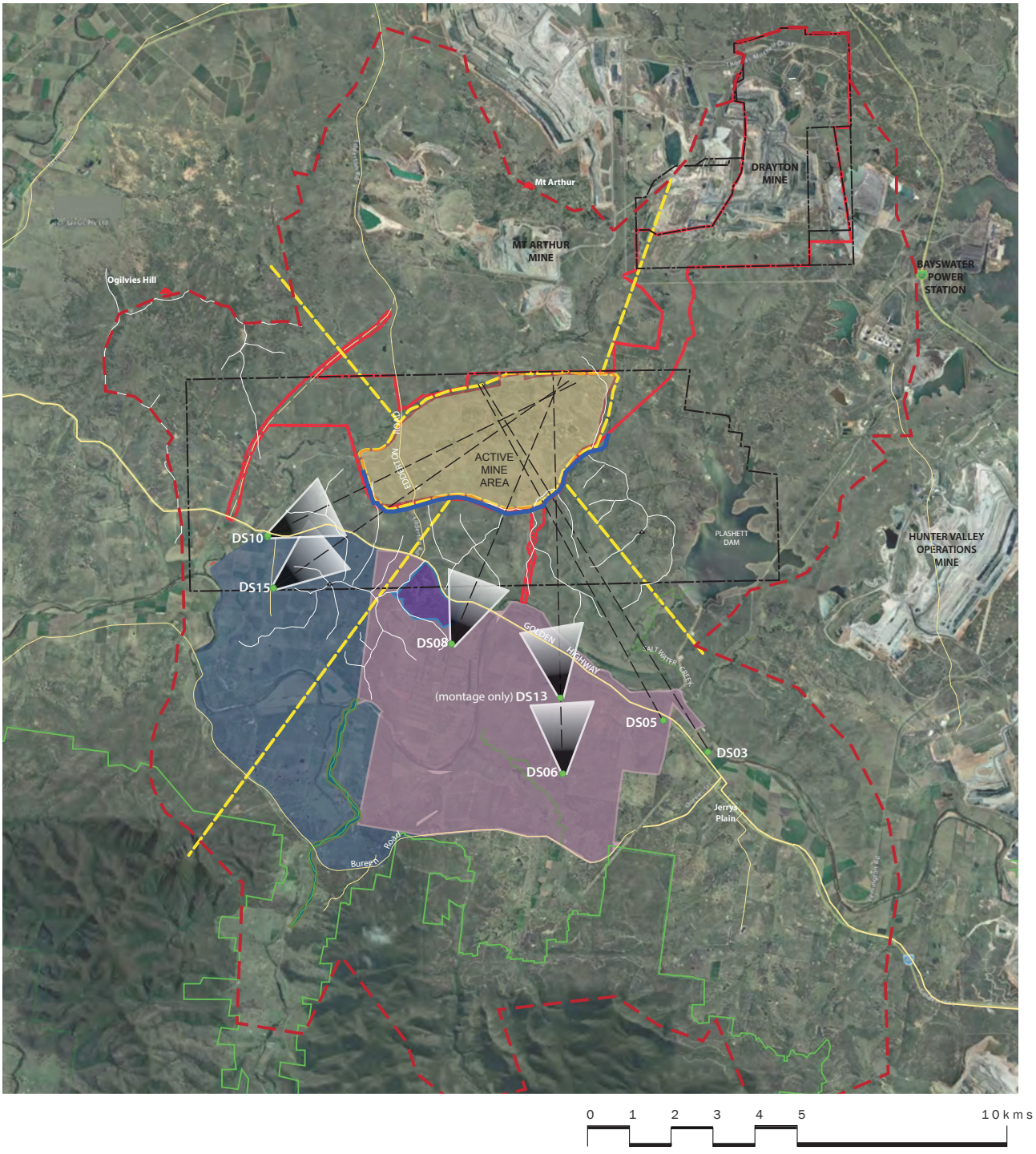
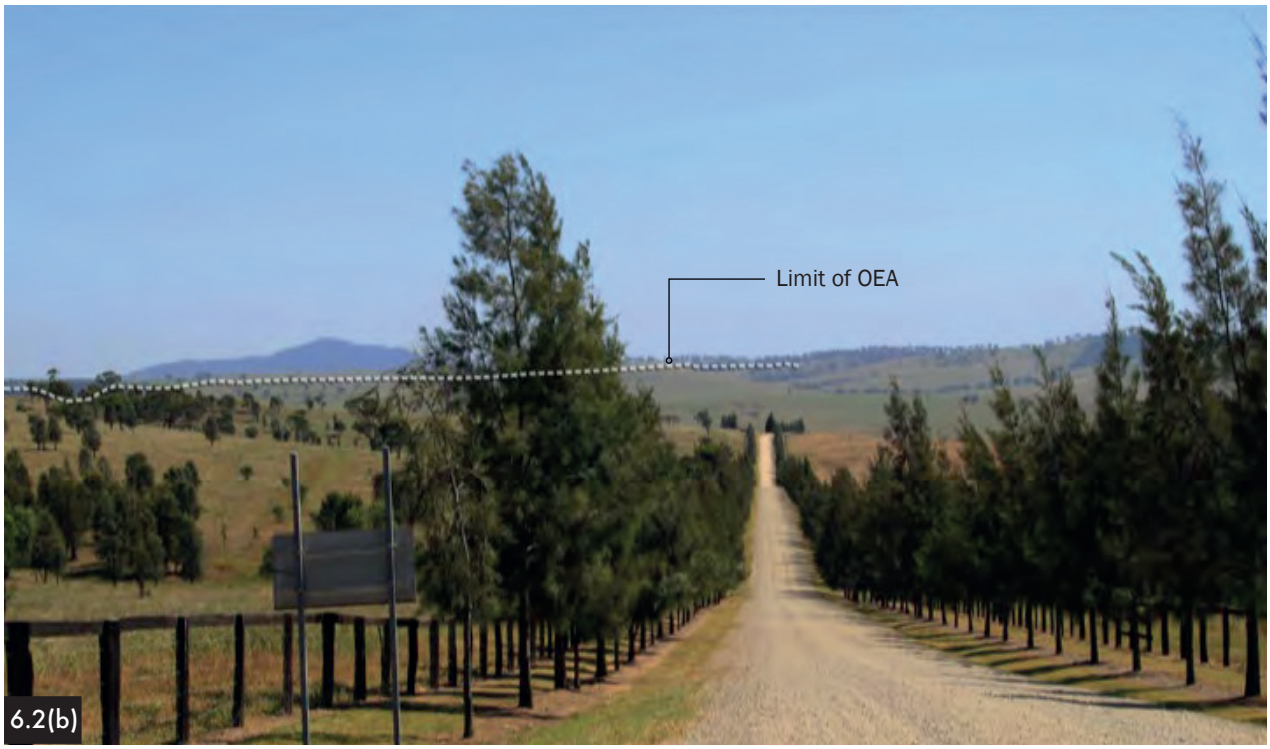


