



Landscape Character and Visual Impact Assessment

Rix's Creek Continuation of Mining Project

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Report Number: I931
Version / Date: V11 / June 2015

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This Visual Impact Assessment has been prepared by RPS Australia East Pty Ltd on behalf of Rix's Creek Pty Ltd in response to the advised Director General's Requirements, and supports the current application for the continuation of the mining operations at Rix's Creek Mine.

Land forms and proposed works are derived from Cad files provided through the Rix Creek data room.

Feature	Source File	Received Date.
Existing Land form	06.01.01.03 22463A_Rixs_Creek_MGA56_Jan2014_Triangles.dxf	20-05-2014
Earth works at 2017	06.01.07.07 yr17_shape_Ver_2.dxf	19-06-2014
Earth works at 2020	06.01.07.07 yr17_shape_Ver_2.dxf	19-06-2014
Earth works at 2023	06.01.07.12 cm_2023.dxf	24-06-2014
Earth works at 2026	06.01.07.11 cm_2026_Ver_3.dxf	24-06-2014
Final Earth works at 2038	06.01.07.04 final_landform.dxf	20-05-2014

Document Status

Version	Purpose of Document	Orig	Review	Review Date
10	Final issue	KA	MS	06/02/2015
11	Minor Client amendments	HY	MS	12/06/2015

Approval for Issue

Name	Signature	Date
Myall Stevens		12/06/2015

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Glossary of Terms

Term	Definition
Active workings	Any place in a Mine where Miners are normally required to work or travel.
Aesthetics	Relating to the sense of the beautiful or science of aesthetics i.e. the deduction, from nature and taste, the rules and principles of beauty.
Aquifer	Geologic formation, group of formations, or part of a formation capable of transmitting and yielding quantities of water.
Archaeology	The scientific study of human history, particularly the relics and cultural remains of the distant past.
Arterial roads	The main or trunk roads of the State road network.
Bed	Stratum of coal or other sedimentary deposit.
Bin	Coal storage structure, either underground or surface structure.
Blast	A controlled explosion which is used to loosen the substance being Mined.
Bloomfield	Bloomfield Collieries Pty Ltd – Parent Company of the Bloomfield Mine and Rix's Creek Mine
Catchment	The area from which a surface watercourse or a groundwater system derives its water.
Clearing	The removal of vegetation or other obstacles at or above ground level.
Coal Handling and Preparation Plant	Treatment by screening coal into various sizes to meet a purchasers requirements and treatment by one or more processes to reduce the amount of waste (ash) present in the coal.
Compressive strain	Compressive strains decrease in the distance between two points and may cause shear cracking, steps, or concave curvatures at the ground surface.
Conveyor	A means of transporting coal. It consists of a belt being driven by a motor drum system over a structure roller assembly.
Cover	The overburden above the coal resource.
Critical habitat	A critical habitat as defined under the Threatened Species Conservation Act 1995 includes, the <i>'whole or any part or parts of the area or areas of land comprising the habitat of an endangered species, population or ecological community or critically endangered species or ecological community, that is critical to the survival of the species, population or ecological community'</i> .
Cumulative impacts	Combination of individual effects of the same kind due to multiple actions from various sources over time.
Cut	Mechanically slice a coal seam to extract the coal resource.
Desired future character	A term used to capture the desirable future outcome or vision for an area as set down in planning documents or as professionally assessed and envisaged by urban designers or other built environment professionals
Discharge	A release of water from a particular source.
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
Earthworks	Operations involved in loosening, excavating, placing, shaping and compacting soil or rock.
Ecology	The study of the relationship between living things and the environment.
Ecologically sustainable development	As defined by the Protection of the Environment Administration Act 1991, requires the effective integration of economic and environmental considerations in decision making processes including: The precautionary principle. Inter-generational equity.

Term	Definition
	Conservation of biological diversity and ecological integrity. Improved valuation, pricing and incentive mechanisms (includes polluter pays, full life cycle costs, cost effective pursuit of environmental goals).
Ecosystem	As defined in the Environment Protection and Biodiversity Conservation Act 1999, an ecosystem is a 'dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit.'
Edge effects	A change in species composition, physical conditions or other ecological factors at the boundary between two ecosystems or the ecological changes that occur at the boundaries of ecosystems (including changes in species composition, gradients of moisture, sunlight, soil and air temperature, wind speed and other factors).
Environmental Management Plan.	A site specific plan developed for a project to ensure that all contractors and sub-contractors comply with the environmental conditions of approval for the project and that environmental risks are properly managed.
Endangered Ecological Community	An ecological community identified by the Threatened Species Conservation Act 1995 that is facing a very high risk of extinction in New South Wales in the near future, as determined in accordance with criteria prescribed by the regulations, and is not eligible to be listed as a critically endangered ecological community.
Emission	The discharge of a substance into the environment.
Environmental Management Plan	A plan used to manage environmental impacts during each phase of project development. It is a synthesis of proposed mitigation, management and monitoring actions, set to a timeline with defined responsibilities and follow up actions.
Environmental management system (EMS)	A quality system that enables an organisation to identify, monitor and control its environmental aspects. An EMS is part of an overall management system, which includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.
Environment	As defined within the Environmental Protection & Assessment Act, 1979, all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings.
Ephemeral	Existing for a short duration of time.
Environmental Protection Licence (EPL)	Environment Protection Licence. EPLs are issued by EPA under the Protection of the Environment Operations Act 1997. EPLs with respect to scheduled development work or scheduled activities or non-scheduled activities may regulate all forms of pollution (including water pollution) resulting from that work or those activities. EPLs authorising or controlling an activity carried on at any premises may also regulate pollution resulting from any other activity carried on at the premises to which the licence applies.
Extraction height	The heights at which the seam is extracted.
Fault	Break in the continuity of a coal seam or rock strata.
Green waste	Organic waste resulting from the trimming, pruning, lopping, cutting or felling of any form of vegetation (e.g. grass, trees or shrubs).
Groundwater	Water located within an aquifer that is held in the rocks and soil beneath the earth's surface.
Habitat	The place where a species, population or ecological community lives (whether permanently, periodically or occasionally).
Hydrocarbon	Any organic compound — gaseous, liquid or solid — consisting only of carbon and hydrogen.
Hydrogeology	The study of subsurface water in its geological context.
Hydrology	The study of rainfall and surface water runoff processes.
Impact	Influence or effect exerted by a project or other activity on the natural, built and

Term	Definition
	community environment.
Key threatening process	As defined under the Threatened Species Conservation Act 1994, a key threatening process is any listed process under the Act that adversely affects threatened species, populations or ecological communities, or that could cause species, populations or ecological communities that are not threatened to become threatened.
Landscape	All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure.
Landscape architecture	A profession involved with the assessment, design and management of the built and natural environment.
Landscape character	The aggregate of built, natural and cultural aspects that make up an area and provide a sense of place. Includes all aspects of a tract of land – built, planted and natural topographical and ecological features.
Landscape Character Zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent
Local road	A council controlled road which provides for local circulation and access.
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.
Overburden	The geological units and material above the coal seam proposed or being Mined.
Pollutant	Any matter that is not naturally present in the environment.
Preparation plant	A place where coal is sized, treated by one or more processes, including washing, to reduce the amount of waste (ash) present and prepared for market.
Proposed development	Extension of open cut coal mining and associated activities at Rix's Creek Mine within the Project Area. Referred to as The Rix's Creek Continuation of Mining Project (The Project).
Rehabilitation	The return of disturbed land to a stable, productive and self-sustaining condition, after taking into account beneficial uses of the site and surrounding land.
Revegetation	Direct seeding or planting (generally with native species) within an area in order to re-establish vegetation that was previously removed from that area.
Riparian	Relating to the banks of a natural waterway.
Rix's Creek	The creek running through the Rix's Creek Mine.
Run-off	The portion of water that drains away as surface flow.
Run of Mine	Raw coal production that contains coal and rock.
Seam	Layer or bed of coal.
Sensitive receiver	A location where a person works or resides, including residential, hospitals, hotels, shopping centres, play grounds, recreational centres or similar.
Sensitivity	The sensitivity of a landscape Character Zone or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measurement of impact.
Stockpile	Stored materials such as product coal, soil, sand, gravel and spoil/waste.
Strain	The change in horizontal distance between two points at the surface after mining, divided by the pre-mining distance between the points and usually expressed in mm/m.
Surface water	Water flowing or held in streams, rivers and other wetlands in the landscape.

Term	Definition
Tributary	A river or stream flowing into a larger river or lake.
Urban design	Urban design is the process and product of designing projects so that they: fit sensitively with the built natural and community environment; contribute to the functioning of the community; and Contribute to the quality of the public domain for the community and road users. Architects, engineers, environmental experts, landscape architects, planners and urban designers are all involved in urban design. Urban designers are generally landscape architects and architects that have extended their expertise into the field of urban design.
View	The sight or prospect of a landscape or scene.
Visibility	The state or fact of being visible or seen.
Visual impact	The impacts on the views from residences, workplaces and public places.
Vulnerable	As defined under the Threatened Species Conservation Act 1995, a species that is facing a high risk of extinction in New South Wales in the medium-term future.
Water table	The surface of saturation in an unconfined aquifer at which the pressure of the water is equal to that of the atmosphere.

Acronyms

Acronym	Term / Definition
AHD	Australian Height Datum
CL	Coal Lease
CHPP	Coal Handling & Preparation Plant
DGRs	Director-General's requirements
DoE	Department of Environment (Cth)
DoPE	Department of Planning and Environment
DPI	Department of Primary Industry
DRE	DTIRIS Division of Resources and Energy
DTIRIS	NSW Department of Trade and Investment, Regional Infrastructure and Services
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EIAG	RMS Guidelines
EIS	Environmental Impact Assessment
EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPBC Act	Environment Protection and Biodiversity Act 1999 (Cth)
EPL	Environment Protection Licence
Ha	Hectare/s
GHG	Greenhouse gas
LEP	Local Environment Plan
LGA	Local Government Area
Mining SEPP	State Environment Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
Mtpa	Million tonnes per annum
OEH	Office of Environment and Heritage
PEA	Preliminary Environmental Assessment
POEO Act	Protection of the Environment Operations Act 1997(NSW)
PRP	Pollution Reduction Program
REA	Rejects emplacement area. Can also be called refuse emplacement area.
REF	Review of Environmental Factors
RNE	Register of the National Estate
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SRLUP	Strategic Regional Land Use Plan
SSC	Singleton Shire Council
TSC Act	Threatened Species Conservation Act 1995 (NSW)
TPH	Total petroleum hydrocarbons

Acronym	Term / Definition
VEM	A Visual Envelope Map, also referred to as 'viewshed' or visual catchment, is the area within which a project can be seen at eye level above ground. Its extent will usually be defined by a combination of landform, vegetation and built elements.
VOC	Volatile organic compounds

Summary

Rix's Creek Mine (the Mine) of Rix's Creek Pty Limited, is owned and operated by Bloomfield Collieries Pty Limited (Bloomfield). The Mine is an open cut coal Mine approximately 5km north-west of Singleton in the Hunter Valley Coalfields of NSW (Figure 1). The Mine currently produces approximately 1.5 million tonnes per annum (Mtpa) of product coal from its existing operations.

Bloomfield is seeking approval for the Rix's Creek Continuation of Mining Project (the Project), which relates to the continued operation of the existing open cut coal Mine. The Project would allow the Mine to continue to operate as an open cut mine, accessed via its existing infrastructure facilities. The Project seeks to continue the existing mining operation at the Mine and increase production to mine up to 4.5mtpa coal per year. The mining methods employed will be the same as those currently active at the Mine, being multi-seam bench open cut techniques.

The mining operations include significant landscape modifications in the form of open cut mining processes. These processes require that material removed from the excavation to be stored on site and contribute to the remodelling of the local landform.

The assessment of the landscape character and visual impact of the proposed ongoing Rix's Creek Mine is undertaken in accordance with the RMS Environmental Impact Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment (RMS Guideline) EIA-N04, issue 2.0 and dated 28 March 2013. In addition to these guidelines, the methodologies described in the Visual Management System prepared by the United States Department of Agriculture Forest Service in 1974 are also utilised in this assessment.

The study area comprises the areas and localities within the region where the proposed mining operations may be within the visual catchment of the views and vistas currently achieved from these locations. A number of ridgelines and flood plains make up the character of the locality and facilitate extensive views of the region from both the public and private domain. The landscape character of the locality are assessed by firstly defining landscape Character Zones and secondly, an analysis of any changes to these landscape Character Zones as a direct result of the ongoing mining operations at Rix's Creek Mine.

From the Character Zones, 12 viewpoints were selected based on data of previous submissions from property owners in the surrounding region as well as locations frequented by tourists or persons passing through the Upper Hunter region. Photographs and survey accurate photomontages were created from multiple angles from these vantage points so as to visually represent the level of visual impact the proposed mining operations will have to the views achieved from the predetermined viewpoints.

The proposed Rix's Creek Continuation of Mining Project is considered to have acceptable landscape character and visual impacts on the surrounding locality and region. As a result of this assessment, it is considered that the proposed mining project is suitable for support on the grounds of landscape character and visual impact assessment.

I.0 Introduction

I.1 Rix's Creek Continuation of Mining Project

This section provides an introduction to the Rix's Creek Mine, the proposed Rix's Creek Continuation of Mining Project (the Project), and the purpose and content of this report.

I.1.1 Overview

Rix's Creek Mine (the Mine) of Rix's Creek Pty Limited, is owned and operated by Bloomfield Collieries Pty Limited (Bloomfield). The Mine is an open cut coal Mine approximately 5km north-west of Singleton in the Hunter Valley Coalfields of NSW (Figure 1). The Mine currently produces approximately 1.5 million tonnes per annum (Mtpa) of product coal from its existing operations.

Bloomfield is seeking approval for the Rix's Creek Continuation of Mining Project (the Project), which relates to the continued operation of the existing open cut coal Mine. The Project would allow the Mine to continue to operate as an open cut mine, accessed via its existing infrastructure facilities.

The Project seeks to extend the life of the existing open cut mining operation at Rix's Creek until approximately 2037. The continuation of mining operations will extend in a north-westerly direction and require a modification to Mine Lease 1432 for an out of pit dump. The continuation of operations will utilise the existing Mine access, Coal Handling and Preparation Plant, coal stockpiling and rail facilities.



Figure 1 Rix's Creek Mining Operations

Source: Department of Lands – Spatial Information Exchange 2013.

