

07 | Landscape Character



Section 07 Landscape Character

7.1 Introduction

7.1.1 Purpose

The purpose of this section is to undertake a visual impact assessment (VIA) of the proposed Alpha Coal Project (Rail) (herein referred to as the Project). Landscape features are determined and/or influenced by physical, biological and cultural factors and may include vegetation and buildings. As such, visual landscape effects occur from changes in the physical landscape, which may give rise to changes in its visual character and how this is experienced. This may in turn affect the perceived value of the visual landscape.

This landscape and visual impact assessment (LVIA) describes the existing landscape and visual character within the visual catchment of the Project, identifies and assesses the existing visual context, undertakes an assessment of the significance of the impacts on the visual landscape, and identifies the extent to which mitigation of impacts is required.

This VIA was undertaken on the basis of a desktop assessment only, with nearest sensitive receptors being identified on the basis of aerial images (Google Images, 2010) and the visual impact on the basis of topographical maps and site visits. A thorough VIA has been undertaken for the Alpha Coal (Mine) and Alpha Coal (Port) components of this EIS, which are likely to identify more extensive visual impacts than the construction of the railway line.

7.1.2 Assessment Methodology

The methodology for this study, including impacts and proposed mitigation measures, has been derived from the *Guidelines for Landscape and Visual Impact Assessment, Second Edition*, published by the Landscape Institute and Institute of Environmental Management and Assessment (2002), and the *Visual Landscape Planning in Western Australia* document produced by the Western Australian Planning Commission (2007).

7.1.3 Existing Environmental Values

The methodology for the identification of the existing environmental values of the area surrounding the site and the identification of the viewpoints is detailed below:

- identification of potentially affected receptors and viewing locations which are accessible to the public or are a place of residence using aerial photography (Google Images, 2010);
- site verification of publicly accessible and representative viewpoints with photographic recording to provide a representation of typical views possible from that locality to the Project; and
- review of existing information and collation of relevant background information including planning and land use.

7.1.4 Assessment of Impacts

A qualitative assessment of landscape and visual impacts forms the second component of the assessment. The significance of impacts has been evaluated using a combination of landscape impacts and visual impacts, as defined below.

7.1.4.1 Landscape Impact

Landscape impacts refer to the relative capacity of the landscape to accommodate changes to the physical landscape of the type and scale proposed that would occur as a direct result of the Project. Impacts have been assessed from identified viewing locations and consider (through professional judgement) the scale of change including:

- the extent to which the change of features alters the existing landscape character;
- the extent of area from which the effect is evident;
- the duration of the effect (short, medium, long term, or permanent);
- the physical state (or condition) of the landscape and its intactness from visual, functional, and ecological perspective. This includes consideration of the condition of landscape elements such as roadside planting or landscaping or features such as a distinctive building, or significant mature trees, and their contribution to landscape character; and
- the effectiveness of any proposed mitigation.

Definitions used to describe this assessment are detailed in Table 7-1.

Table 7-1: Assessment of Landscape Impact

Landscape Impact	Definition
Large	<p>A substantial / obvious change to the landscape due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.</p> <p>Change is likely to cause a direct adverse permanent or long term (more than ten years) impact on the value of the receptor.</p>
Moderate	<p>Discernible changes in the landscape due to partial loss of, or change to the elements, features or characteristics of the landscape. May be partly mitigated. The change would be out of scale with the landscape, and at odds with the local pattern and landform and will leave an adverse impact on the landscape.</p> <p>Change is likely to impact adversely the integrity/value of the receptor but recovery is predicted in the medium term (five to ten years).</p>
Small	<p>Minor loss or alteration to one or more key landscape elements, features, or characteristics, or the introduction of elements that may be visible but may not be uncharacteristic within the existing landscape.</p> <p>Change is likely to adversely impact the integrity/value of the receptor but recovery is expected in the short term (up to four years).</p>
Negligible	<p>Almost imperceptible or no change in the view as there is little or no loss of / or change to the elements, features or characteristics of the landscape.</p> <p>The existing landscape quality is maintained but may be slightly at odds to the scale, landform and pattern of the landscape.</p>

Source: Landscape Institute and Institute for Environmental Management and Assessment, 2002.