Figure 6.1 | *Photomontage Locations*

DS06 - OAK RANGE ROAD - (TOP)

EXISTING

MINING YEAR 4

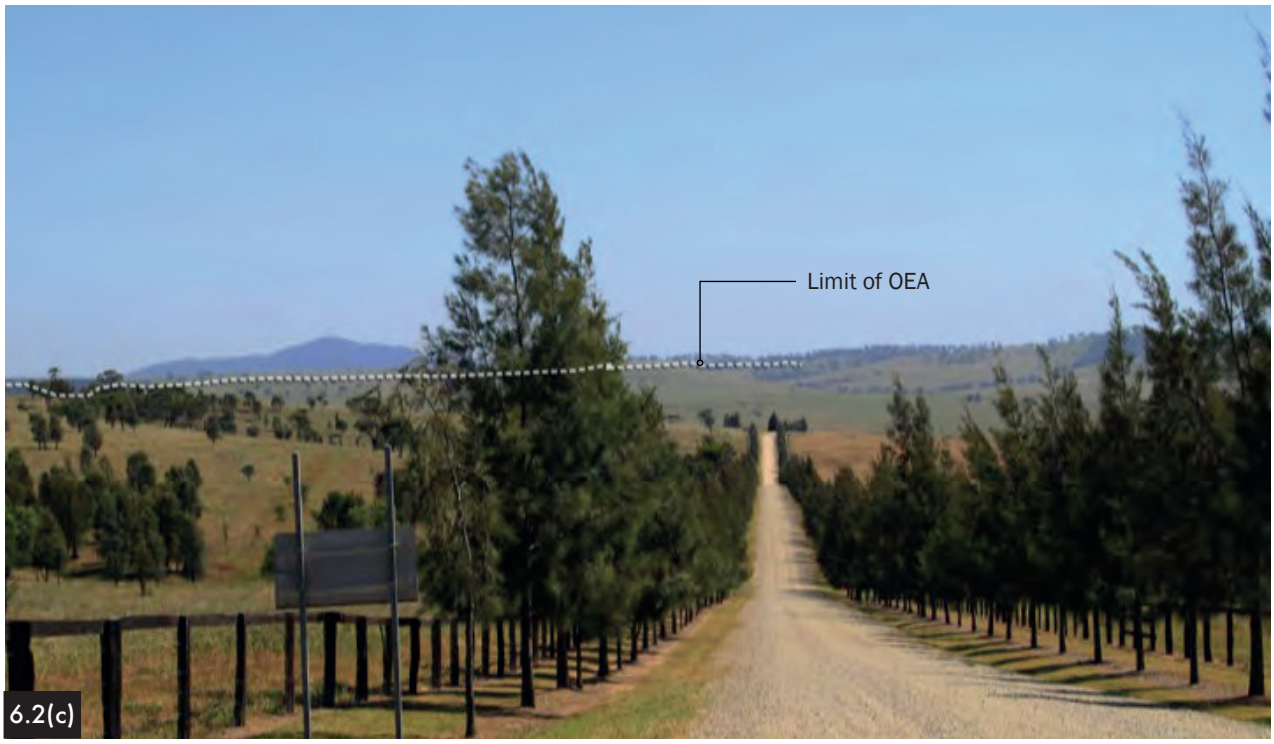


Dashed line indicates views are screened behind ridgeline.

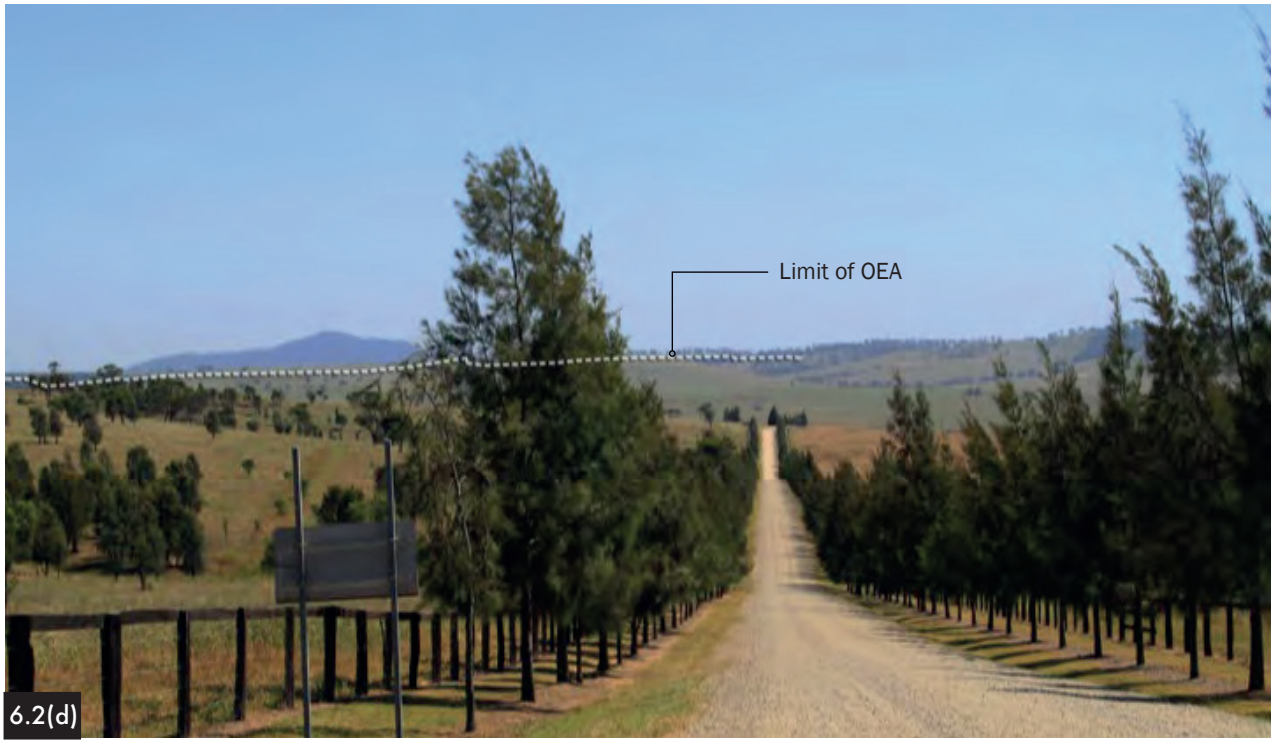
Figure 6.2 (a & b) | *Photomontage DS06 - Coolmore - Oak Range Road (top)*