1.1.2 Proposed Development

The Project seeks to continue the existing mining operation at the Mine and increase production to mine up to 4.5mtpa coal per year. The mining methods employed will be the same as those currently active at the Mine, being multi-seam bench open cut techniques. Run of Mine (ROM) coal will continue to be processed onsite at the existing CHPP, which has capacity to accept the proposed increase in production. Product coal will then be transported by rail to the Port of Newcastle.

It is estimated that the Mine could yield a total of 32 million saleable tonnes of coal at an overburden ratio of approximately 10.5:1 before coal seams are exhausted.

The components of the proposed development comprise:

- The ongoing use of, and future additions to, the existing Mine fleet;
- Use of the existing Mine infrastructure facilities including the CHPP;
- Continuation of operating hours - 24 hours a day, 7 days a week;
- Use of existing and new rejects and tailings emplacements;
- Rail transport of product coal to the Port of Newcastle;
- Mine closure and rehabilitation; and
- Environmental management.

1.2 Proposed Operations Relevant to the Landscape Character

The continuation of mining operations until approximately 2037 will comprise the extension of the Mine in a north-westerly direction and include an out of pit dump. The components of the ongoing mining operations that are relevant to the landscape character and visual impact assessment include the physical works within the Mine site. These works, including cutting and filling of material, are ongoing and the relocation of stockpiles on the site as the Mine evolves, results in a gradual change to the nature of the landscape in the immediate vicinity of the Mine. These processes may impact on the visual receptors in the region.

The mining operations include significant landscape modifications in the form of open cut mining processes. These processes require that material removed from the excavation to be stored on site and contribute to the remodelling of the local landform.

The purpose of the Landscape Character and Visual Impact Assessment is to evaluate and justify the impact of the storage of material extracted from the Mine site on the surrounding lands and landscaping of the existing mounding adjacent to the New England Highway. The Assessment will utilise modern technology to display survey accurate imagery of the current and proposed mounding within CL352.

The proposed works are to be carried out in 3 stages. Completion of these three stages is proposed to occur in 2023, 2026 and approximately 2037. The landscape character and visual impact assessment will evaluate the impact of the proposal on the landscape and visual amenity of the locality at these three key stages.

1.3 Purpose of the Report

1.3.1 Director-Generals Requirements

The request for the Director General's Requirements included a preliminary *Environmental Assessment* prepared by AECOM dated 21 November 2013. This report formed the basis of the preparation of preliminary assessment by the NSW Department of Planning and Environment. The application (Application Number SSD 6300) for the Director General's Environmental Assessment Requirements proposed:

The Rix's Creek Extension Project, which includes:

- extending open cut mining operations northwards of Pit 3 to recover an additional 32 million tonnes (Mt) of saleable coal over a period of 21 years;
- increasing the extraction rate of Run-of-Mine (ROM) coal from 2.5 Mt a year to 4.5 Mt a year;
- extending the western boundary of the existing mining lease to accommodate the proposed out of pit overburden dump;
- increasing the hours of operation of the coal handling and processing plant (CHPP) from 4.5 days a week, to 7 days a week;
- transporting up to 2.7 Mt of saleable coal a year via rail;
- continued use of existing tailings emplacements;
- construction and use of a second New England Highway underpass; and
- progressive rehabilitation of the site.

The Director General's Requirements were issued on 3 March 2013 under the provisions of the Section 78A(8A) of the Environmental Planning and Assessment Act 1979. Requirements relevant to the landscape and visual impact assessment include:

- **Visual** – including:
 - » a detailed assessment of the:
 - changing landforms on the site during the various stages of the development; and
 - potential visual impacts of the development on private landowners in the surrounding area as well as key vantage points in the public domain, including photomontages and lighting impacts; and
 - » a detailed description of the measures that would be implemented to minimise the visual impacts of the development;

1.3.2 Landscape Character and Visual Impact Assessment Objectives

The proposed ongoing mining operations will necessitate the clearance of vegetation and comprise disturbance of the existing topography and natural landform.

The objectives of the Landscape Character and Visual Impact Assessment are to:

- Accurately represent the changing landform of the locality as a result of the mining operations at three key stages of development in the form of photomontages from both public and privately accessible vantage points; and
- Ensure the minimisation of any impacts on the landscape character and visual impact to sensitive receivers as a result of any changes on the topography that will occur during the lifecycle of the Mine.

2.0 Methodology

2.1 Legislation, Policy, Criteria and/or Guidelines

The assessment of the landscape character and visual impact of the proposed ongoing Rix's Creek Mine is undertaken in accordance with the RMS Environmental Impact Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment (RMS Guideline) EIA-N04, issue 2.0 and dated 28 March 2013. In addition to these guidelines, the methodologies described in the Visual Management System prepared by the United States Department of Agriculture Forest Service in 1974 are also utilised in this assessment. The basis of this methodology measures the degree of visual sensitivity from surrounding land uses based on the degree of modification to the visual landscape and vistas.

2.2 Study Area

Rix's Creek Mine is located approximately 5km north west of Singleton in the Hunter Valley. The area is characterised by generally low relief topography with a number of prominent ridgelines adjoining the western and northern boundaries of the site, measuring up to 165m AHD.

The New England Highway to the north of Singleton tracks through the centre of ML 1432 and separates the operational mine into distinct pits. The west pit, located west of the New England Highway, is an active open cut mining area which is proposed to be increased in size under the current application. The old north pit is located to the east of the New England Highway and will also comprise ongoing mining operations under the proposal.

The ongoing mining operations are likely to involve landscape modifications that may be visible from the surrounding locality including the New England Highway, The Golden Highway to the south east of the site, private and publicly accessed ridges in the Singleton region and a number of privately owned properties to the east and west of the subject mining operations.

For the purpose of this assessment a selection of sites has been identified based on topographical information of the locality, local knowledge and historical community submission information.

2.3 Method of Landscape Character and Visual Impact Assessment

2.3.1 Landscape Character

The landscape character of the locality will be assessed by firstly defining landscape Character Zones and secondly an analysis of any changes to these landscape Character Zones as a direct result of the ongoing mining operations at Rix's Creek Mine.

Landscape character is defined in the RMS Guideline as:

'The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.' (EIA-N04, RMS Guidelines, 2013)

The landscape Character Zones are created by division of the study area into zones that can be categorised by topographical, spatial or landscape character properties. Each of these zones are assessed against the magnitude of the changes to each zone and the sensitivity of each of these zones to change.

2.3.2 Visual Impacts

Visibility

The project realities require that both static and mobile receivers be considered. Users of the New England Highway and the Golden Highway will experience change in their view catchment. A number of static receivers which includes both private landholdings and public spaces including lookouts may also experience changes in their view catchment.

Mobile Receivers

The mobile receivers are considered to be the most highly affected by the proposed works. These include the users of the New England Highway, and to a lesser extent, the Golden Highway. A number of photomontages will be required to illustrate the proposed changes to the visual catchment of the road uses through the ML 1432 area over the life of the proposed works.

Static Receivers

A number of static receivers which have direct views of the Mine site and proposed works have been identified. These receivers include dwellings and public spaces such as lookouts and momentary views from public roads. Photomontages will be required to illustrate the proposed changes to the visual catchment at these points.

2.3.3 Visual Sensitivity

Visual sensitivity is a measure of how a change in the environment may be viewed from points or areas in the immediate locality or wider region. Different land uses within each locality have different sensitivity to change. For instance, agricultural land users may not be critical of changes to the topography of a hillside 1km away however, a tourist using the Highway adjacent to the farm may see the change much more critically.

A proposed development may impact on the visual sensitivity of view catchments at different levels depending on the characteristics of the local and regional landform. The following characteristics used in this assessment include:

- Land use;
- Distance to the development; and

- Visibility from view points

The level of viewer sensitivity is based on the table below:

Table 1 Visual Sensitivity Matrix

Visual Use Area	Foreground		Middle ground		Background
	Local Setting		Sub Regional Setting		Regional Setting
	0 - 0.5km	0.5 - 1km	1 - 2.5km	2.5 - 5km	> 5km
Residences/township	High	High	High	Moderate	Low
Tourist/Recreation areas	High	Moderate	Moderate	Low	Low
Highways/Tourist Routes	High	Moderate	Moderate	Low	Low
Secondary Roads	Moderate	Moderate	Low	Low	Negligible
Local Roads	Low	Low	Low	Negligible	Negligible
Industrial Areas	Low	Low	Low	Negligible	Negligible
Agricultural Areas	Low	Low	Low	Negligible	Negligible
Mining Areas	Negligible	Negligible	Negligible	Negligible	Negligible

2.3.4 Landscape Character and Visual Assessment Grading Matrix

The Landscape Character and Visual Assessment Grading Matrix (the Matrix) is utilised to compare the sensitivity of an environment to change and the magnitude of the proposed changes. The sensitivity refers to the ability of receivers and the character of the locality to cope with changes to the environment. Magnitude refers to the scale, distance and character of the proposed changes in the locality or region.

Table 2 Landscape Character and Visual Assessment Grading Matrix

		Magnitude					
		High	High-Moderate	Moderate	Moderate-Low	Low	Negligible
Sensitivity	High	High Impact	High Impact	Moderate-High Impact	Moderate-High Impact	Moderate Impact	Negligible
	High-Moderate	High Impact	Moderate-High Impact	Moderate-High Impact	Moderate Impact	Moderate Impact	Negligible
	Moderate	Moderate-High Impact	Moderate-High Impact	Moderate Impact	Moderate Impact	Moderate-Low Impact	Negligible
	Moderate-Low	Moderate-High Impact	Moderate Impact	Moderate Impact	Moderate-Low Impact	Moderate-Low Impact	Negligible
	Low	Moderate Impact	Moderate Impact	Moderate-Low Impact	Moderate-Low Impact	Low Impact	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

2.3.5 Photomontage Methodology

A digital photomontage that represents the view of a human eye is extremely effective and mathematically reliable to demonstrate an observer's line of sight or the visual impact of a design structure or landscape modification. The process involves taking a digital photograph and then mathematically inserting a design model within it.

The camera used for the photomontages was a Canon EOS 400D with a Canon 24mm EF lens.

In the field photographs are taken from a camera at standing eye level (approx. 1.6m). The camera is mounted on a theodolite using a custom made bracket to control its bearing and tilt. Instrument location and orientation is determined using real time satellite positioning systems (GNSS and CORS). Additional features within the photographs are located to provide validation and accuracy checks.

The field data is reduced and modelled in AutoCAD on the same coordinate system as the model of the proposed earthworks. Virtual cameras are setup in AutoCAD at the locations and orientations determined through field survey, and the photograph is inserted into the camera view.

Taking a view through the camera in AutoCAD, features surveyed in the field (e.g. fence post, tree) will overlay onto the corresponding features on the photo. If the existing features from the model overlay in accordance with the existing features in the photograph, then it follows that the proposed landscape modifications modelled in AutoCAD is also overlayed at the correct scale and locations on the photograph, creating an accurate photomontage.

After the photomontage is created, the photo is then further cropped to display a view that is equivalent to a 50mm lens on a 35mm film camera, which approximates the perspective of the human eye.

3.0 Existing Environment

3.1 Study Area Context

The study area is relatively wide and varied in character, extending from Wittingham to the south of Singleton on the New England Highway, west to Mount Thorley on the corner of Putty Road and the Golden Highway, north to along the Hunter River to Maison Dieu Area, north of the Mine along the New England Highway to Camberwall and Glennies Creek and west to Wattle Ponds (Figure 2).

The study area comprises the areas and localities within the region where the proposed mining operations may be within the visual catchment of the views and vistas currently achieved from these locations. A number of ridgelines and flood plains make up the character of the locality and facilitate extensive views of the region from both the public and private domain.

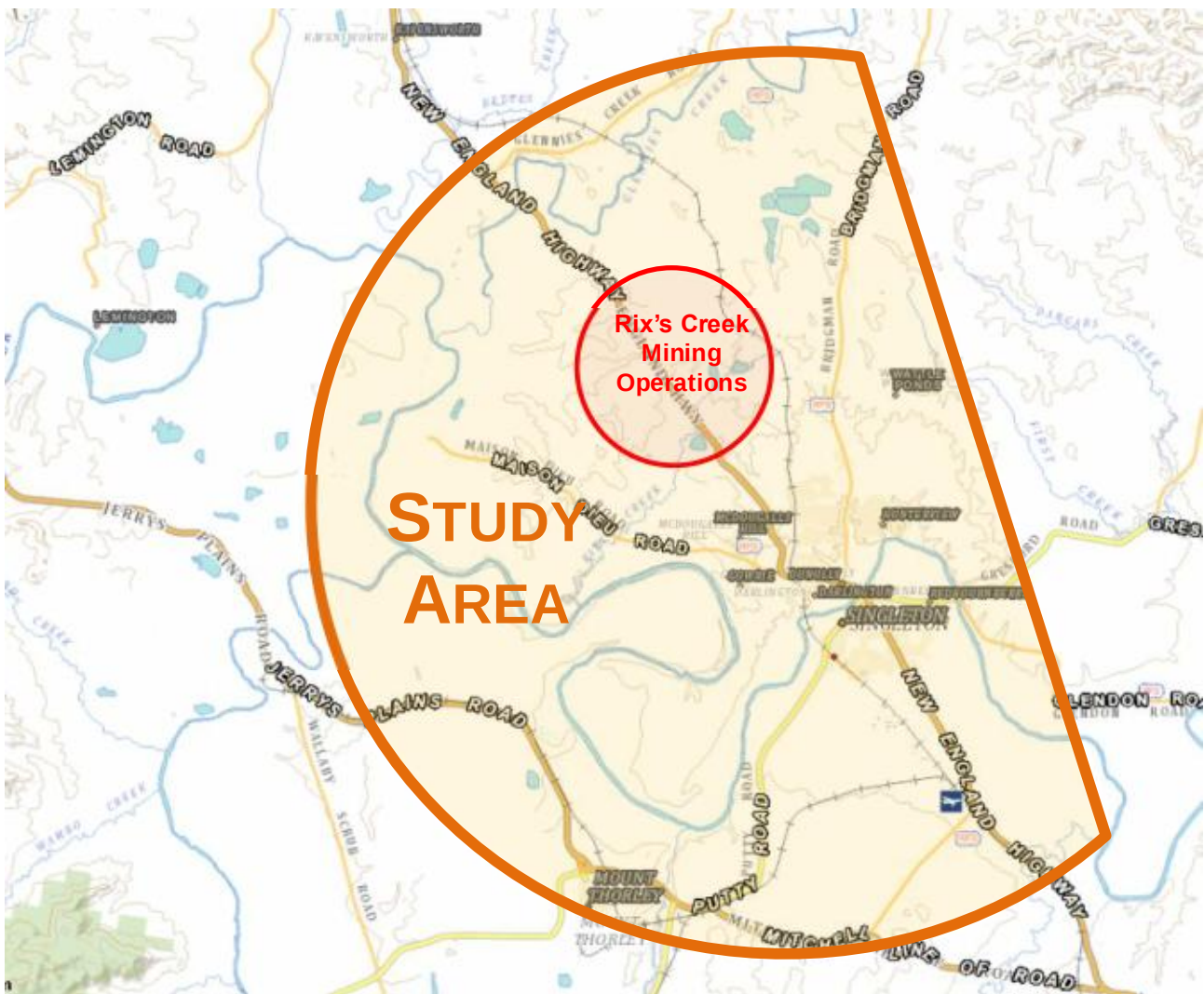


Figure 2 Landscape Character and Visual Impact Study Area

Source: Department of Lands – Spatial Information Exchange 2013.