7.1.4.2 Visual Impact

Visual impacts arise from changes in available views of the landscape that occur as a result of the Project. Visual impact is determined through the subjective assessment of sensitivity of the visual receptors and the magnitude (scale) of the change in view. Sensitivity is dependent upon receptors'

location, the importance of their view, their activity, expectations, available view, and the extent of screening of this view.

Factors that have been considered in assessing the response to changes in the visual amenity include:

- interest in the visual environment and their distance/angle of view to the source of the impact;
- the extent of screening/filtering of the view;
- magnitude of change in the view (i.e. loss/addition of features that change the view's composition);
- integration of changes within the existing view (form, mass, height, colour and texture);
- duration of the effect (temporary/permanent, intermittent/continuous); and
- effectiveness of the proposed mitigation.

Receptor sensitivity definitions used to describe this assessment have been outlined in Table 7-2.

Table 7-2: Assessment of Receptor Sensitivity

Sensitivity	Definition
High	<ul style="list-style-type: none"> • occupiers of residential properties with long viewing periods, within close proximity to the proposed development; and • communities that place value upon the landscape and enjoyment of views of their landscape setting.
Medium	<ul style="list-style-type: none"> • outdoor workers who have a key focus on their work who may also have intermittent views of the Project area; • viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited; and • occupiers of residential properties with long viewing periods, at a distance from or screened from the Project area.
Low	<ul style="list-style-type: none"> • road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views; and • viewers indoor at their place of work, schools or similar.
Negligible	<ul style="list-style-type: none"> • viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short; and • road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times.

Source: Landscape Institute and Institute for Environmental Management and Assessment, 2002

7.1.4.3 Significance of Impact

For the purposes of this assessment, predicted impacts as a direct result of the Project have been described according to their significance, which is a function of the magnitude of the impact and the sensitivity of the receptor as detailed in Table 7-3. Only impacts that are considered to be of major or high significance are considered as significant for the purposes of this assessment.

Table 7-3: Significance of Impact

		Landscape Impact			
		Large	Moderate	Small	Negligible
Visual Sensitivity	High	Major Significance	High Significance	Moderate Significance	Minor Significance
	Medium	High Significance	Moderate Significance	Minor Significance	Not Significant
	Low	Moderate Significance	Minor Significance	Not Significant	Not Significant
	Negligible	Minor Significance	Not Significant	Not Significant	Not Significant

Source: Landscape Institute and Institute for Environmental Management and Assessment, 2002

7.1.5 Limitations of the VIA

Landscape and visual assessment requires qualitative (subjective) judgments to be made. The conclusions of this assessment therefore combine objective measurement and subjective professional interpretation. As detailed in *Visual Landscape Planning in Western Australia* (2007) it is recognised that:

- some viewing locations, views, and areas visible in views will be considered more important than others by those experiencing the landscape; and
- some viewers will be more aware of the landscape and more concerned about its appearance, depending on their reasons for being in the landscape.

7.2 Description of Environmental Values

7.2.1 Overview

The following section provides an overview of the existing landform; land uses and vegetation in the vicinity of the Project site (refer to Figure 6-1). These features all contribute to the landscape and visual character of the area.

7.2.2 Land Use and Landform

The Project traverses a rural landscape, dominated by agricultural and horticultural land uses. Extractive industries are also present in vicinity to the corridor and include:

- Sonoma coal mine;
- Collinsville thermal coal mine;
- Newlands thermal coal mine; and
- several other mines located in the surrounds of Moranbah, Clermont and Coppabella within the Bowen Basin.

Small mining townships are located in surrounds of the Project, consisting of residential, commercial and rural land uses. Key townships include Alpha, Clermont, Collinsville, Glenden, Merinda, Bowen and others.

The northern section of the Project area, beginning from approximately chainage 495 km to the railway loop end within the Abbot Point State Development Area (APSDA). Land is predominantly used for rural use and special use at the Port of Abbot Point area.

Key natural features within the corridor include:

- Cudmore National Park;
- Narrien Range and National Park;
- Mt Donnybrook;
- Epping Forest National Park;
- Mazeppa National Park;
- Denham Range to the north east of the Project;
- Cardborough Range to the north east of the Project;
- Leichardt Range to the north west of the Project;
- Clark Range to the north east of the Project; and
- Mt Abbot and Mt Luce located at Abbot Point end and north-west of the northern load out loop.