DS06 - OAK RANGE ROAD - (TOP)

MINE YEAR 6



MINING YEAR 12



Dashed line indicates views are screened behind ridgeline.

Figure 6.2 (c & d) | *Photomontage DS06 - Coolmore - Oak Range Road (top)*

DS13 - OAK RANGE ROAD (LOWER)

EXISTING

MINING YEAR 4

Dashed line indicates views are screened behind ridgeline.

Figure 6.3 (a & b) | *Photomontage DS13 -Coolmore - Oak Range Road (lower)*

DS13 - OAK RANGE ROAD (LOWER)

MINING YEAR 6

MINING YEAR 12

Dashed line indicates views are screened behind ridgeline.

Figure 6.3 (c & d) | *Photomontage DS13 -Coolmore - Oak Range Road (lower)*

DS08 - BATTY HILL

EXISTING

MINING YEAR 4

Dashed line indicates views are screened behind ridgeline.

Figure 6.4 (a & b) | *Photomontage DS08 - Coolmore - Batty Hill*

DS08 - BATTY HILL

MINING YEAR 6

MINING YEAR 12

Dashed line indicates views are screened behind ridgeline.

Figure 6.4 (c & d) | *Photomontage DS08 - Coolmore - Batty Hill*

DS10 - WOODLANDS FRONT GATE

EXISTING

MINING YEAR 4

Figure 6.5 (a & b) | *Photomontage DS10 - Woodlands - Front Gate*

DS10 - WOODLANDS FRONT GATE

MINING YEAR 6

MINING YEAR 12

Figure 6.5 (c & d) | *Photomontage DS10 - Woodlands - Front Gate*

DS15 - WOODLANDS - RANDWICK STAFF QUARTERS

EXISTING

MINING YEAR 4

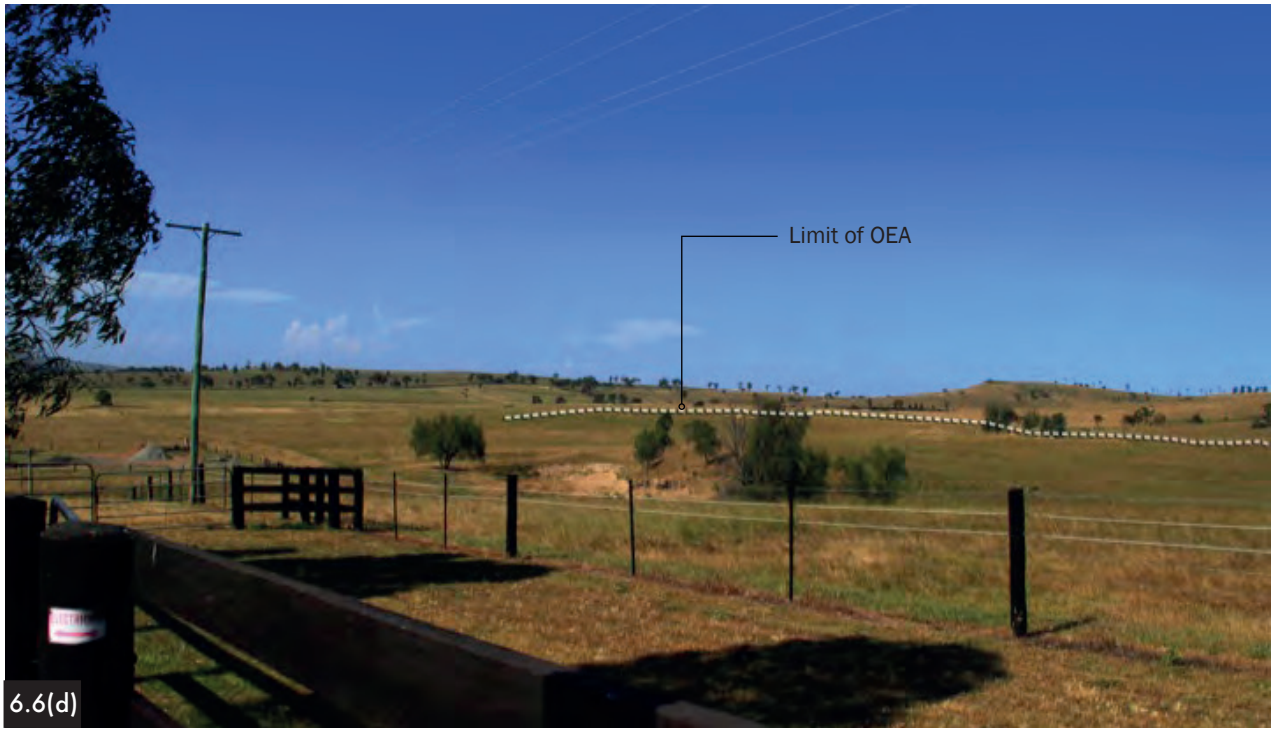
Dashed line indicates views are screened behind ridgeline.

Figure 6.6 (a & b) | *Photomontage DS15 - Woodlands - Randwick Staff Quarters*

DS15 - WOODLANDS - RANDWICK STAFF QUARTERS

MINING YEAR 6

MINING YEAR 12



Dashed line indicates views are screened behind ridgeline.