3.2 Existing Landscape Character and Development Conditions

3.2.1 Landscape Character Zones

The study area can be divided in the following landscape Character Zones:

Character Zone 1 – New England Highway adjacent to north and west pits of Rix's Creek Mine.

The New England Highway passes through ML 1432 with the Rix's Creek Mine operating on both the eastern and western sides of the road. Trees generally line the New England Highway for its entire length through ML 1432, however, significant bunding has been constructed along the eastern and western boundaries of the road corridor for some sections of Highway (detailed in Figure 3). The existing bunding is 2-4 metres above the road and is generally vegetated with grasses and shrubs for stabilisation.

Despite the bunding, there are a number of places along this section of road where district views are enjoyed by road users and the mining operations can be seen in the foreground. The west pit open cut mine, the old north pit, access tracks, spoil mounds and stockpiles can be seen by road users travelling in both directions.

Generally the visual character of this Character Zone is a highly disturbed landscape with artificial tree planting and landscape modifications comprising the bulk of the visual landform. The proposed development of the Mine includes substantial altering of this landscape with significant rehabilitation throughout the lifecycle of the Mine. The area is not considered to be sensitive and may be able to endure high magnitude change.

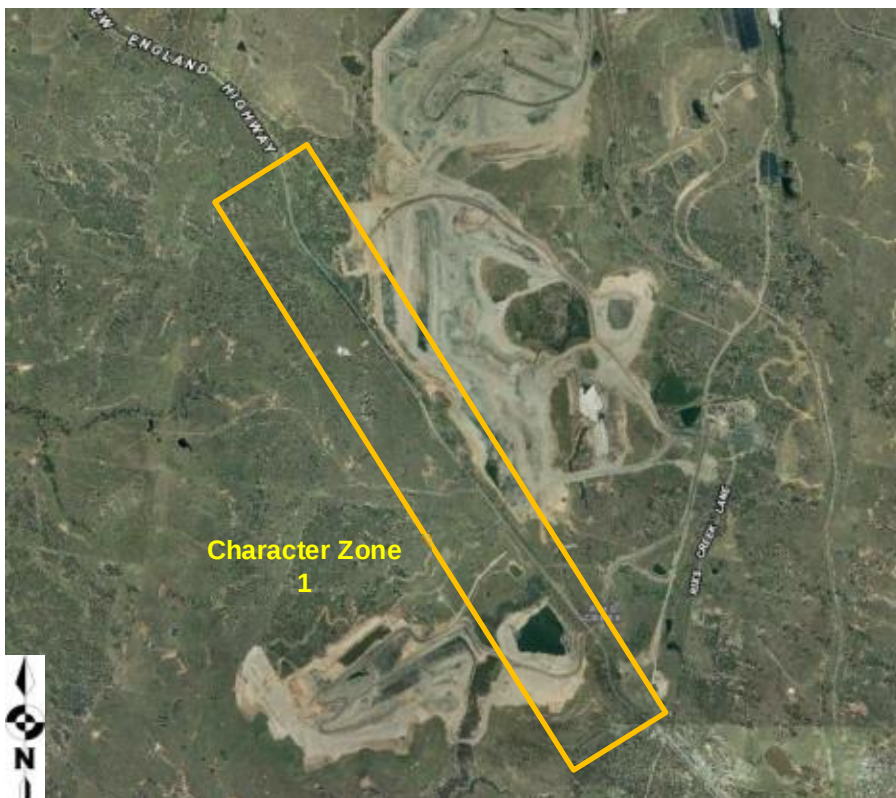


Figure 3 Landscape Character and Visual Impact Study Area

Source: Department of Lands – Spatial Information Exchange 2013

Assessment of Landscape Character Change

The proposed modifications to the landscape and ongoing operations of Rix's Creek mine will have a direct result on the landscape character within Landscape Character Zone 1. The users of the Highway will experience ongoing foreground and mid-ground changes to the landscape as mining on the site progresses and the modifications to the Highway corridor take form.

It is proposed to establish a more consistent bunding along the New England Highway corridor to screen the new mining works from the view of passing motorists. The works involve excavating and mining to the west of the Highway which will be easily seen within the current landform. Additional bunding will be constructed similar to the current bunds along the New England Highway and the vegetation of the bunding will soften and further screen the mining works beyond.

The second New England Highway underpass will be screened in a similar manner to the existing structure, and vegetation of the bunding will soften and further screen the mining works beyond.

The Character Zone is currently highly modified and is within the existing mine. As a result the visual sensitivity of the proposed development on the users of the New England Highway is considered to be negligible, considering the existing landform in the immediate locality and the current views and vistas. The high magnitude of the changes is considered to have a negligible impact on the sensitive receivers and the proposed works will improve the visual amenity of the locality over the course of the project timeline.

Character Zone 2 – Wittingham

Character Zone 2 is located to the south of Singleton Township on the New England Highway. The zone comprises the floodplain to the west of the Hunter River, Singleton Airport, and contains the railway which follows the Highway and connects Newcastle to Singleton. The zone is flat and open with minimal tree cover, and the land uses are primarily agricultural with clear evidence of residential dwellings and agricultural buildings scattered throughout the landscape.

Rix's Creek Mine is located approximately 10km from Character Zone 2 and it is therefore considered that the zone is not sensitive to a high magnitude change in the landscape at Rix's Creek Mine.

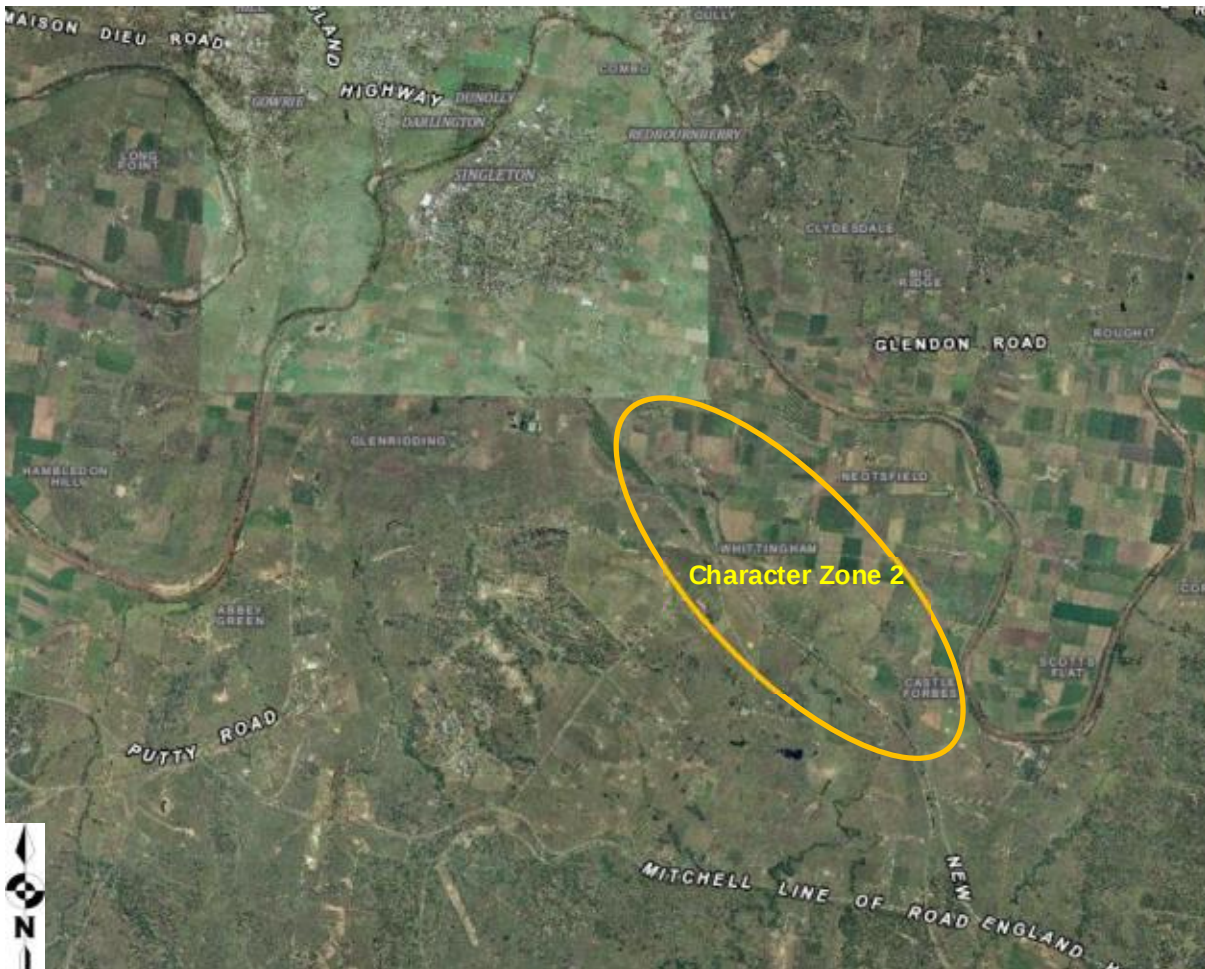


Figure 4 Landscape Character and Visual Impact Study Area
Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development. The changes to the landscape at Rix's Creek Mine may be visible from specific locations within the Character Zone. These sensitive receivers are assessed in Part 4 of this report.

Character Zone 3 – Mount Thorley and Jerrys Plains Road

Similar to Character Zone 2, Character Zone 3 incorporates the Hunter River Floodplain. The Character Zone includes Mount Thorley which is located to the west of the Hunter River and south west of Singleton. A view corridor from Mount Thorley to Rix's Creek Mine is apparent north along the flood plain of the Hunter River and into the rolling hills and existing rehabilitated landscape to the west of Singleton and Singleton Heights.

Rix's Creek Mine is located approximately 9km north of Mount Thorley. The floodplain is unobstructed by vegetation or significant built form and can be characterised as productive agricultural land. Further development of the Mine site, including increased stockpile heights and clearing of vegetation, may be visible from the Golden Highway and Putty Road users as well as a small number of residential and agricultural properties in this Character Zone.

The current landscape has potential to be highly sensitive to change however the long viewing distance and the setting of the landscape modifications within the rolling hills to the north of the Hunter River Flood Plain are likely to reduce any impact on the Character Zone.

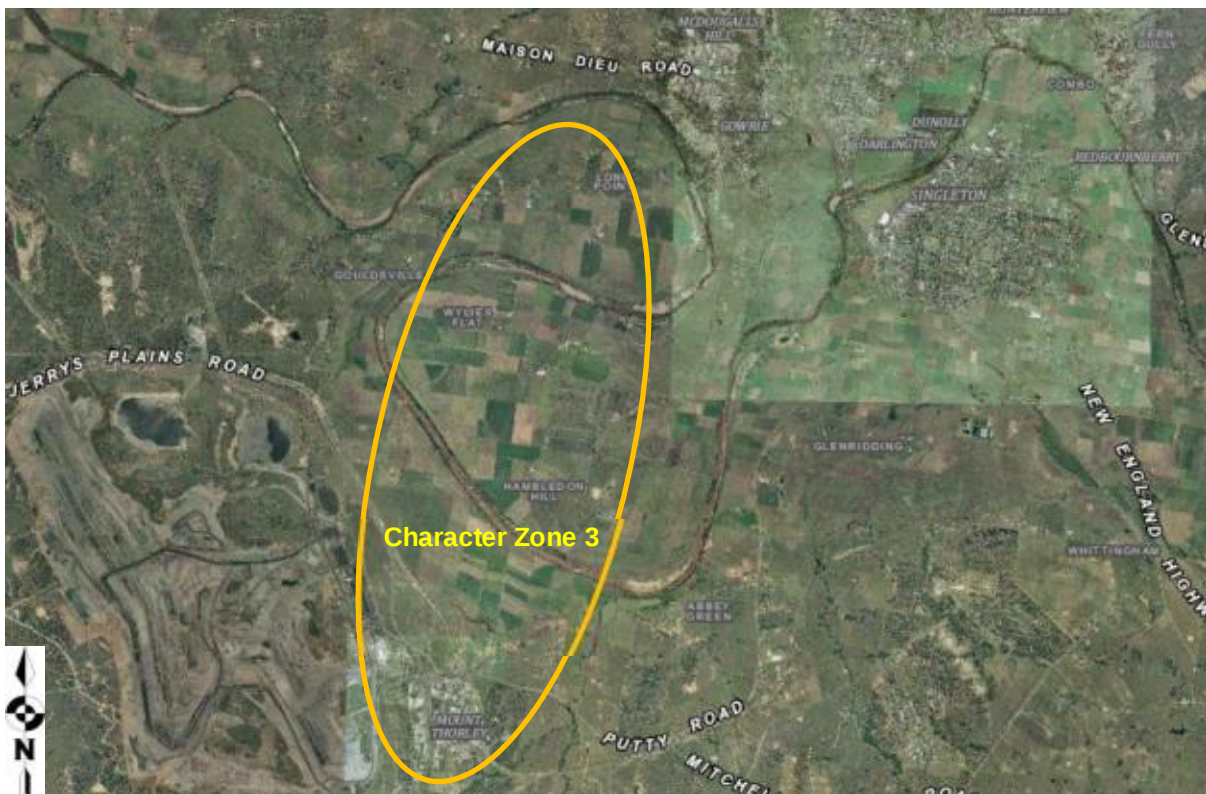


Figure 5 Landscape Character and Visual Impact Study Area
Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development. The changes to the landscape at Rix's Creek Mine may be visible from specific locations within the Character Zone. These sensitive receivers are assessed in Part 4 of this report.