7.2.3 Topography and Vegetation

The topography of the study area and presence of vegetation is one of the determining factors in identification of visual impact on the nearest sensitive receptors. Considering the 495 km length of the Project, the topographical features and vegetation of the corridor largely vary from the southern end to the northern end of the corridor. Similarly, the topography of the corridor varies, from being generally an area of plain and gently undulating slopes with alluvial flats around the Alpha Coal mine to steep slopes rising up to 60% between chainages 21.1 km to 23 km (for further description of topography and vegetation refer to Volume 3, Section 9.2.1 of this EIS). The corridor passes various mountain ranges particularly: Leichardt Range to the north-west of the corridor (west of Collinsville) and Cardborough Range north east of the corridor (south-west of Glenden).

Throughout the whole length of the corridor, the alignment traverses the Brigalow Belt and Desert Uplands bioregions. As such the vegetation is predominantly consistent of brigalow and ironbark for this section of the Project. The existing vegetation is likely to serve as a visual buffer minimising potential visual impacts from the nearest sensitive receptors.

For an overview of the topographical features of the corridor refer to Figure 5-4 in Volume 3, Section 5 of this EIS and for type and location of existing vegetation refer to Volume 3, Section 9, Figure 9-2 of this EIS.

7.2.4 Land Use

The study area is dominated by rural land use, primarily agricultural and horticultural industries. Much of the study area is extensively grazed by cattle. Modification to the natural landscape attributable to grazing are evident in the form of vegetation clearing, introduction of exotic pasture grasses and consequent displacement of native grasses and herbs, reduced ground cover, soil erosion, soil compaction and erosion of creek banks. Additional land uses within the catchment include sugar and

horticulture cropping, aquaculture and mining. Water and gas infrastructure is also evident throughout the study area.

7.2.5 Viewing Locations and Nearest Sensitive Receptors

The visual catchment provides the basis upon which viewing locations and sensitive visual receptors can be identified and further assessment undertaken. The viewing locations are areas where full or screened views of the site are possible and there is human activity being undertaken. This activity may include residential, business, schooling or recreation. In addition, viewing locations also include areas where the only views are transient such as vehicles using a road or views from trains.

On the basis of aerial photography, a total of 36 dwellings have been identified (refer to Figure 2-1 in Volume 3, Section 2 of this EIS). Out of 36 dwellings two are located within a 500 m distance of the Project, one within 1 km and 33 further than 1 km of the proposed railway line. The impact of the Project on the visual sensitivity from the nearest two dwellings has been analysed and presented in Figure 7-1 and Table 7-4.

Dwellings outside of the 500 m buffer are unlikely to experience significant visual impacts. Dwellings that are 1 km away from the Project may view proposed temporary workers camps, particularly dwelling located near 272.5 km (refer to Figure 2-1 in Volume 3, Section 2, Sheet 8 of 14 of this EIS). However, as the subject dwelling is a property manager's house and is not permanently occupied, it is reasonable to assume that the visual impact will be minor.

The Project is likely to be viewed by road users of the following roads:

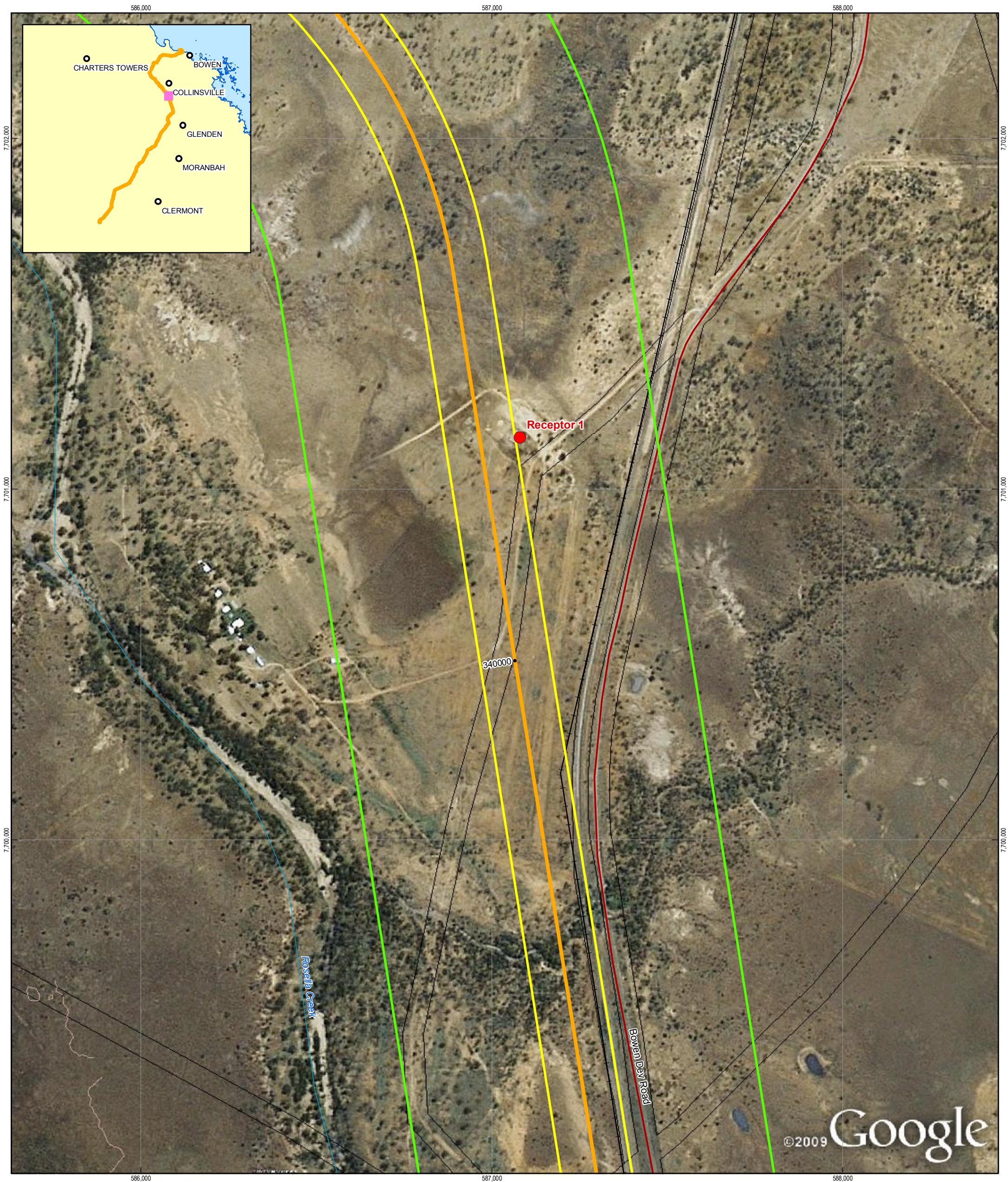
- Degulla Road;
- Surbiton Wendouree Road;
- Eulimbie Road;
- Albro Pioneer Road;
- Clermont Laglan Road;
- Frankfield Road South;
- Frankfield Road North;
- Gregory Development Road;
- Golden Downs Road;
- Dooruna Road;
- Diamond Downs Eagle Field Road;
- Mabbings Road;
- Chesterfield Road;
- Suttor Developmental Road;
- Wollombi Road;
- Cerito Road;
- Collinsville Elphinstone Road;

- Bowen Developmental Road;
- Myuna Road North;
- Strathmore Road;
- Johnny Cake Road;
- Strathalbyn Road;
- Nevada Road;
- Glenore Road; and
- Bruce Highway.













Tourists or recreational users may also view the Project while visiting the surrounding National Parks and mountain ranges such as:

- Cudmore National Park;
- Narrien Range and National Park;
- Epping Forest National Park;
- Mazeppa National Park;
- Denham Range to the north east of the Project;
- Cardborough Range to the north east of the Project;
- Leichardt Range to the north west of the Project; and
- Clark Range to the north east of the Project.

While the construction and operation of the Project may be visible from these locations, it is unlikely to cause a significant negative impact due to the presence of vegetation and topographical features.

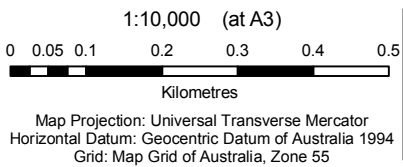


LEGEND

- | | | | |
|--|--|---|--|
|  Sensitive Receptor |  Proposed Alignment |  Contour (5m) |  Cadastre |
|  State Road |  Major Contour |  Easement |  1000m Corridor |
|  Existing Railway |  Minor Contour |  200m Corridor | |
|  Watercourse | | | |

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Alpha Coal Project
Environmental Impact Statement