Figure 6.6 (c & d) | *Photomontage DS15 - Woodlands - Randwick Staff Quarters*

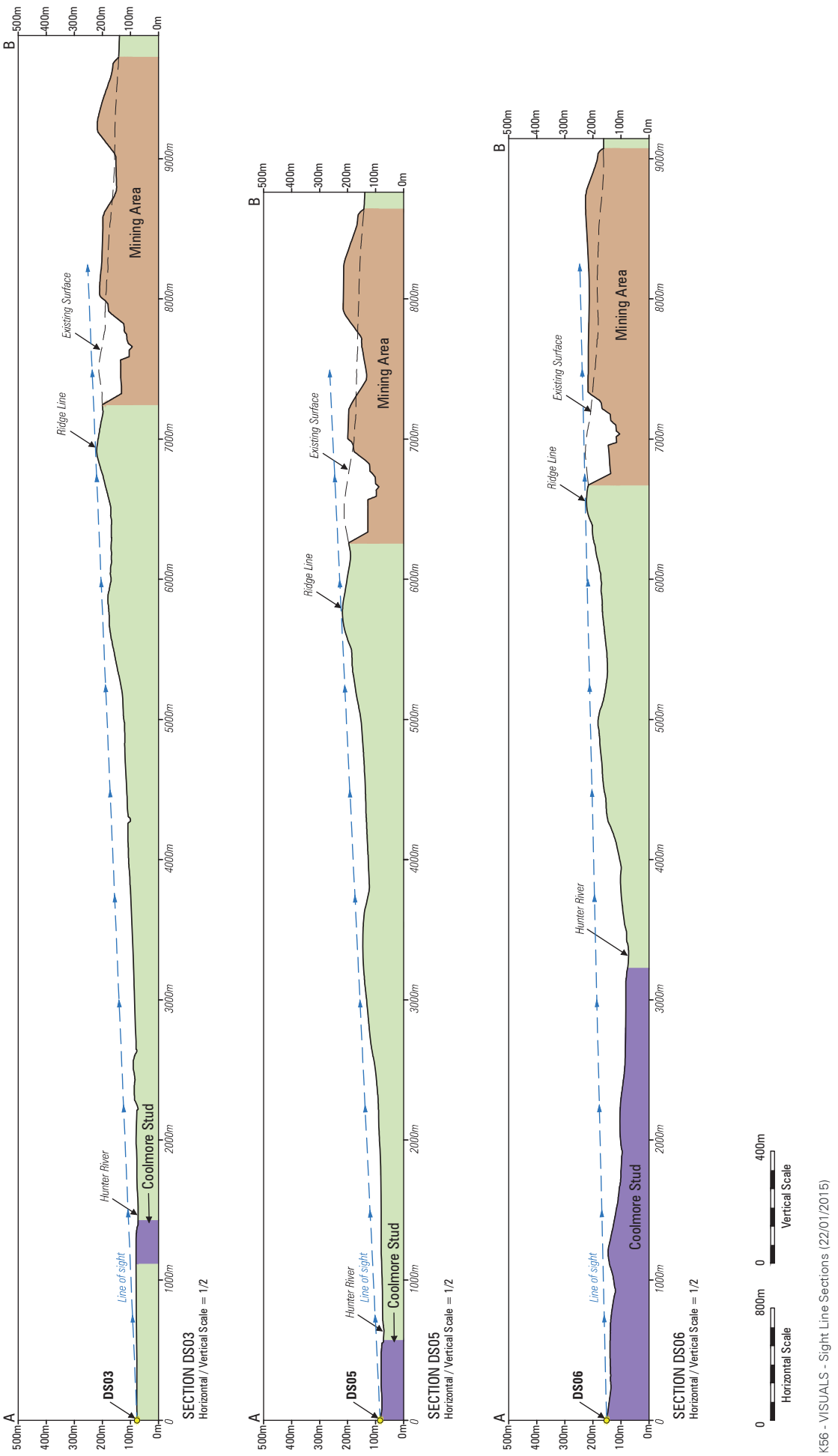


Figure 6.7 | *Line of sight section lines from sensitive view locations*

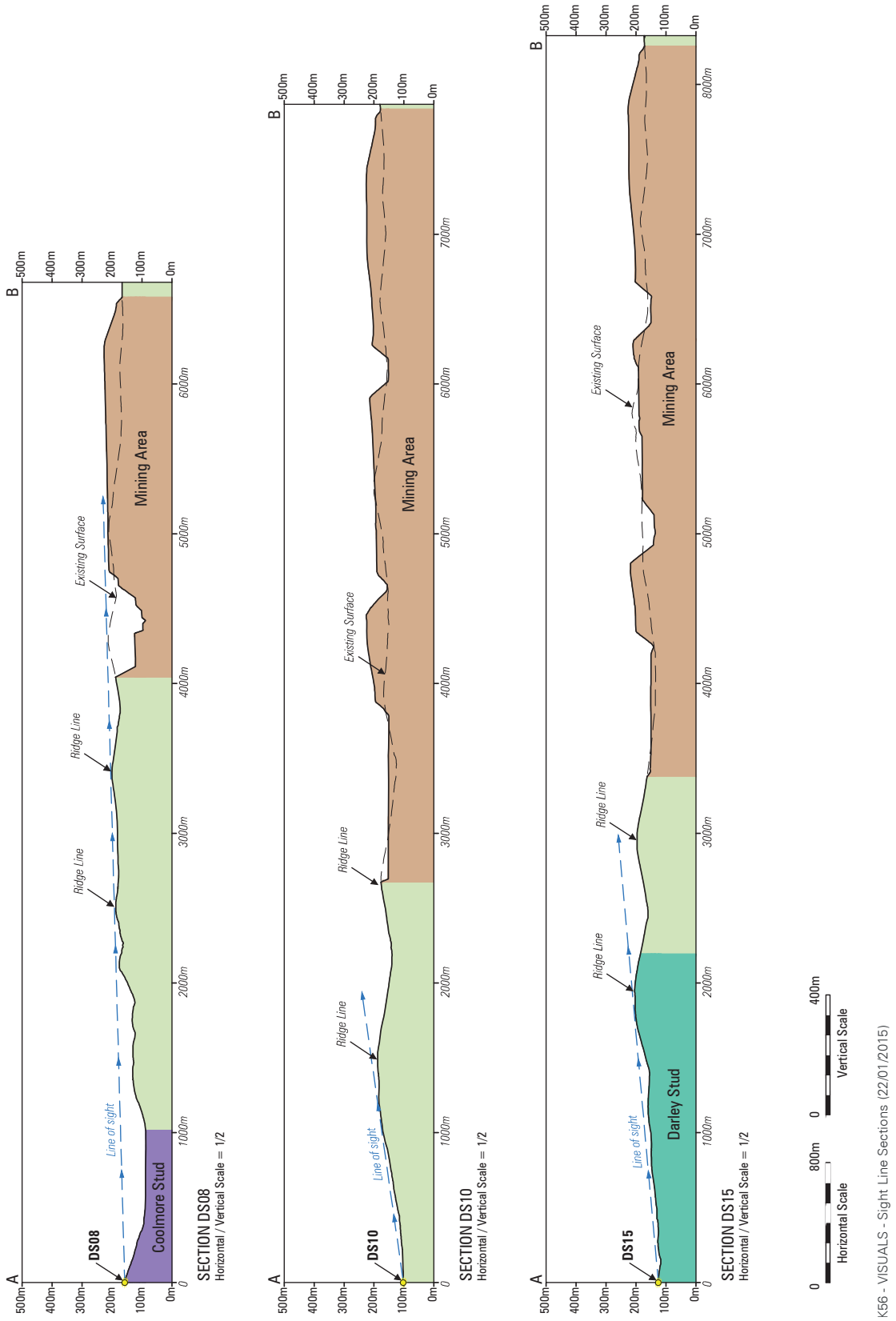


Figure 6.8 | *Line of sight section lines from sensitive view locations*

EDDERTON ROAD - EXISTING

MINING YEAR 4

MINING YEAR 6

MINING YEAR 12

Figure 6.9 | *Edderton Road realignment tree screen planting*

7 VISUAL IMPACT

The visual effects of the various elements of the Project were discussed in Section 6 of this report. The visual sensitivity levels of the Project were discussed in Section 5 of this report.

This section considers the visual impact of the Project based on visual effect and sensitivity values. As discussed in Section 5, the impact of the development will vary according to the visual effect of the Project, its visibility, and the visual sensitivity of areas from which it is seen. These two factors are considered together as indicated in Table 2.3 to determine impact levels. The visual impacts are considered in relation to the various sectors.

In addition to the visual landscape impacts, the PAC review report for the previous Drayton South application identified another type of impact to be considered in relation to the Project. Indirect impacts were discussed as part of the PAC Review Report and as identified in Section 2.5.

7.1 Northern Sector

Edderton Homestead, which is owned by HVEC (for Mt Arthur Coal Mine), is the only residence in this sector and it will have close views (<2.5 km) into the northern elements of the Project. As such it will likely experience high visual impacts during the early stages of the Project. This visual impact will be reduced to moderate and then low as the northern most extent of the OEAs are rehabilitated and mining advances further south.

Also within the northern sector are parts of Edderton Road which would have a moderate sensitivity (see Section 5.4). Due to the potential for some views towards the northern and north western faces of the OEAs from sections of Edderton Road (particularly where tree screens are not able to be planted) this will result in a high/moderate visual impact. This visual impact will be reduced to moderate and then moderate to low as the Blakefield and Whynot OEAs are rehabilitated and mining advances further south. The majority of views from Edderton Road will be screened by existing foreground vegetation and the tree screens planned to be planted as part of the Project.

Finally, Mt Arthur which is also within the northern sector will experience high visual effects, however the low sensitivity of the restricted view location reduces impacts to moderate and low.

The impact levels on the sector as a whole will quickly be reduced as the northern faces of the OEAs are rehabilitated. This will change visual effect levels from high to moderate and eventually to low as rehabilitation progresses. The visual impact levels will be similarly reduced.

7.2 Eastern Sector