Character Zone 4 – Maison Dieu Area

The Maison Dieu Area is characterised by generally rolling hills adjacent to the floodplain of the Hunter River. The locality is comprised of farmland on the floodplain and forested and cleared grazing land on the higher country. Maison Dieu Road runs east/west and provides the main access to the locality. The road follows the ridgeline of the hill and is lined with native vegetation along the ridgelines, restricting views in some locations to the north and south from the road.

The town of Maison Dieu is located on the western slope of the ridge in an un-forested area above the floodplain. The land uses in the area are dominated by agriculture, and the floodplain contains few trees and open grassland with a scattering of dwellings and outbuildings.

The Character Zone is located to the west of ML1432 and the existing vegetation screens clear views from being enjoyed from Maison Dieu Road. Due to the screening the proposed works are likely to have very little long term impact on the visual catchment.



Figure 6 Landscape Character and Visual Impact Study Area

Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development. The changes to the landscape at Rix's Creek Mine may be visible from specific locations within the Character Zone. These sensitive receivers are assessed in Part 4 of this report.

Character Zone 5 – Camberwall and Glennies Creek

Camberwall and Glennies Creek are located to the north of the Rix's Creek Mine and comprise localities which experience higher levels of elevation change than elsewhere in the region. The Character Zone 5 incorporates the Hunter River upstream of Character Zones 2 through 4.

The Hunter River does not contain a distinct flood plain in this zone, and the river cuts through rolling hills. The low lying areas in this locality are utilised for grazing and other agricultural uses, while the higher slopes and ridgelines tend to contain trees and other substantial vegetation.

The rolling and meandering nature of the topography of zone indicate that the locality is not sensitive to small magnitude change as this change will generally be viewed from the sensitive receivers in the locality.

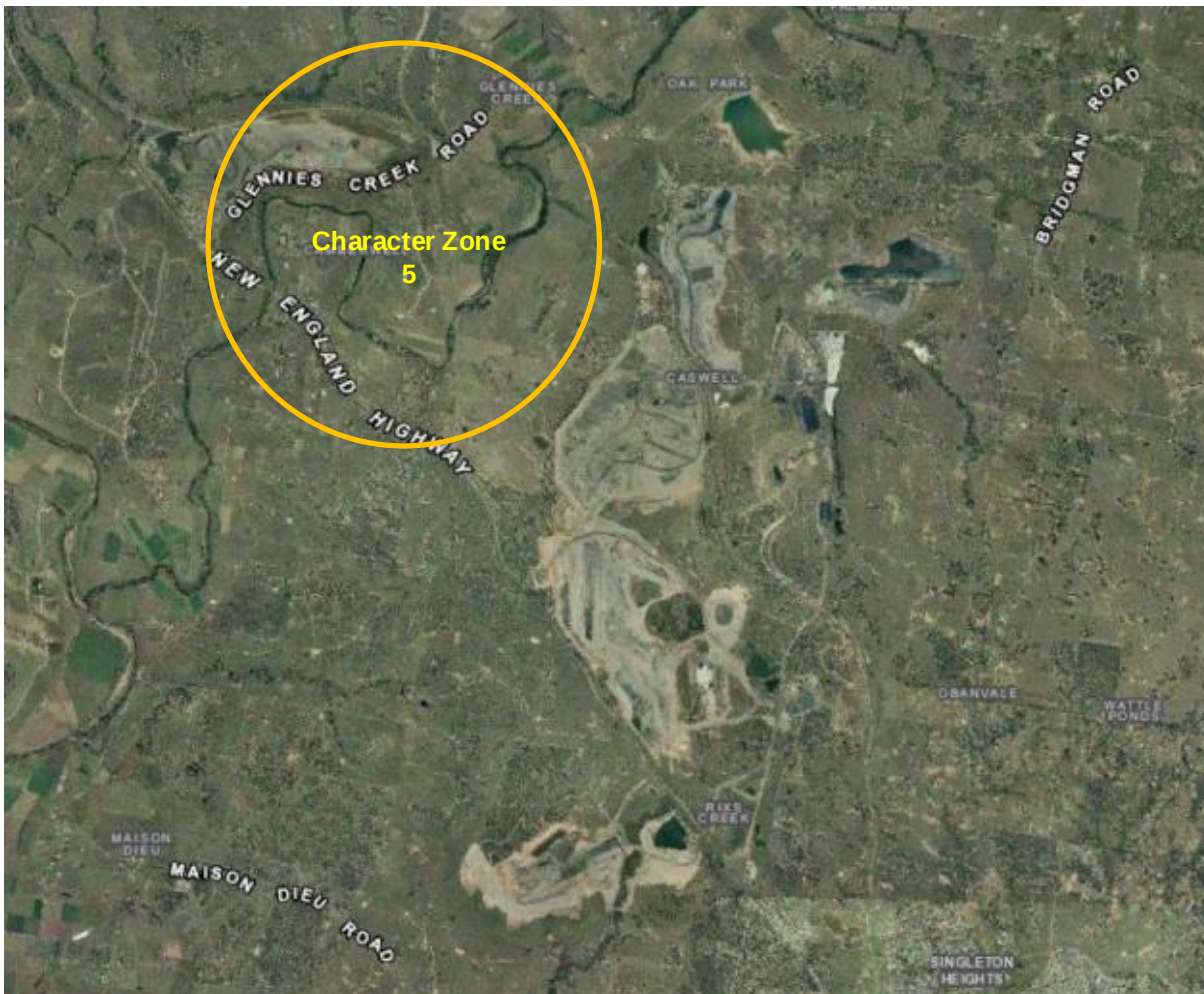


Figure 7 Landscape Character and Visual Impact Study Area
Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development. The changes to the landscape at Rix's Creek Mine may be visible from specific locations within the Character Zone. These sensitive receivers are assessed in Part 4 of this report.

Character Zone 6 – Wattle Ponds

Wattle Ponds is located approximately 5km north of Singleton and approximately 3km east of Rix's Creek Mine. The area features a small township with larger rural residential or lifestyle housing style blocks. Wattle Ponds is located on the ridge of a hill with a height of approximately 140 AHD which provides for excellent views of the surrounding region between gaps in the tree cover.

The low lying country to the west of the character area is primarily used for agricultural uses with Bridgman Road and the Main Northern Railway separating the Character Area from the Mine.



Figure 8 Landscape Character and Visual Impact Study Area

Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development. The changes to the landscape at Rix's Creek Mine may be visible from specific locations within the Character Zone. These sensitive receivers are assessed in Part 4 of this report.

Character Zone 7 – Hambledon Hill

Hambledon Hill is located in Gowrie, approximately 2.8km from Rix's Creek Mine. Hambledon Hill is to the north west of Singleton and features a public lookout on the crest of the Hill. The locality is primarily residential, with an industrial precinct located immediately north of Gowrie and adjacent to the New England Highway. The Hunter River boards the western fringes of Gowrie and frames the western periphery of Hambledon Hill.

The lookout at the top of Hambledon Hill facilitates 360 degree views; however, tree cover prevents a view of the horizon except to the south west towards Long Point and Jerrys Plains.

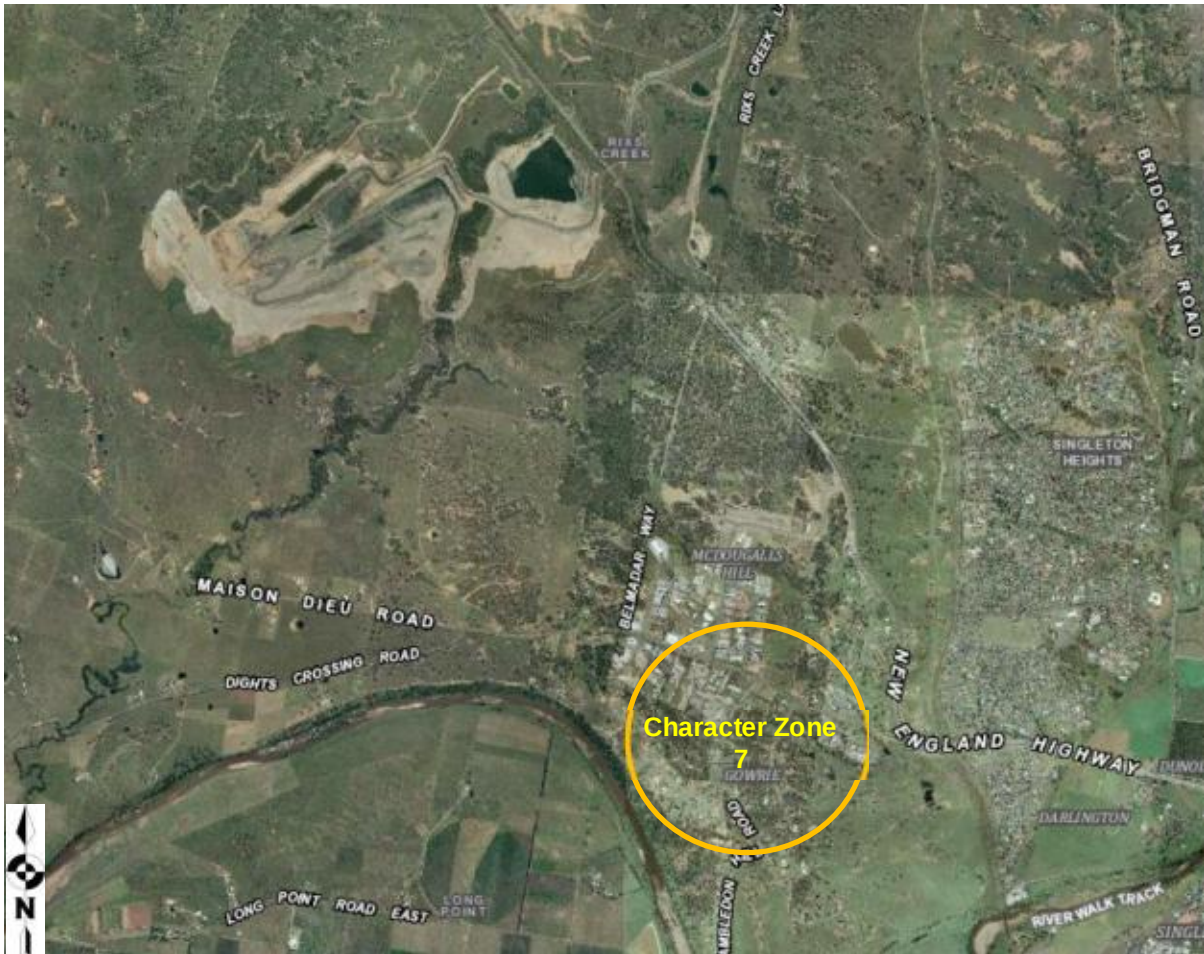


Figure 9 Landscape Character and Visual Impact Study Area

Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development. The changes to the landscape at Rix's Creek Mine may be visible from specific locations within the Character Zone. These sensitive receivers are assessed in Part 4 of this report.

Character Zone 8 – Singleton Heights

Singleton Heights is located to the south west of Rix's Creek Mine on the eastern side of the New England Highway. Singleton Heights is a residential suburb to the north of Singleton, characterised by single and two storey detached dwellings. Singleton Heights is separated from Rix's Creek Mine by a ridgeline which screens the mine from view of the residential properties.

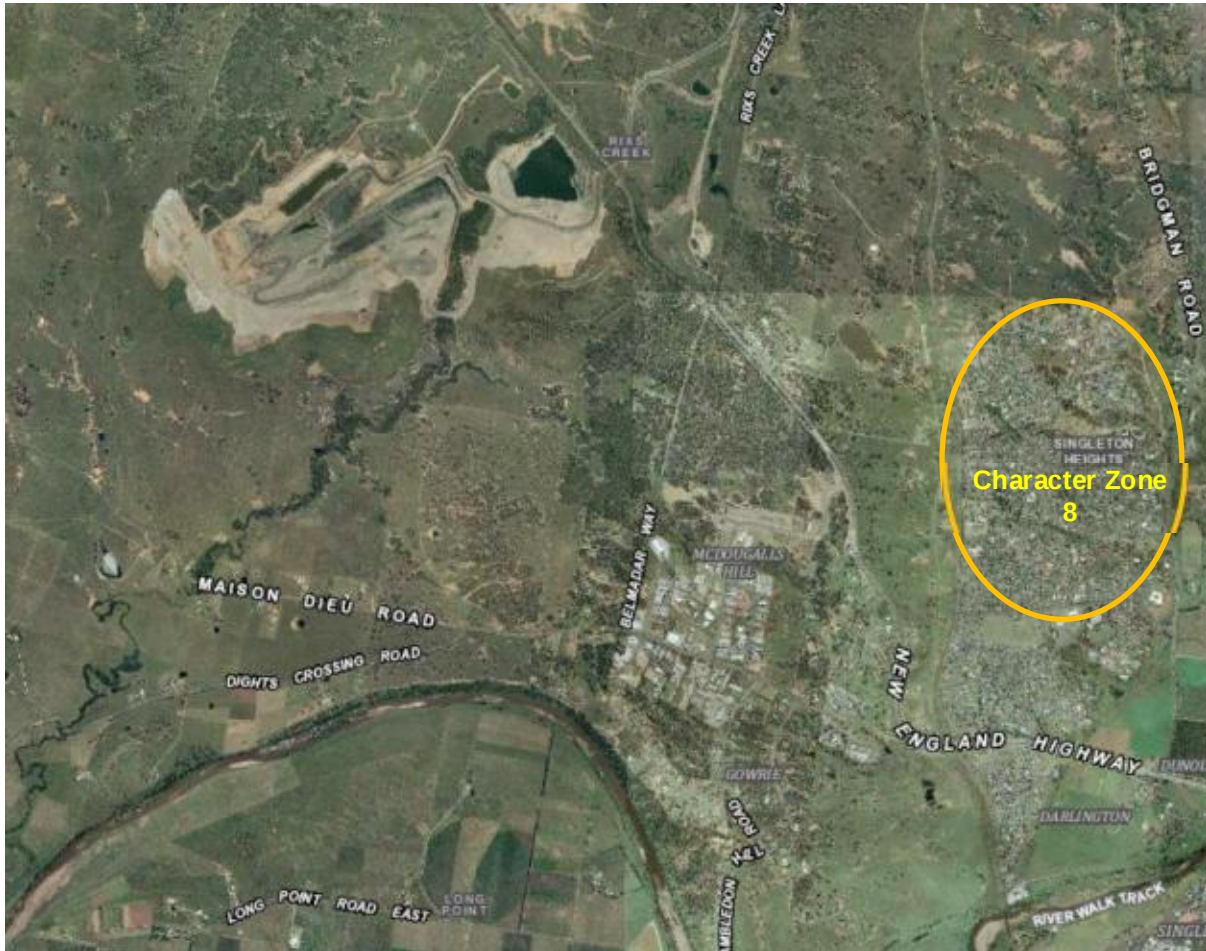


Figure 10 Landscape Character and Visual Impact Study Area
Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development nor will the proposed development be visible from the Character Zone.