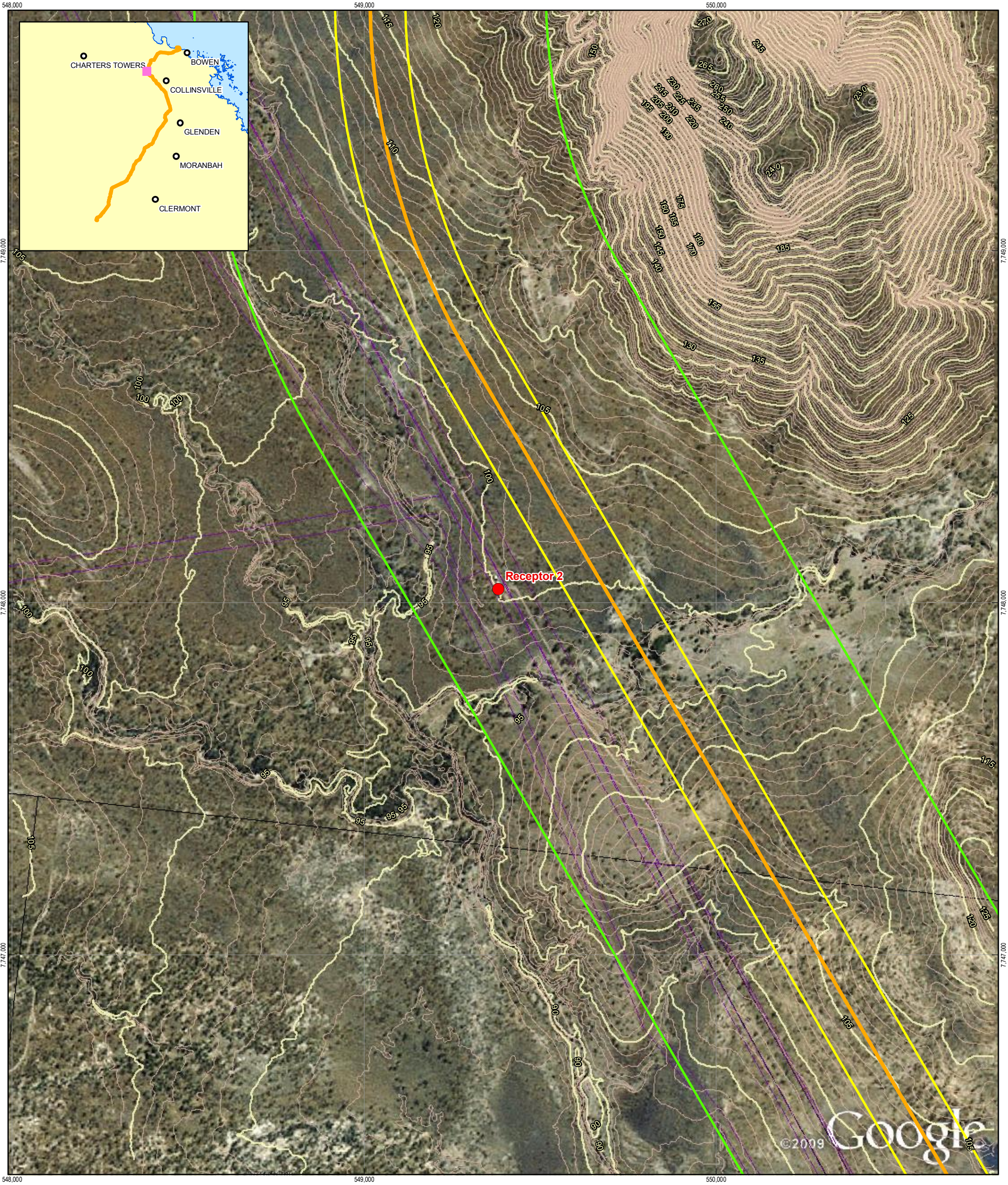
SENSITIVE RECEPTORS

Job Number 41-22090
Revision A
Date 21-09-2010

Figure: 7-1
Sheet 1 of 2

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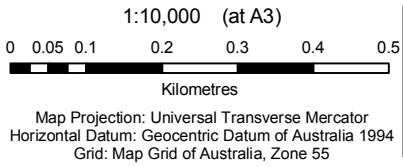
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- LEGEND**
- Sensitive Receptor
 - Proposed Alignment
 - State Road
 - Existing Railway
 - Watercourse
 - Contour (5m)
 - Major Contour
 - Minor Contour
 - Cadastre
 - Easement
 - 1000m Corridor
 - 200m Corridor

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Alpha Coal Project
Environmental Impact Statement

SENSITIVE RECEPTORS

Job Number | 41-22090
Revision | A
Date | 21-09-2010

Figure: 7-1
Sheet 2 of 2

7.2.6 Viewing Locations

Sensitive receptors identified within a 500 m buffer of the Project are identified in Table 7-4. The description of the existing environment, particularly the topography and vegetation factors have been noted.