There will be no significant visual impacts from the Project on areas in the eastern sector as views will be screened by the existing topography and the sector is dominated by electricity generating infrastructure and associated buffer lands. There are no sensitive receptors located in this sector.

7.3 Southern Sector

The southern sector contains most of the sensitive receptors for the Project, including the village of Jerrys Plains, Coolmore Stud, Hollydene Estate, the Golden Highway and some isolated rural residences. However, mine planning has contracted the mine to behind and

below a series of ridgelines that screen views of the Project from sensitive receptor locations. The Project mine plan has also been implemented in accordance with recommendations made by the PAC for the previous application to ensure there are minimal direct visual impacts on this sector. To achieve this, OEAs have been designed to ensure that they are effectively screened behind the ridgeline identified by the PAC that runs west from Plashett Knob (see Figure 5.1). Such planning has achieved screening for all sensitive locations including the visually sensitive Coolmore horse stud.

7.3.1 Jerrys Plains

There will be no direct visual impact on the village of Jerrys Plains as all views of the Project are screened.

7.3.2 Coolmore Stud

There will be no direct visual impact on Coolmore Stud as all views of the Project are screened.

Over time, there will be minor changes to existing views of ridgelines to the north of Golden Highway created by the growth of tree screens and conservation areas planted as part of the Project. These changes are consistent with some elements of existing landscape character units that is “Forested Hills VCU”. Over time, the tree screen plantings and conservation areas will improve the visual absorption capacity of the ridgelines, thereby improving their screening capacity.

From the high ridge that supports a maintenance road and passes cattle yards and the Coolmore quarry, there will be views to operational areas of the Project. It is noted that from this location there are currently views of the existing Mt Arthur Coal Mine, Hunter Valley Operations Mine and Bayswater Power Station.

Accordingly, following due consideration of the Gateway criteria as prescribed under the SRLUP (as outlined in Section 2.3), this Visual Impact Assessment concludes that the Project will not lead to significant impacts on the Equine CIC through a loss of scenic and landscape values in this sector.

7.3.3 Golden Highway

There will be no direct visual impact on the Golden Highway as all views of the Project are screened.

Over time, there will be minor changes to existing views of ridgelines when approaching from the east of Golden Highway created by growth of tree screen planted as part of the Project. These changes are consistent with some elements of existing landscape character units that is “Forested Hills VCU”. The tree screen planting over time will improve the visual absorption capacity of the ridgelines, thereby improving their screening capacity close to the ridgeline.