Character Zone 9 – Maison Dieu Road and Dights Crossing Road

The intersection of Maison Dieu Road and Dights Crossing Road is the focal point of the character zone which is located approximately 2km from the proposed Rix's Creek mining operations.

The Character Zone of Maison Dieu Road and Dights Crossing Road is defined by the rolling and meandering nature of the topography the locality. The locality is sensitive to small magnitude change considering to openness of the grazing land and the district views both up and down the valley. The Hunter River does not contain a distinct flood plain in this zone, and the river cuts through rolling hills. The low lying areas in this locality are utilised for grazing and other agricultural uses.

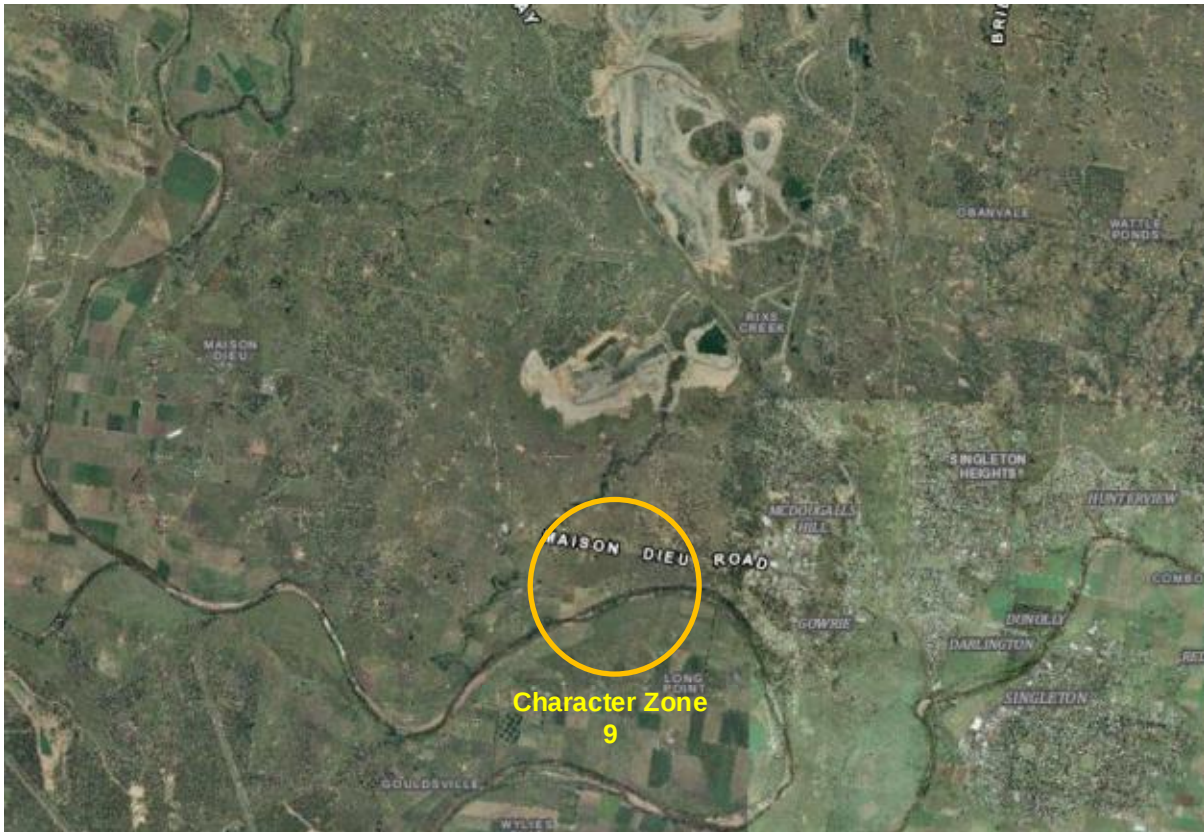


Figure 11 Landscape Character and Visual Impact Study Area
Source: Department of Lands – Spatial Information Exchange 2013.

Assessment of Landscape Character Change

The Character Zone will not experience any direct change to the landscape as a result of the proposed development however the views from the Character Zone to the north will, be affected which is discussed further in Part 4 of this report. The increased height of the hill immediately to the north of the zone will have an impact on the visual character of the views to the north of the zone. The existing natural landform as viewed from the south, across the rolling grassy terrain will be interrupted by a significantly larger stockpile of spoil and overburden. There are limited opportunities to mitigate the impact of the stockpiling on the Character Zone in the short term however, in the medium to longer lifespan of the project, the stockpiling will be rehabilitated to appear as a natural landform.

4.0 Impact Assessment

4.1 Viewpoint Locations

The viewpoint locations were chosen within the Landscape Character Zones where historical data revealed that concerns had been raised relating to mining activities or local topography presented a specific view of the proposed mining activities. Photos were taken from each chosen viewpoint in a number of angles to clearly identify the impact on the view from that sensitive receiver. The selected viewpoints are shown in Figure 12.

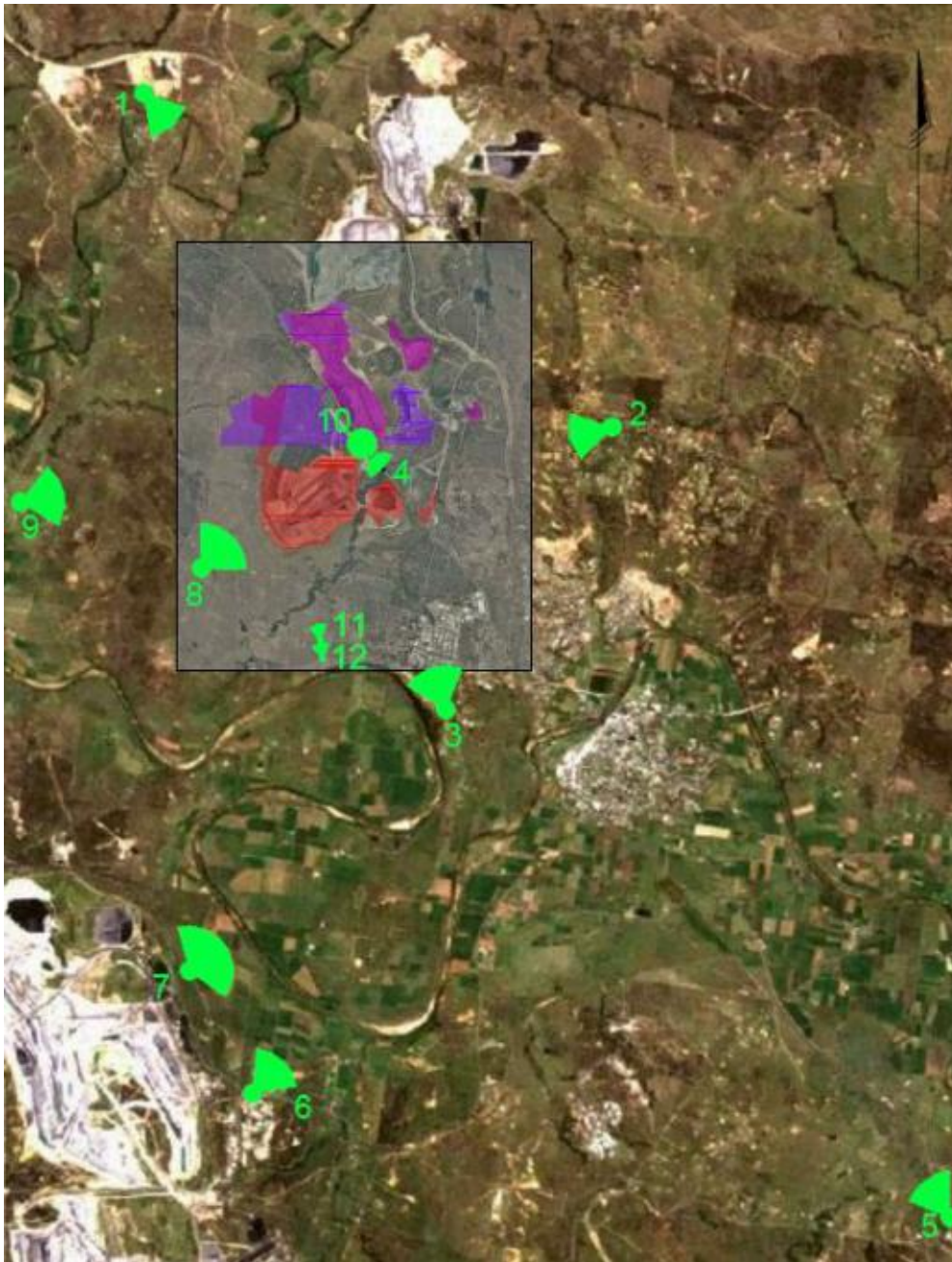


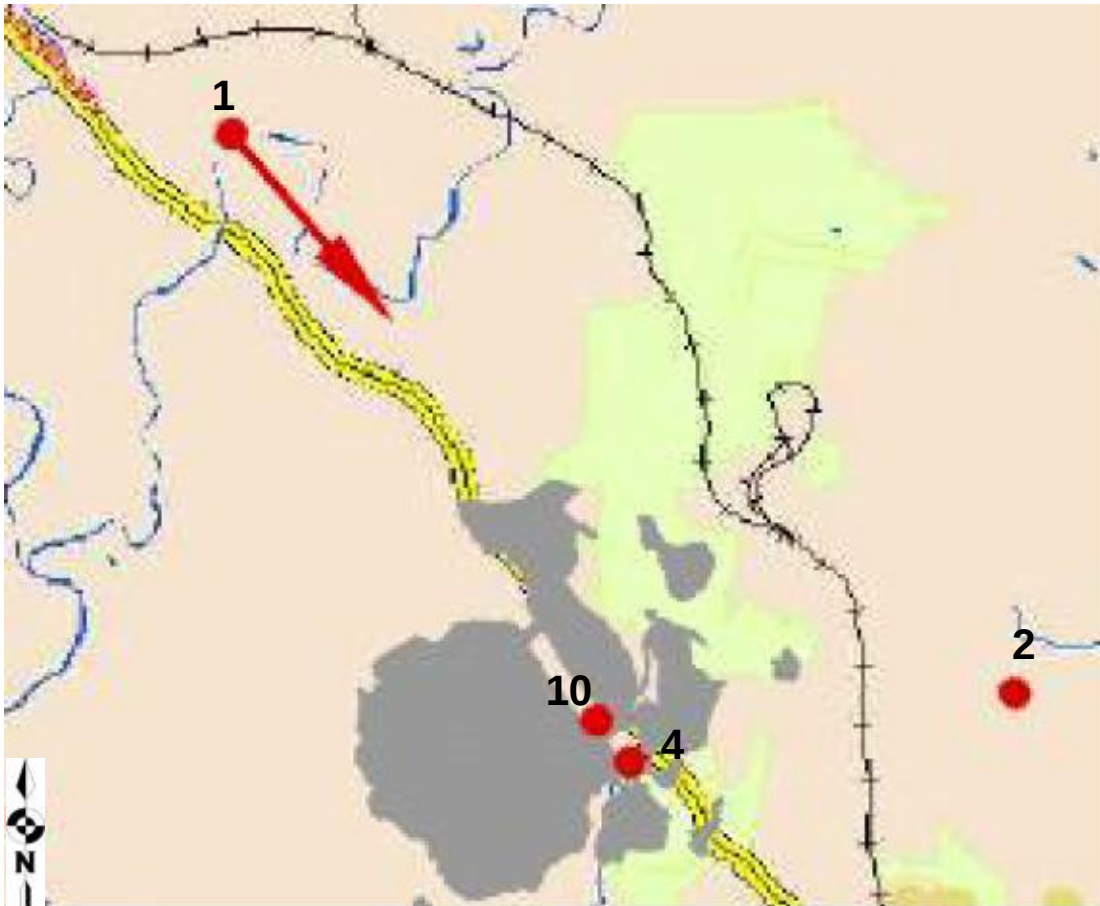
Figure 12 Viewpoint Locations

Source: Department of Lands – Spatial Information Exchange 2013.

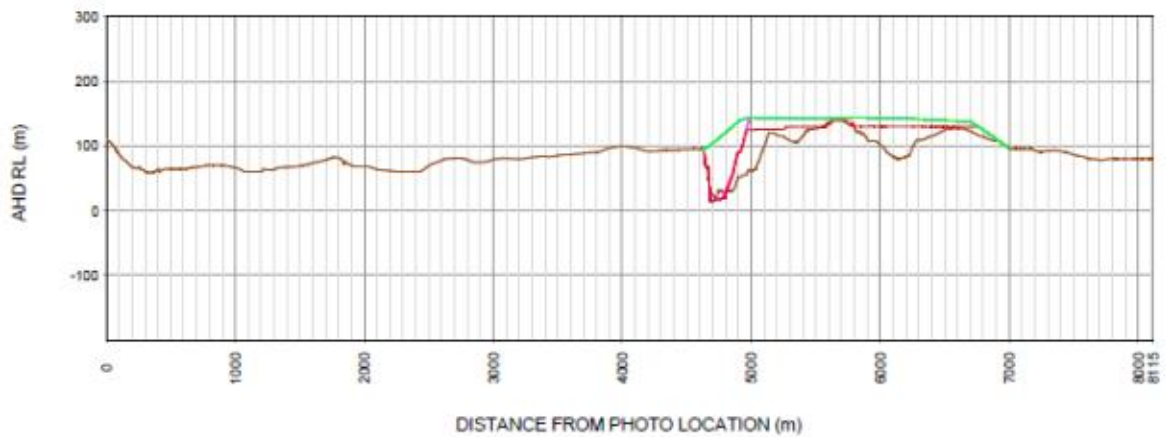
4.2 Photomontage Pre and Post Development Assessment

Table 3 Viewpoint 1a – New England Highway 1

Viewpoint 1a – New England Highway 1	
View Location	New England Highway near Glennies Creek Road, Camberwell.
View Distance	5km
Character Zone	Character Zone 5
Visual Setting	Sub-Regional
Visual Modifications	The visual modifications will include slight modification of the horizon over the lifespan of the project. The modifications to the horizon will include the changing of form of the landscape within the mining site which currently creates the definition between the landscape and the sky. The section of the mine closest to this viewpoint is proposed to be filled with spoil material and the height of the landscape will be slightly increased as a result. The fill material will be returned to a rehabilitated state on completion of the mining project.
Land Use	Highways/Tourist Routes
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – Moderate-Low The visual impact will include the slight modification of the horizon however the slight lift in the horizon does not restrict views beyond the mine. The current views from this location include bare earth and the addition of fill material and slight increase in height will have a moderate to low impact on the sensitive receiver. The potential visual impact is considered reasonable from the sensitive receiver at Viewpoint 1a

**Figure 13 Viewpoint Direction**

Source: RPS Australia East Pty Ltd 2014.