It should be noted that these receptors have been identified on the basis of a desktop assessment only. As such, it has been assumed that all dwellings are residential dwellings occupied by permanent residents. Some objects may be sheds that are only used on a part time basis rather than occupied full time.

Table 7-4: Existing visual context of nearest sensitive receptors

Visual context	Description
Receptor 1 (R1) - Lot 62 on SP195387, chainage 338.5 km	
Typical local visual character	The dwelling is located 113 m from the Project. Bowen Developmental Road runs in near vicinity to the dwelling. The existing visual context consists of a predominantly rural landscape with sparse bushland and Rosella Creek located to the north west of the dwelling. An existing railway line is located to the north east of the dwelling.
Topography (Refer to Volume 3, Section 5, Figure 5-1)	Relatively low land, with the dwelling being located on a higher ground level than the Project. General topography of the surrounding area is generally flat, particularly towards the Rosella Creek.
Vegetation	Predominantly grassy open woodland.
Land Use	Rural grazing - Cattle breeding and fattening
Visual Context	Views from this viewpoint are experienced by: <ul style="list-style-type: none"> residents occupying the dwelling, property manager visiting the site and other occasional visitors to the property.
Receptor 2 (R2) - Lot 7 on SB730, chainage 404 km	
Typical local visual character	This dwelling is located 260 m from the Project. The subject dwelling is located on a higher ground than the Project The general character of the area is rural.
Topography (Refer to Figure 5-1 in Volume 3, Section 5 of this EIS)	The general area surrounding the dwelling is hilly. A hill is present to the north east of the dwelling, with slopes ranging from 165 m to 130 m. The subject dwelling is located on higher ground than the Project.
Vegetation	Shrubby eucalypt woodland is located north east of the dwelling. The vegetation in immediate vicinity to the dwelling is quite sparse with some pockets of short shrubs.
Land Use	Rural - Cattle breeding and fattening.
Visual Context	Views from this viewpoint are experienced by: <ul style="list-style-type: none"> residents occupying the dwelling, property manager visiting the site and other occasional visitors to the property.

7.3 Potential Impacts and Mitigation Measures

7.3.1 Potential Impacts

The potential visual impacts are considered in the context of the sensitivity of the surrounding visual environment and the potential for viewing of the areas that have had changes to their visual outlook due to site works. The assessment of potential visual impacts of the Project focuses on the visibility of both the construction and operation phases of the Project.

The landscape and visual impacts of the Project on the viewpoints have been assessed for both the construction and operational phases of the Project. These impacts are addressed in Table 7-5.

Table 7-5: Potential visual impacts

Key visual factors	Description of potential impacts during construction and operation stages
Receptor 1 (R1) - Dwelling located on Lot 62 on SP195387, chainage 214.2 km (113 m away from the Project)	
Visible Project Elements	<p>The following elements of the Project may be visible from this location during the construction stage:</p> <ul style="list-style-type: none"> clearing of vegetation prior to construction of the Project; earthworks, cut and fill operations; and transport of materials by large trucks to the corridor. <p>The following elements of the Project may be visible from this location during the operation stage:</p> <ul style="list-style-type: none"> constructed railway line; fence surrounding the corridor; and coal trains passing the location for 3-4 minutes 14¹ times per 24 hours.
Landscape and visual impact	<p>The impact on the landscape is likely to be moderately high as the corridor within this location is located in a dip. Clearing of vegetation for the 60m wide corridor will change the existing landscape which is currently dominated by bush and medium height trees.</p> <p>The visual impact from the proposed dwelling is likely to be moderate. This is primarily due to the fact that the house is located on a hill. Trains will be mostly visible from the north-west view of the dwelling.</p> <p>It is assessed that the Project will have a moderate adverse landscape impact from this viewpoint. Regrowth of vegetation surrounding the corridor may mitigate this impact.</p>
Significance of Impact	High Significance
Receptor 2 (R2) - Dwelling located on Lot 7 SB730 (260m away from railway line)	
Visible Project Elements	<p>The following elements of the Project may be visible from this location during the construction stage:</p> <ul style="list-style-type: none"> clearing of vegetation prior to construction of the Project; earthworks, cut and fill operations; and transport of materials by large trucks to the corridor.