Views from the south-west are unlikely as Blakefield open cut and OEAs have been lowered behind existing north south ridgeline. In addition, the western mine profile has been cut away to ensure it remains out of lines of sight behind ridgelines from this elevated location.

Potential views from the Golden Highway when approaching from the west to distant mining areas in Blakefield and Whynot will also be further reduced by proactive tree screen planting already underway along these sensitive sections of the Highway. (See Figures 4.2 to 4.6 for position of existing and proposed tree screens).

7.3.4 Hollydene Estate

There will be no direct visual impact on the Hollydene Estate as all views of the Project are screened.

The facilities and residences associated with Hollydene have no views of the Project due to the screening effects of the southern ridgeline between Hollydene Estate and the Project. As such the facilities and residences associated with Hollydene Estate will have no visual impacts due to lack of visibility to the Project.

Accordingly, following due consideration of the gateway criteria as prescribed under the SRLUP (as outlined in Section 2.3), this Visual Impact Assessment concludes that the Project will not lead to significant impacts on the Viticulture CIC through a loss of scenic and landscape values.

7.3.5 Rural Residences

There are a limited number of rural residences within the southern sector to the east of Coolmore. There are no views of the Project due to the screening effects of the southern ridgeline between the residences and the Project.

7.4 Western Sector

7.4.1 Woodlands Stud

There will be no direct visual impact on Woodlands Stud as all views of the Project are screened.

Over time, there will be minor changes to existing views of ridgelines to the north of Golden Highway created by the growth of tree screen planted as part of the Project. These changes are consistent with some elements of existing landscape character units that is “Forested Hills VCU”. Over time, the tree screen plantings and conservation areas will improve the visual absorption capacity of the ridgelines, thereby improving their screening capacity close to the ridgeline.

The only exception is the location on Trig Hill. However, as described in Section 5.7, this location has been considered as a broad acre rural area and assigned a low sensitivity as it is not utilised as part of the day to day operations of the thoroughbred breeding aspects of Woodlands’ business. It also currently has views to the existing Mt Arthur and Drayton Coal Mines. As such it is assessed as having moderate to low visual impacts.

Accordingly, following due consideration of the gateway criteria as prescribed under the SRLUP (as outlined in Section 2.3), this Visual Impact Assessment concludes that the Project will not lead to significant impacts on the Equine CIC through a loss of scenic amenity and landscape values in this sector.

7.4.2 Rural Residences

Two western residences, ‘Mayland’ and the more elevated ‘Luloma’ would have potential views of higher elevation areas of the Project OEAs. However these receptors are over 8 km away and only small portions of Project operations would be potentially seen over intervening ridges. The moderate sensitivity and low to moderate visual effects will create a moderate to low impact.

The residences of Ravenswood and New Haven are too low in elevation and are screened by intervening ridges. Similarly Glen Munro is screened by an adjoining ridge line associated with Ogilvies Hill and these residences will not experience visual impact.

7.4.3 Edderton Road

A small portion of this road (approximately 1 km) will have open views to the south east across open grasslands to the Blakefield OEA. This is because this portion of the road is not on Anglo American owned land and as a result, tree screens might not be able to be planted. The road has a moderate sensitivity up to 2.5 km. Visual effects will initially be high during the initial

development of OEA, so a high to moderate visual impact will be experienced along this portion of the road. These visual effects will last up to 4 years after which rehabilitation of the OEAs facing the road will have progressed to a stage where impacts will be reduced. The southern 4 km of this road will be shielded by tree screens which will be planted as part of the Project construction period (see Figure 6.9).

The greatest impacts on users of this road will affect predominantly those travelling in a southwest direction before reaching tree screening; catching views of the OEAs across the broad flat areas adjacent Saddlers Creek. Those travelling north east on this road will not likely have any such views given the orientation of the road when travelling in that direction.

Table 7.1 | Visual Impact Summary

Receptors	Issue	Initial Impact Level Assessment	Mitigation	Final Impact Level Assessment
Northern View Sector				
Homesteads	Close views (<2.5 km) into the northern elements of the Project	High	Progressive rehabilitation of northern faces of the Project OEAs.	Transition to moderate - low during progressive rehabilitation.
Edderton Road	Potential for some views towards the northern and north western faces of the OEAs visible from sections of Edderton Road.	High to moderate	Tree screen planting along sections of Edderton Road.	Transition to moderate and low following implementation and establishment phase of tree screens.
Mt Arthur Coal Mine	Proximity and overviewing of Project; high visual effects but low visual sensitivity due to mining land use.	Moderate to low	Restricted view location.	Moderate to low
Eastern View Sector				
Plashett Knob and Ridge lines	Grazing lands with no public access.	Low	Restricted access to views from this location.	Low
Plashett Dam	Local industrial water supply with no public access or recreational activity.	Low	No views to proposed mining areas.	Low
Local Roads	Local private roads within grazing lands. Minor rural or industrial site roads.	Low	Restricted view location.	
AGL Macquarie buffer lands	Lands with industrial purpose as main intent, also supporting grazing.	Low	Restricted access to views from this location.	Low

Receptors	Issue	Initial Impact Level Assessment	Mitigation	Final Impact Level Assessment
Southern View Sector				
Jerrys Plains Village	Proximity to high sensitivity viewing location.	Low	Project mine plan has been implemented in accordance with PAC recommendations; OEAs and proposed mining areas have been designed to ensure that they are effectively screened behind the ridgeline. Tree screens planted as part of the Project to improve amenity and the visual absorption capacity along intervening ridgelines.	Low
Coolmore Stud	Proximity of high sensitivity viewing location to Project activities. Minor changes to views.	Low		Low
Hollydene Estate	Proximity to high sensitivity viewing location.	Low		Low
Golden Highway	Proximity of high sensitivity viewing location to Project activities. Minor changes to views.	Low	Existing tree planting currently developing visual screening of views. from the south-west.	Low
Rural Residences	Minor changes to views.	Low	OEAs and proposed mining areas have been designed to ensure that they are effectively screened behind the ridgeline.	Low

Receptors	Issue	Initial Impact Level Assessment	Mitigation	Final Impact Level Assessment
Western View Sector				
Woodlands Stud	Proximity of high sensitivity viewing location to Project activities. Minor changes to views.	Low	Project mine plan has been implemented in accordance with PAC recommendations; OEAs and proposed mining areas have been designed to ensure that they are effectively screened behind the ridgeline. Tree screens planted as part of the Project to improve amenity and the visual absorption capacity along intervening ridgelines.	Low
Rural Residences	Distant views to Project OEAs.	Moderate to low impact.	OEAs and proposed mining areas have been designed to ensure that they are effectively screened behind the ridgeline. Additional visual mitigation measures to be considered at residence locations if required..	Low
Edderton Road	Potential for some views towards the northern and north western faces of the OEAs visible from sections of Edderton Road.	High to moderate	Tree screen planting along sections of Edderton Road. Rehabilitation of western face of OEA	Transition to moderate and low during rehabilitation of OEAs. Implementation and establishment phase of tree screen planting.