- View Direction
- Current landscape
- Landscape at 2017
- Landscape at 2020
- Landscape at 2023
- Landscape at 2026
- Landscape at 2038 (completion)

Figure 14 Cross Section from Viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 1 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 2 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 3 Field of view at 2020

Source: RPS Australia East Pty Ltd 2014.



Plate 4 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 5 Field of view at 2026

Source: RPS Australia East Pty Ltd 2014.



Plate 6 Field of view at 2038 (completion)

Source: RPS Australia East Pty Ltd 2014.

Table 4 Viewpoint 1b – New England Highway 1

Viewpoint 1b – New England Highway 1	
View Location	New England Highway near Glennies Creek Road, Camberwell.
View Distance	5km
Character Zone	Character Zone 5
Visual Setting	Sub-Regional
Visual Modifications	The proposed mining operations will be visible between the gaps in the vegetation that fringe the Highway. The mine proposes to make modifications to the landscape beyond the hill in the foreground. These modifications will include the removal of existing vegetation which will be replaced with fill material modifying the shape of the landform, as can be seen in Figure 20. The visual modifications will appear as fill material in the medium ground which will be revegetated on completion of the mining project.
Land Use	Highways/Tourist Routes
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade - Moderate-low The proposed landscape modifications will result in the removal of the vegetation from the middle ground of the view which will be replaced with raw earth material being the spoil from the mining site. This material will not extend above the existing horizon however it may remove vegetation from the horizon in some places. The mine and fill material may be marginally visible from this location on the Highway between the gaps in the vegetation. The potential visual impact is considered reasonable from the sensitive receiver at Viewpoint 1b.

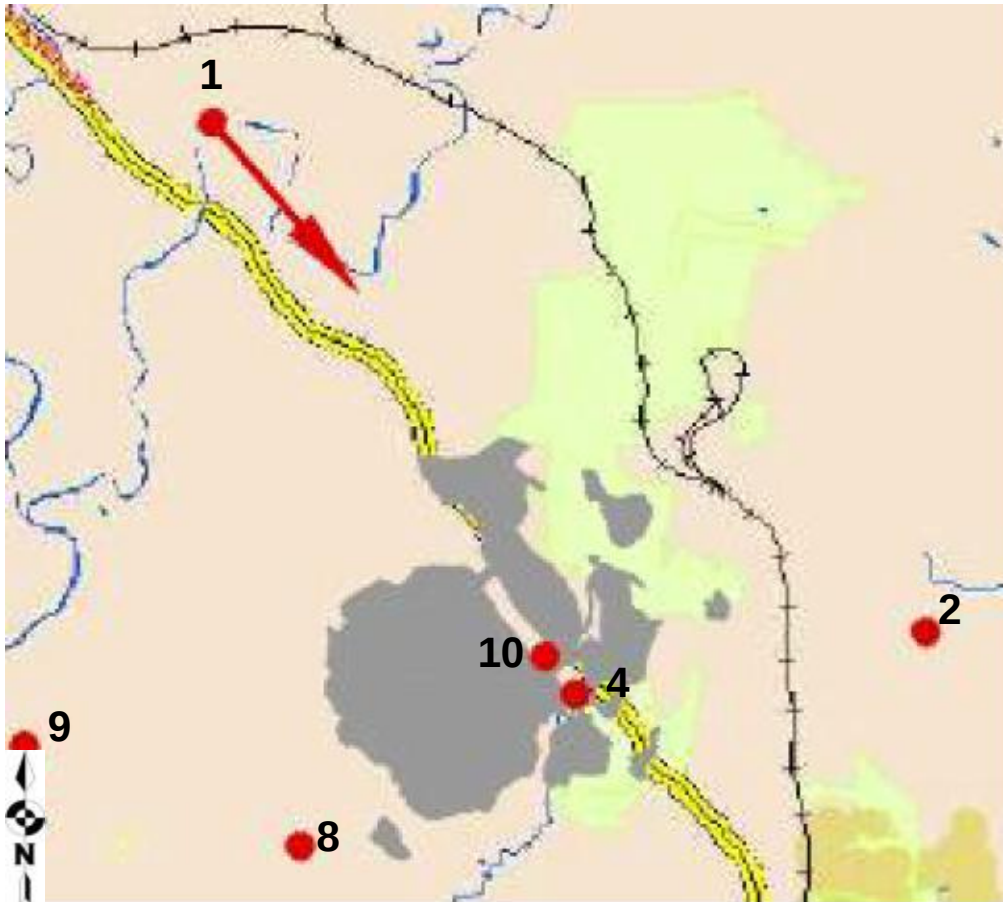


Figure 15 Viewpoint Direction

Source: RPS Australia East Pty Ltd 2014.

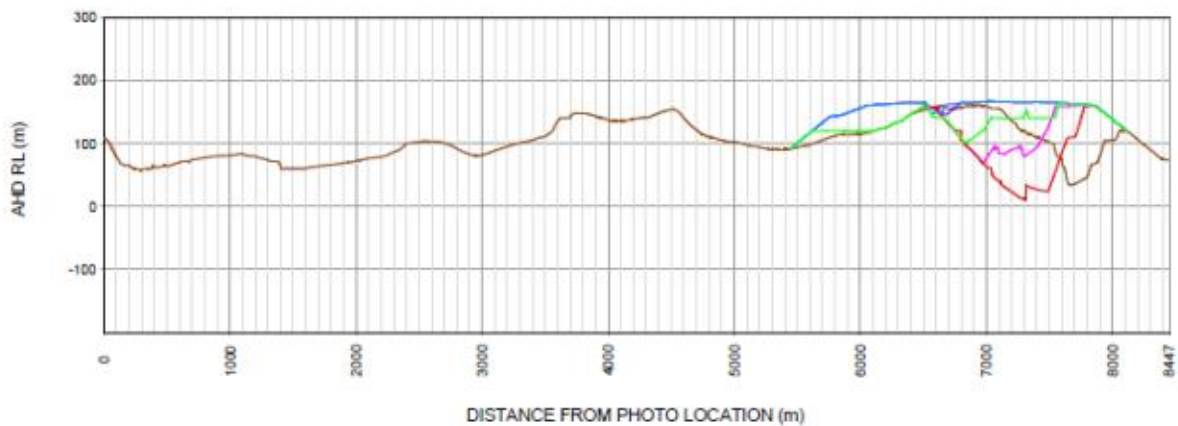


Figure 16 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 7 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 8 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 9 Field of view at 2020

Source: RPS Australia East Pty Ltd 2014.



Plate 10 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 11 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 12 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 5 Viewpoint 2 – Lester Close, Wattle Ponds

Viewpoint 2 – Lester Close, Wattle Ponds	
View Location	Lester Close adjacent to 21 Lester Close Wattle Ponds
View Distance	3km
Character Zone	Character Zone 6
Visual Setting	Regional
Visual Modifications	The modifications are approximately 3km from the sensitive receiver in this location. The landscape transformations include significant stockpiling and stockpiling between the sensitive receiver and the larger hills in the far distance. The stockpiling does not substantially increase the height of the existing landforms however, it does move the higher landform closer to the viewpoint. The landform will consist of raw earth material however it will be revegetated on completion of the mining project.
Land Use	Agricultural
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – Moderate-low The proposed landscape modifications as a result of mining activity will move the higher landscape forms in the middle ground towards the sensitive receiver. The landscape modifications will be partially visible above the vegetation in the immediate vicinity of the sensitive receivers. Due to the significant amounts of vegetation in the locality of the sensitive receivers, the majority of the landscape modifications will not be visible from this receiver. The potential visual impact is considered reasonable from the sensitive receiver at Viewpoint 2.

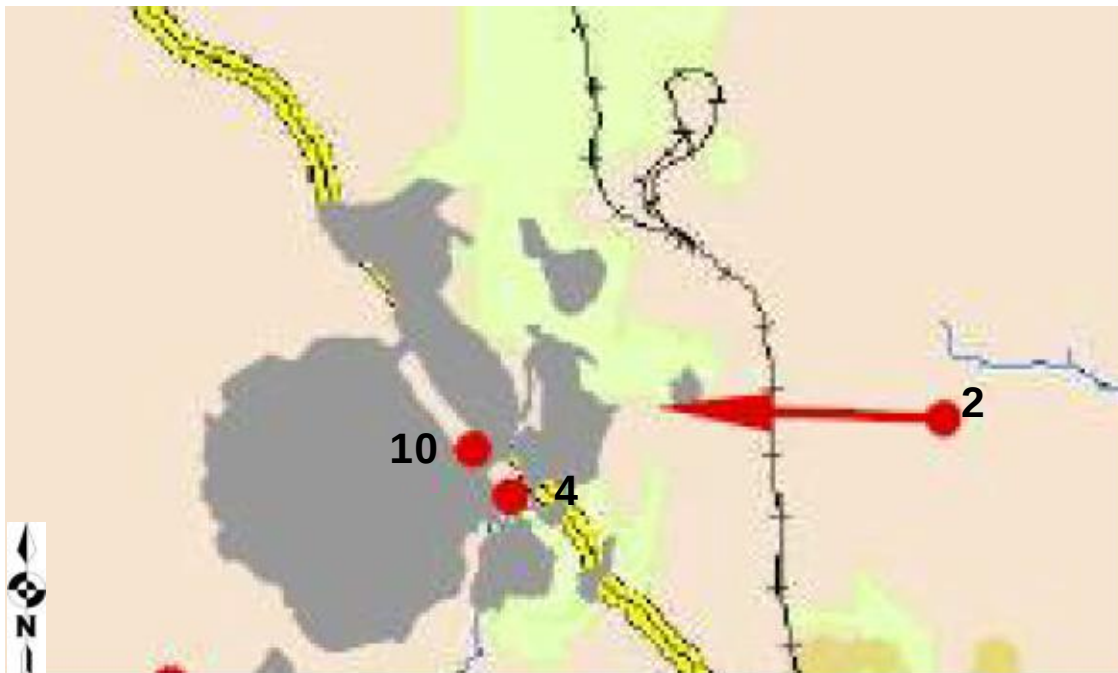


Figure 17 Viewpoint Direction

Source: RPS Australia East Pty Ltd 2014.

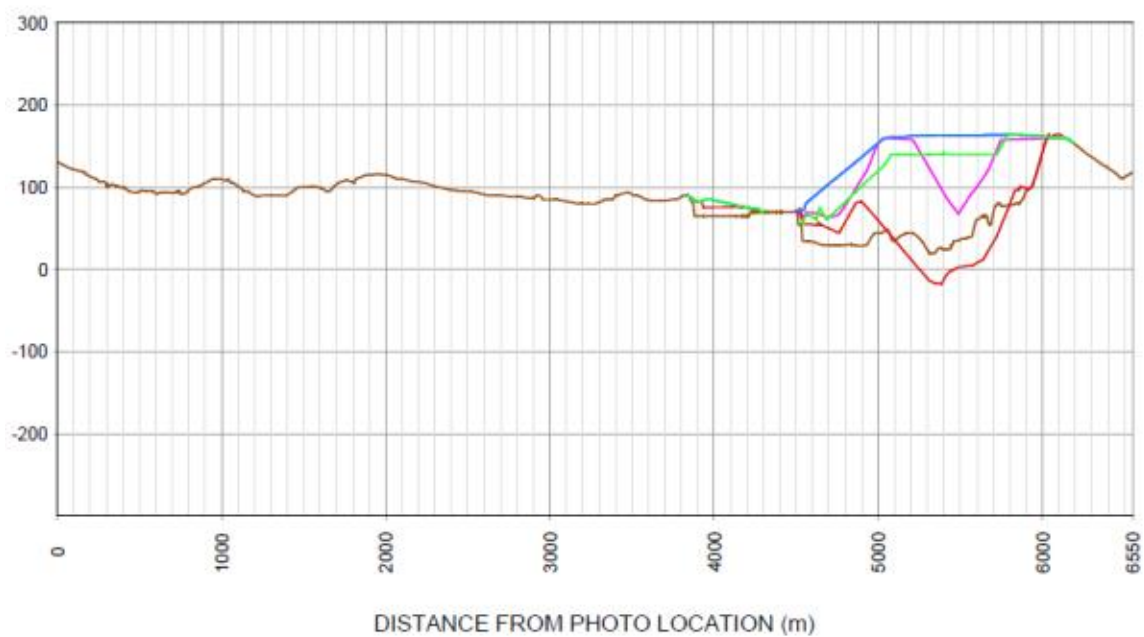


Figure 18 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 13 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 14 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 15 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 16 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 17 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 18 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 6 Viewpoint 3 – Hambledon Hill Lookout

Viewpoint 3 Hambledon Hill Lookout	
View Location	Hambledon Hill Lookout
View Distance	2.6km
Character Zone	Character Zone 7
Visual Setting	Sub-Regional
Visual Modifications	The visible modifications to the landscape as a result of the mining operations at the Rix's Creek Mine is primarily screened by the higher landscape form in between the sensitive receiver and the mining activity. Stockpiles will be visible from the sensitive receiver however, the stockpiles are not likely to have a major impact on the horizon line. The fill material will be visible from the sensitive receiver between the gaps in the existing vegetation. The uppermost portion of the new open cut mining activity will also be apparent from the sensitive receiver.
Land Use	Residential, Tourist and Local Roads.
Visual Sensitivity	Low due to distance and screening by vegetation.
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – Low The sensitive receivers will experience some change beyond the higher landscape form in the middle distance of the view to the north. The changes include removal of existing vegetation and the exposure of bare earth, spoil and fill material. The changes will not interrupt the existing horizon line and the existing vegetation in the immediate vicinity of the sensitive receiver acts as a screen to the majority of the landscape changes. The potential visual impact is considered reasonable from the sensitive receiver at Viewpoint 3.