¹ It should be noted that the coal trains will pass 14 times per 24 hours as such the residents of the particular dwelling will only see the trains passing during the day. This frequency applies for 60Mtpa which includes Alpha Coal and Kevin's Corner coal output.

Key visual factors	Description of potential impacts during construction and operation stages
	<p>The following elements of the Project may be visible from this location during operation stage:</p> <ul style="list-style-type: none"> constructed railway line; fence surrounding the corridor; and coal trains passing the location for 3-4 minutes 14² times per 24 hours.
Landscape and visual impact	<p>The impact on the landscape is likely to be moderately high as the corridor within this location is located in a dip. Clearing of vegetation for the 60m wide corridor will change the existing landscape which is currently dominated by bush and medium height trees.</p> <p>The visual impact from the proposed dwelling is likely to be moderate. This is primarily due to the fact that the house is located on a hill. Trains will be mostly visible from the north-west view of the dwelling.</p> <p>It is assessed that the Project will have a moderate adverse landscape impact from this viewpoint. Regrowth of vegetation surrounding the corridor may mitigate this impact.</p>
Significance of Impact	Moderate significance

7.3.2 Mitigation Measures

The aim of this section is to identify mitigation measures that will reduce and/or manage adverse impacts of both the construction and operation stages of the Project on the landscape character and visual amenity.

7.3.2.1 Construction Phase

The Project aims to achieve construction without causing undue visual disruption to receptors. The following mitigation measures are proposed for this Project where possible:

- avoid loss or damage to vegetation within the rail corridor and adjacent road reserves including the protection of trees prior to construction and/or trimming of vegetation to avoid total removal. This includes vegetation that makes a significant and positive contribution to landscape character and/or provides screening to adjacent receptors;
- minimise light spillage through designing the construction lighting to ensure the site is not over-lit and to minimise additional light spillage from the rail corridor into adjacent visually sensitive properties. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution;
- temporary hoardings, barriers, traffic management and signage to be removed when no longer required;
- materials and machinery to be stored tidily during the works; and
- roads providing access to the rail corridor and work sites to be maintained free of dust and mud as far as reasonably practicable.

² It should be noted that the coal trains will pass 14 times per 24 hours, as such the residents of the particular dwelling will only see the trains passing during the day.

7.3.2.2 Operation Phase

The following mitigation measures are proposed:

- minimise light spillage through designing the operation lighting to ensure the site is not over-lit and to minimise additional light spillage from the rail corridor into adjacent visually sensitive properties. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution;
- undertake rehabilitation planting where possible to replace vegetation that provided screening to adjacent sensitive visual receptors; and
- provision of screen fencing adjacent to residential properties where screening vegetation or fencing has been removed as part of the Project works.

7.4 Conclusions

The landscape and visual impacts of the Project are likely to be of moderate significance to the two receptors. Due to the nature of the Project it is likely that there will be a permanent impact on the visual landscape and amenity of the area. However, considering that the trains will be passing only 14 times a day and the nearest sensitive receptors may not be fully occupied residences, it is reasonable to state that the frequency of the visual impact is likely to be low. With implementation of appropriate mitigation measures the significance of the visual impact is likely to be reduced.

The landscape and visual impacts of the Project will occur both during the construction and operation phases of the Project. A summary of the outcomes of this assessment are detailed in Table 7-6.

Table 7-6: Summary of Impacts

Viewing Location	Landscape Impact	Visual Sensitivity	Significance of Impact
Receptor 1	●	●	●
Receptor 2	●	●	●
<p>○ Negligible Landscape Impact / Negligible Visual Sensitivity / Not Significant Impact</p> <p>● Small landscape Impact / Low Visual Sensitivity / Minor Significance of Impact</p> <p>● Moderate Landscape Impact / Medium Visual Sensitivity / Moderate Significance of Impact</p> <p>● Large Landscape Impact / High Visual Sensitivity / High Significance of Impact</p> <p>* Major Significance of Impact</p>			