7.4.4 Consideration of Scenic and Landscape Values as part of Gateway Criteria for SRLUP

In view of the SRLUP, the scenic and landscape values of the locality were considered. It is recognised that scenic and landscape diversity are a recognised resource base for tourism and associated agricultural pursuits such as viticulture and thoroughbred horse breeding. It Is In this context that the Project is considered.

In terms of scenic and landscape quality, the various VCUs that make up the Project setting combine to create a common, but none the less intact landscape, with special scenic qualities in the southern and western view sectors generally associated with the Coolmore and Woodlands horse studs and the Hunter River Flood Plain. These areas generally correspond with the areas mapped as BSAL and Equine / Viticulture CIC under the SRLUP.

This intact rural landscape setting, which is one of the broader regional landscape types of the Hunter Valley, is adjoined by open cut coal mining operations at Mt Arthur Coal Mine, Hunter Valley Operations, Bengalla and the existing Drayton Mine, as well as others along the Golden Highway and New England Highway beyond the setting of the Project.

These existing mining areas are also within the visual setting of the Project and more significantly, they are within the visual setting of the operational areas of the Project. Significantly the two major landscape components, i.e. the mine areas and the CIC areas defined by the SRLUP are visually isolated from each other due to intervening topography, with the mining located to the north and the CIC areas to the south and west.

Even though the mix of VCUs that make up the Project site create some variety in the rural landscape they would be considered common in terms of landscape quality. The exception to this are the horse stud areas that have distinctive features and create high landscape values.

Given the open character of the Project site it, by itself, would have a low visual absorption. However, surrounding topography screens it from view from significant tourist and agricultural/ tourist locations. These locations include the Golden Highway, the village of Jerrys Plains, Coolmore Stud, Woodlands Stud and Hollydene Estate to the south.

The ridge adjacent to the southern boundary of the Project screens the sensitive areas of Coolmore, Woodlands and Hollydene from direct view. In a similar way, the Golden Highway and Jerrys Plains will also be screened.

The Project has been developed in response to recommendations of the PAC Review Report (2013) in addition to earlier consultation working groups with Coolmore Stud to minimise visual impacts from their property including Batty Hill, a prominent lookout over the property and other areas of the stud. The buffer zone between sensitive locations has been doubled from the previous Drayton South application.

Visual assessment of upper mine limits and location behind the PAC recommended ridgeline using line of sight analysis and photomontages from sensitive view locations indicate that screening has been achieved at all of these sensitive locations.

The Project does not significantly compromise the scenic and landscape settings of the tourist and agricultural businesses around the Project.

7.5 Indirect Impacts

Indirect visual impacts include those effects experienced by residential receivers and land uses within the VSA that are not related to direct views of Project elements, but where evidence of Project activities can be perceived. Indirect visual impacts with the potential to occur as a result of the Project could include:

- Visible dust emissions from mining activities and the operation of equipment that is otherwise shielded from direct views by screening topography and vegetation;
- Visible blast impacts, including the emission of elevated blast fume or dust from blast events above screening topography and vegetation;
- Lighting impacts from Project infrastructure and night-time mining activities;
- Mine-related vehicle movements, both within the Project Boundary and on public roads surrounding the site;
- Mining-related infrastructure and site signage (for example on road sides); and
- Project construction activities.

7.5.1 Dust Emissions

Visible dust emissions resulting in indirect visual impacts can occur as a result of activities including active mining, handling, coal processing or the movement of equipment within the Project mining areas and haul corridor.

Visible blast emissions resulting in indirect visual Impacts can occur as a result of a number of factors, including:

- Prevailing meteorological conditions leading up to, and at the time of a blast,
- Geological conditions;
- Blast design and implementation;
- Contamination of blast-holes; and
- Blast sleep time.

Anglo American has committed to a range of operational controls and air quality monitoring and management measures for the Project to minimise visible dust and prevent fume emissions and associated air quality impacts. These are discussed in the Air Quality and Greenhouse Gas Impact Assessment (PEL, 2015) and Acoustic Impact Assessment (Bridges Acoustics, 2015) prepared to support the Project EIS. Should the Project be approved, the existing Air Quality and Blast Management Plans for Drayton Mine will also be revised to include the management of operations for Drayton South.

7.5.2 Night Light

Project lighting has the potential to result in indirect impacts to surrounding receivers. These are discussed further in Section 7.7.

7.5.3 Mine Related Traffic

Additional mine-related traffic on public roads and visible industrial infrastructure outside of active mining areas can also create indirect visual impacts to surrounding receivers and land uses as it acts as a reminder that there is a mine nearby. The Project will continue to utilise the existing Drayton Mine access road located on Thomas Mitchell Drive, and views of heavy mining equipment and new infrastructure will be screened from external views by vegetated ridgelines as described in Section 4. No mine related heavy vehicles will access the Project site from Edderton Road or the Golden Highway. Traffic movements associated with site deliveries and mine employees travelling to and from the Drayton Complex on public roads will also remain consistent with current arrangements. Project traffic will therefore not result in additional indirect visual effects to those already experienced in the VSA.

7.5.4 Construction Activities

Construction activities for the Project that will be visible from within the VSA will be restricted to the works associated with the realignment of Edderton Road which will occur prior to Year 4. While there is the potential for impacts to occur, it is considered that these are not likely to represent indirect impacts associated with Project mining operations as they would resemble normal road construction and maintenance works, in terms of visual character and impact. Further, the realignment works would be temporary in nature and recreate the visual impact of the existing Edderton Road in the new location proposed.