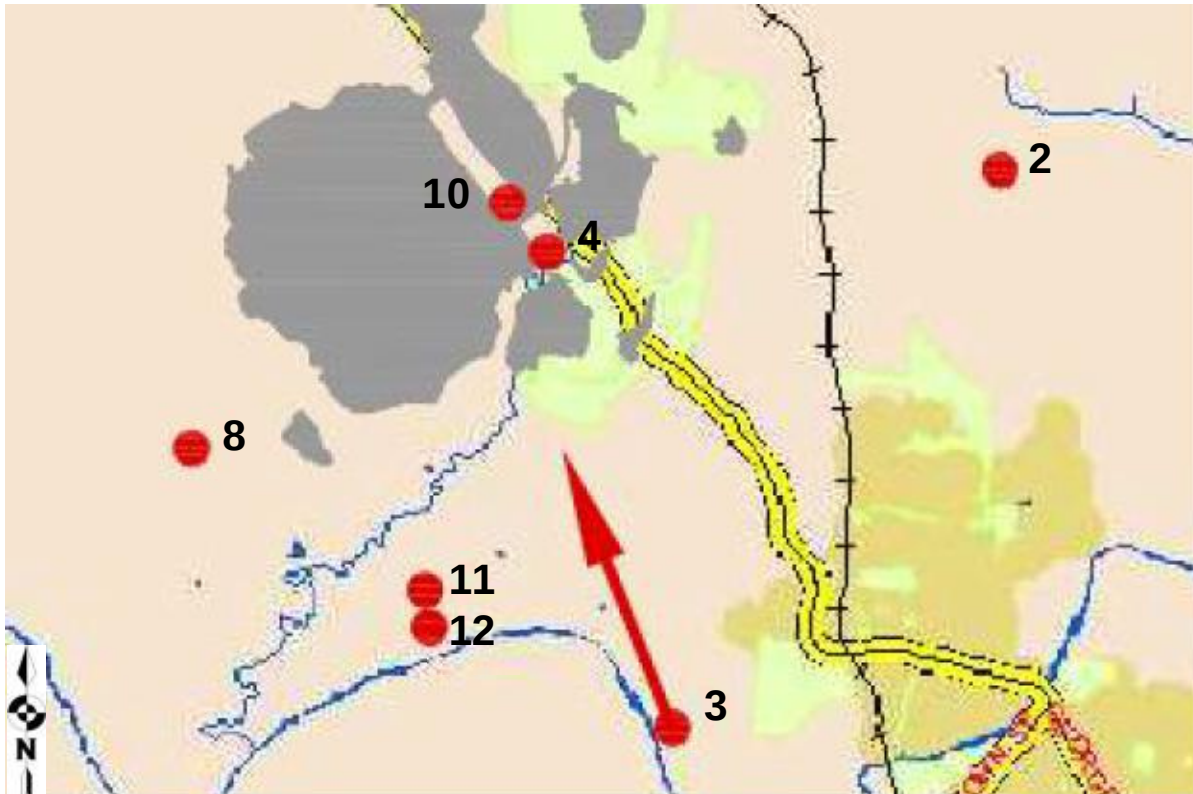


Figure 19 Viewpoint Direction

Source: RPS Australia East Pty Ltd 2014.

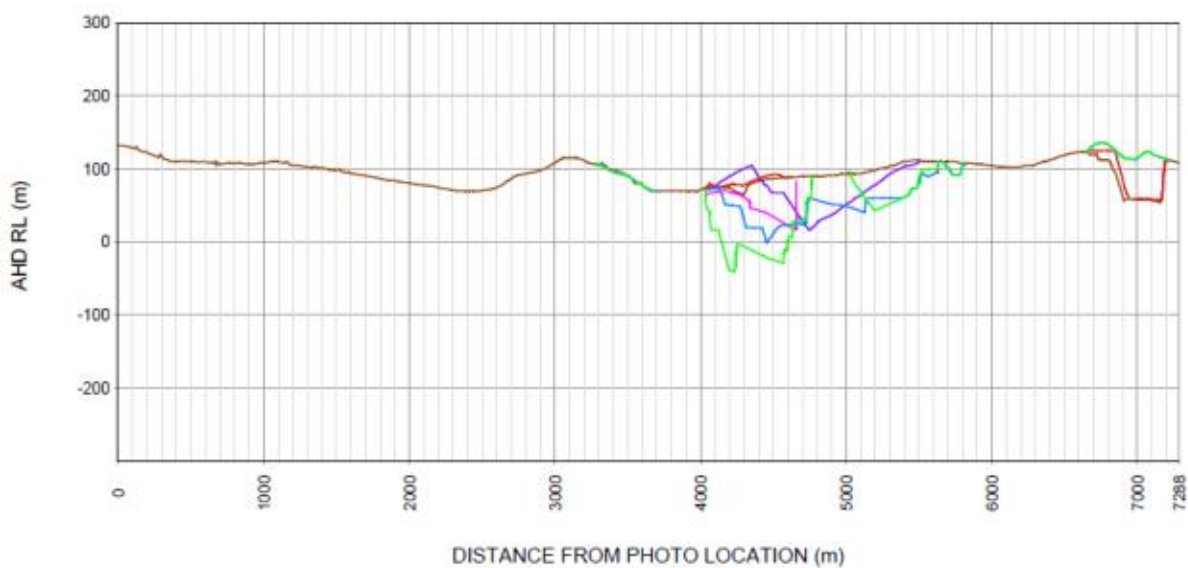


Figure 20 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 19 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 20 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 21 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 22 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 23 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 24 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 7 Viewpoint 4a – New England Highway 2

Viewpoint 4a – New England Highway 2	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	The mine is currently visible beyond the foreground hill. The landform then falls away before rising again to show the northern face of the hill in the background. The proposed mining activity will significantly increase the height of the stockpiling when viewed by road users of the New England Highway. The stockpile will continue to grow throughout the life of the mine until completion, when the mine is filled in and rehabilitated to match the existing vegetation.
Land Use	Highways/Tourist Routes
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – High Impact The mining activity will be highly visible from the mobile sensitive receivers along the New England Highway. The existing open cut mining operations immediately to the west of the viewpoint will be gradually filled to create a hill that will be visible by road users both travelling in the northerly and southerly directions. The hill will be visible above the existing landform and tree line and will raise the horizon line substantially. The new landform will consist of fill material and will be rehabilitated on completion of the mining project using endemic flora. While the stockpiling will increase the height of the local landform and raise the horizon line, no views currently exist beyond the extremities of the mining site and therefore, the hill does not further restrict views beyond the mining site. Mitigation measures are recommended to reduce the visual impact of the stockpiling of spoil material on the sensitive receivers using the New England Highway.

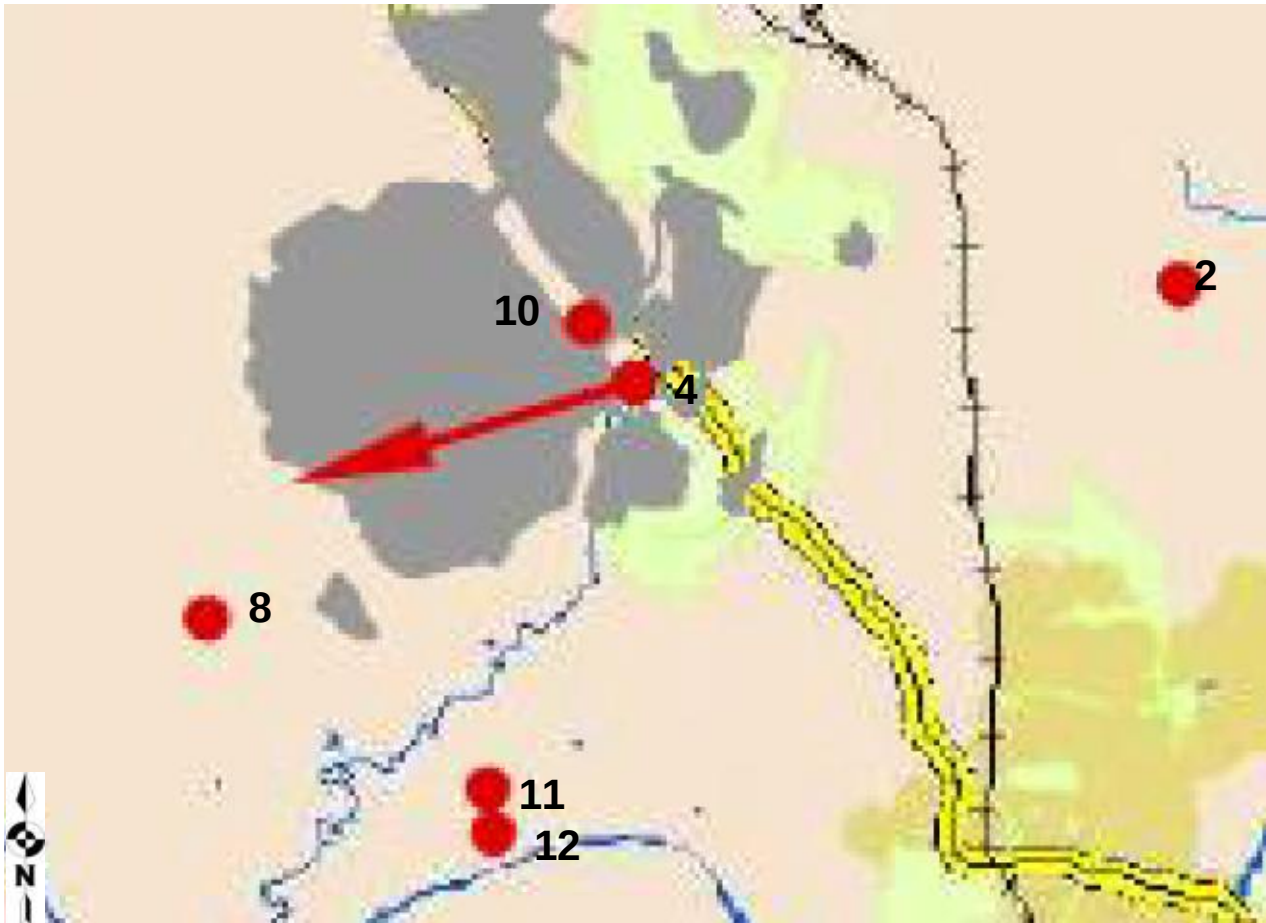


Figure 21 Viewpoint Direction
Source: RPS Australia East Pty Ltd 2014.

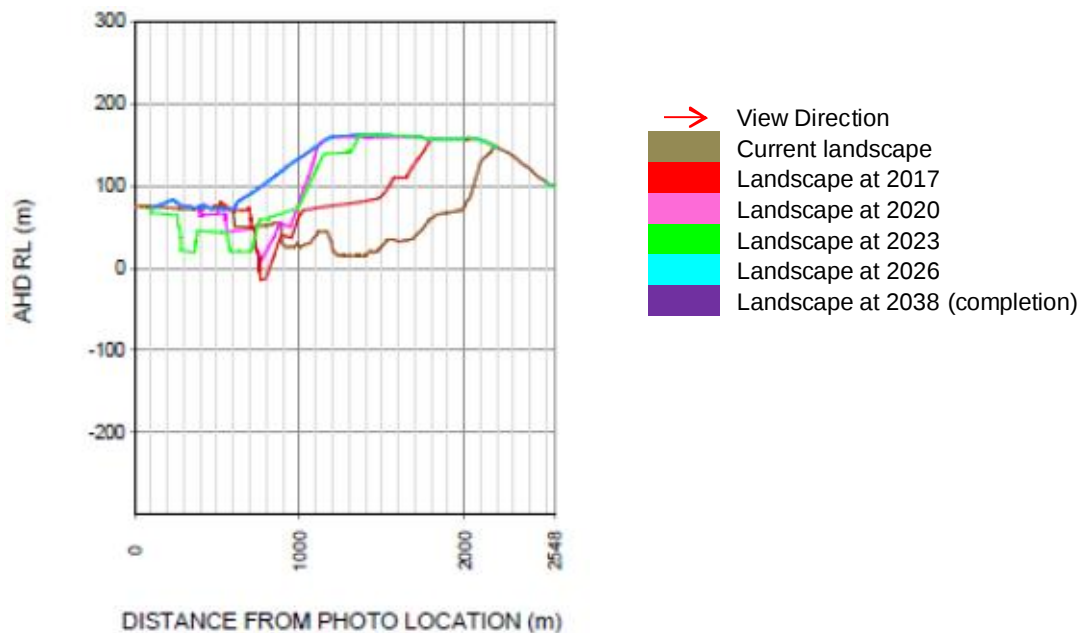


Figure 22 Cross section from viewpoint
Source: RPS Australia East Pty Ltd 2014.



Plate 25 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 26 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 27 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 28 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 29 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 30 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 8 Viewpoint 4b – New England Highway 2

Viewpoint 4b – New England Highway 2	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	The mine is currently visible beyond the foreground hill. The landform then falls away before rising again to show the northern face of the hill in the background. The proposed mining activity will significantly increase the height of the stockpiling when viewed by road users of the New England Highway. The stockpile will continue to grow throughout the life of the mine until completion, when the mine is filled in and rehabilitated to match the existing native vegetation.
Land Use	Highways/Tourist Routes
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – High Impact The mining activity will be highly visible from the mobile sensitive receivers along the New England Highway. The existing open cut mining operations immediately to the west of the viewpoint will be gradually filled to create a hill that will be visible by road users both travelling in the northerly and southerly directions. The hill will be visible above the existing landform and tree line and will raise the horizon line substantially. The new landform will consist of fill material and will be rehabilitated on completion of the mining project using endemic flora. While the stockpiling will increase the height of the local landform and raise the horizon line, no views currently exist beyond the extremities of the mining site and therefore, the hill does not further restrict views beyond the mining site. Mitigation measures are recommended to reduce the visual impact of the stockpiling of spoil material on the sensitive receivers using the New England Highway.