7.5.5 Consequences and Develop Mitigation

The major visual impact mitigation strategy has been to remove mining activity from any area that has potential visibility from sensitive locations and effectively create a buffer zone between the Project and horse studs. The Project mine plan adopts the PAC recommended extent of mining and thus removes the direct visual effects and through the effect of a greater buffer minimises indirect effects by increasing distance to and screening from sensitive viewing locations.

The Project mine plan, coupled with proper and ongoing community consultation and the timely and thorough implementation of mitigation strategies and operational management, will minimise any potential for indirect impacts and provide for the co-existence of mining and adjoining land uses.

7.6 Lighting Impacts

7.6.1 Introduction

The visual effect of lighting surrounding the Project Boundary will vary as a result of visual sensitivity and receptor locations. In general, the locations of sensitive receptors are generally toward the south, with some residences in the west. Edderton Homestead, which is owned by HVEC, is the exception and is located in the northern sector.

The majority of night lighting associated with mining projects is typically associated with CHPP infrastructure, workshops and rail load out infrastructure. This infrastructure is located at the existing Drayton Mine and hence was not assessed for the Project. Within the Drayton South area there will be limited fixed lighting at the mine infrastructure area (which remains screened by intervening topography from external views and located 6 km to the north of the horse studs), with only mobile plant likely to produce lighting impacts in active mining areas.

The effect of night light will be influenced by the locality of operations on-site, the relative level at which the viewing location is situated and the presence of any off-site barriers such as topographic features and / or vegetation. The screening of light, especially for receptors to the south, will be afforded by the screening ridgelines and vegetation that will be planted on it.

There are two types of lighting effects that could be experienced from the Project. The first effect is where the light source is directly visible (direct light), and will be experienced if there is a direct line of sight between a viewing location and the light source.

The second effect relates to the general night-glow (diffuse light) that results from light of sufficient strength being reflected into the atmosphere. This type of effect will create a strong local focal point and the effect will vary with distance and atmospheric conditions such as fog, low cloud and / or dust particles which all reflect light.

Both of these light effects already exist in the locality and are discussed further below in relation to the Project.

7.6.2 Direct Light Effects

The potential for direct light effects are generally restricted to vehicles and equipment moving outside of the active mining areas and roadway lighting (as other operational lighting would be hooded).

Generally, Project vehicle and equipment lighting will be screened by topography, vegetation and eventually by the OEAs and the mining areas themselves. During the first four years of the Project as the northern and western OEA at Blakefield and Whynot are constructed, night lighting from haul trucks and other machinery working on the outer faces of the OEA could project lighting effects outside the Project Boundary to the north and west. However with the exception of Edderton Homestead, which is owned by HVEC, there are no sensitive receptors in these locations. Areas to the south will be screened by existing topography and will not be subject to direct lighting effects.

7.6.3 Diffuse Light Effects

Mt Arthur Coal Mine, Hunter Valley Operations and the existing Drayton Mine already contribute diffuse light effects into the night sky in the broader locality. The influence of surrounding mining operations and associated lighting activities will reduce the visual impact of diffuse light associated with the Project. The diffuse night lighting effect of the Project would be far less than that which is currently emitted by the existing operations in the area given that the CHPP, workshops and other core infrastructure areas will continue to be located at the existing Drayton Mine. However it will be nearer to sensitive locations of Coolmore Stud in the southern sector and Woodlands Stud in the western view sector.

Generally, this glow would not create a significant visual effect but might be more apparent from time to time.

7.6.4 Night Light Impacts

The Project would result in night lighting impacts due to direct and diffuse light effects.

Direct lighting would create a higher impact but is more limited in extent to areas of the northern and western sectors where there are no defined sensitive receptors.

The diffuse lighting effects would have a lower impact although they would be more widely experienced, especially if moisture or particulate matter such as dust is present in the atmosphere. This would create a halo of light above active mining operations that are the sources of the light. This light glow would be seen from many locations around the Project Boundary. Although evident, it is not considered to be a significant visual impact, due to a combination of viewing distances, orientation of residences and screening effects of topography and vegetation.

The major mitigation elements against night light effects are topography, vegetation and distance to sensitive receptors. All potential light effects of the Project are mitigated to a level that will not create a significant visual impact.

8 MITIGATION

There are numerous mitigation measures incorporated in the design and operating plans for the Project that will reduce the visual effect and mitigate the visual impact of the Project on sensitive viewing locations. These include:

- Mine planning and design to ensure that the PAC Review Report recommended ridgeline was maintained and that all OEAs are developed and shaped so that they remain shielded behind this ridgeline from receptors in the southern and western sectors;
- Tree screens have been planned along the Golden Highway, along the ridgelines and the Edderton Road realignment to minimise views of the Project from various vantage points. These tree screens will be planted as part of the construction phase to allow for substantial growth;
- Detailed planting plans are to be prepared to clearly illustrate areas and character of planting on all rehabilitation areas including the OEAs and tree screens;
- Progressive rehabilitation of OEAs and disturbed areas;
- Use of compatible tones for building and cladding colours. Such colours will include tonal variations of existing colours in the surrounding landscape;
- Use of low lux lamps and direction of fixed lights toward the ground, where practical; and
- Implementation of work procedures related to the use of mobile lighting plants to avoid potential for adverse off site lighting impacts.

The mitigation measures listed above will reduce the visual effect of Project components by reducing visibility for sensitive receptors and reducing the level of contrast with the surrounding landscape.

Anglo American will also conduct ongoing consultation with stakeholders surrounding the site over the life of the Project. Should any issues arise in relation to visual impacts on surrounding sensitive viewing locations, these would be addressed through consultation with the relevant parties. If deemed necessary, additional measures may also be established to achieve greater mitigation at specific sensitive viewing locations. Such measures would include offsite visual treatments, such as establishing tree screens and / or plantings at the viewer's location to reduce visibility.

At completion of mining operations, the Project will be fully rehabilitated and decommissioned. The final rehabilitation and decommissioning of the site will involve further revegetation of disturbed areas on the mine site with native woodland communities.

9 REFERENCES

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