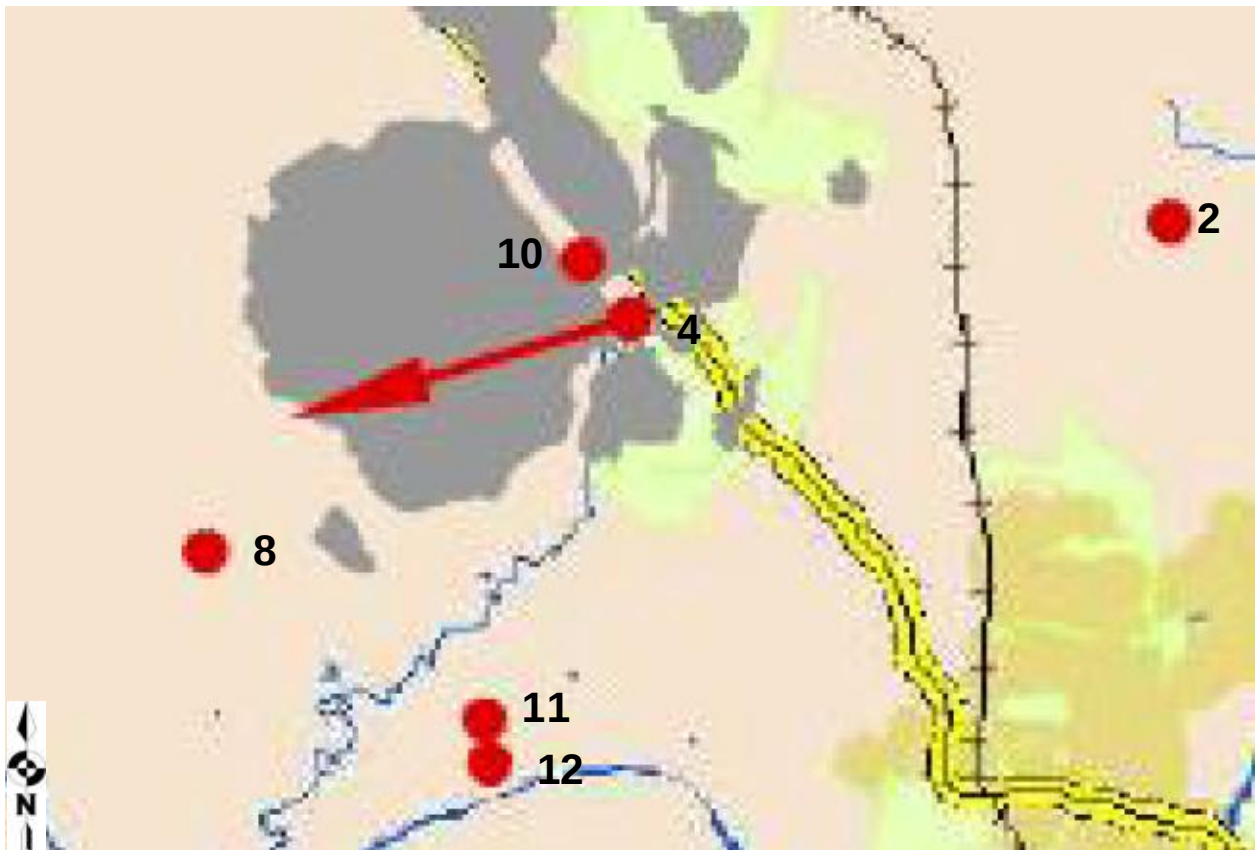


Figure 23 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

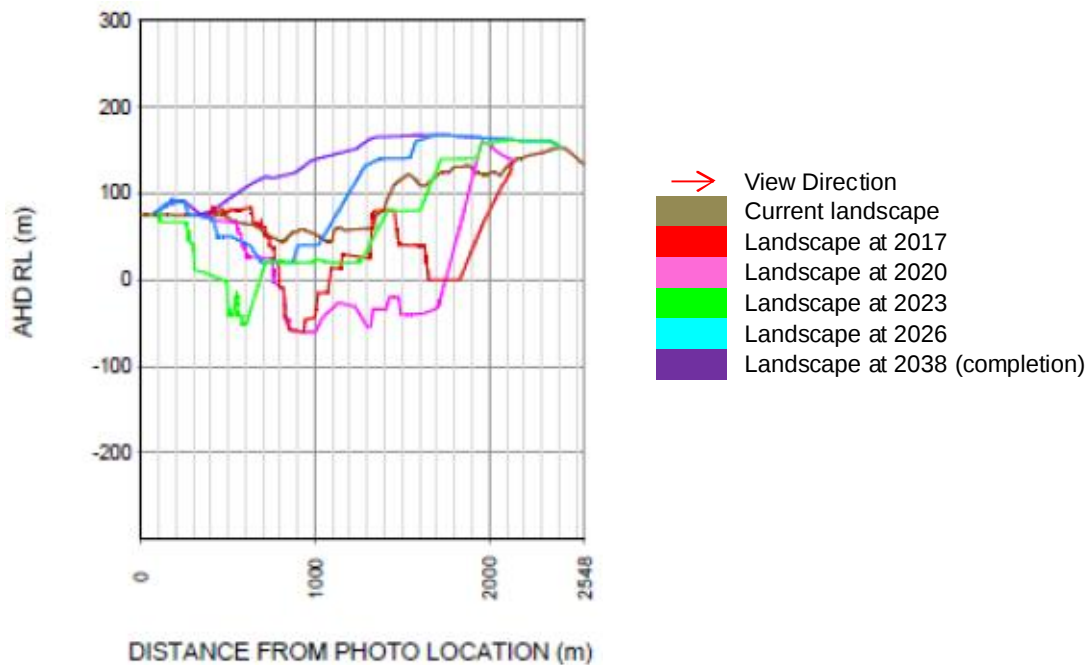


Figure 24 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 31 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 32 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 33 Field of view at 2020

Source: RPS Australia East Pty Ltd 2014.



Plate 34 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 35 Field of view at 2026

Source: RPS Australia East Pty Ltd 2014.



Plate 36 Field of view at 2038 (completion)

Source: RPS Australia East Pty Ltd 2014.

Table 9 Viewpoint 4c – New England Highway 2

Viewpoint 4c – New England Highway 2	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	Visual modifications include the gradual stockpiling of the mining lease area to the east of the Highway which is partially visible when travelling at speed along the Highway. The stockpiling will result in a slow return of the landscape to a semi natural state which will be seen through the combination of small gaps in the vegetation. A new bridge will be visible to the north of the viewpoint as a result of the proposed haul road under the Highway. The new haul road will result in a modified landscape and clearing of vegetation in the immediate vicinity of the Highway. The modified landscape is proposed to be rehabilitated.
Land Use	Highways/Tourist Routes
Visual Sensitivity	Moderate due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – Moderate-Low The view north along the New England Highway will experience minor change from this viewpoint. The existing bunding and vegetation will screen the majority of the landscape modifications to the east of the Highway. The ongoing stockpiling of the existing open cut mine to the east of the Highway will gradually improve scale of the elevation changes within the locality until such time as the mine is returned to a semi natural landform and is rehabilitated. The visual modifications to the east of the Highway are considered to improve the visual amenity of the locality over time. The new haul road to the north of the viewpoint will result in the removal of existing screening vegetation and a significant change in landscape that will only be momentarily noticeable for traffic passing through the site at speed. The change in visual character of the locality is highly localised and is not considered to significantly impact on the visual character experienced by the sensitive receivers. The potential visual impact is considered reasonable from the sensitive receiver at Viewpoint 3.

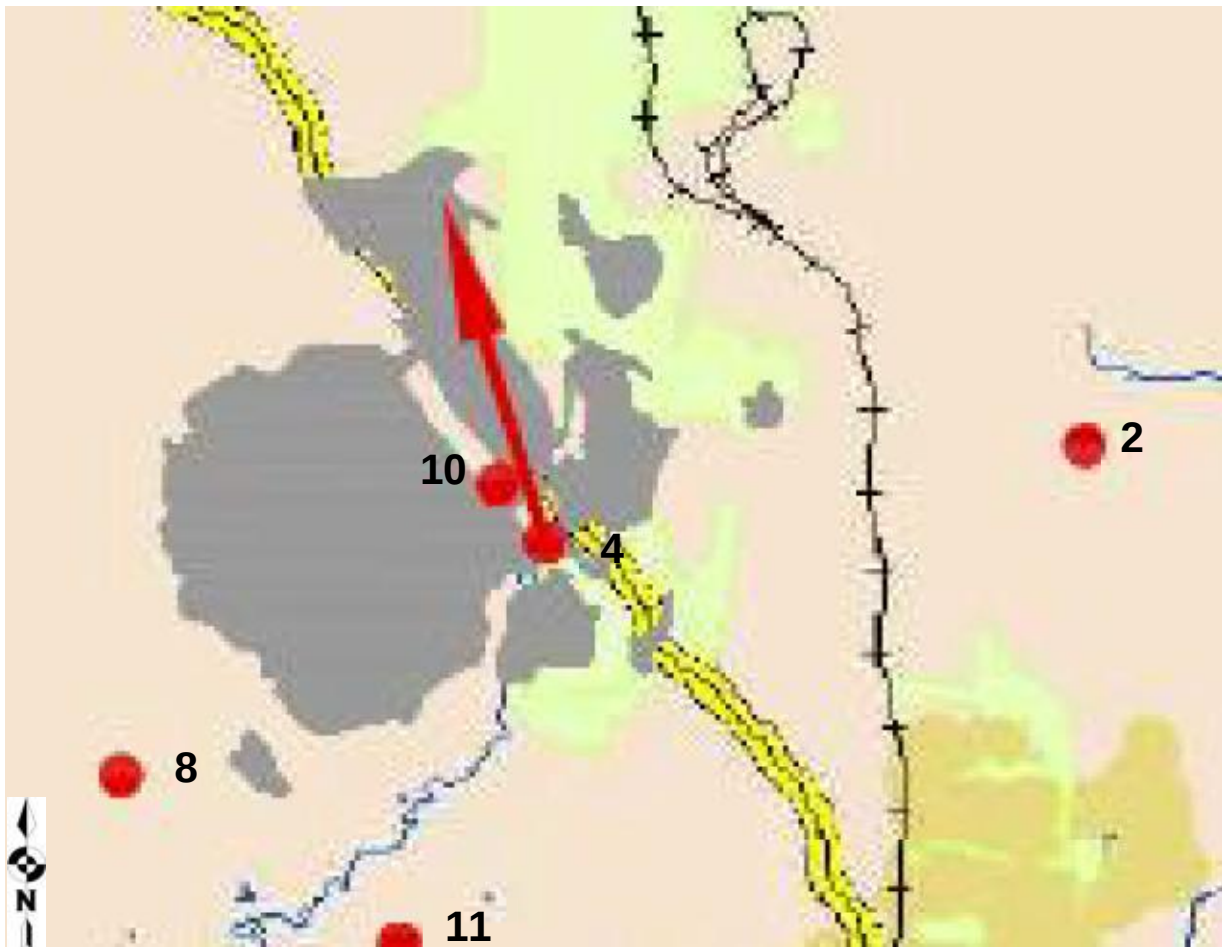


Figure 25 Viewpoint locations
Source: RPS Australia East Pty Ltd 2014.

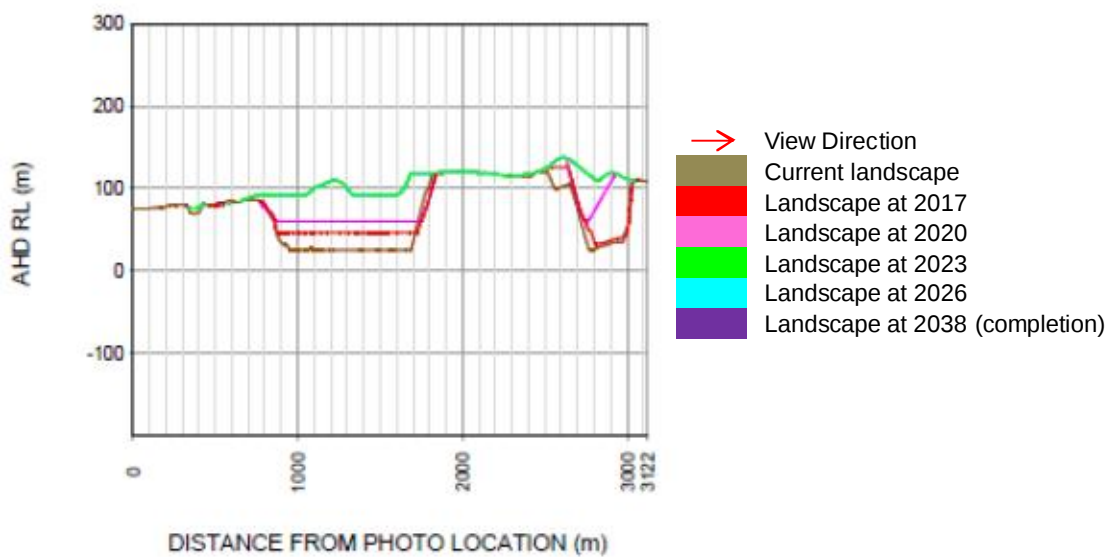


Figure 26 Cross section from viewpoint
Source: RPS Australia East Pty Ltd 2014.



Plate 37 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 38 Field of view at 2017 (outline showing extent of works out of view)
Source: RPS Australia East Pty Ltd 2014.



Plate 39 Field of view at 2020 (outline showing extent of works out of view)

Source: RPS Australia East Pty Ltd 2014.



Plate 40 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 41 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 42 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 10 Viewpoint 5 – New England Highway, Wittingham

Viewpoint 5 – New England Highway, Wittingham	
View Location	New England Highway south of Wittingham
View Distance	10km
Character Zone	Character Zone 2
Visual Setting	Regional
Visual Modifications	Modifications to the landscape within the field of view from the sensitive receiver include the exposure of raw earth material or spoil in the far distance.
Land Use	Highway
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – Low The potential landscape modifications are in excess of 10km from the sensitive receiver. The mobile nature of the sensitive receiver results in the small magnitude of the modifications having little to negligible impacts on the field of vision. The potential visual impact will include some clearing of vegetation and slight modification to the landform however, this modification will not impact on the horizon nor will it have a significant impact on the visual character of the locality when viewed from this distance from the mine. The landscape will be returned to a rehabilitated natural state on the completion of the mining project. The potential visual impact is considered reasonable from the sensitive receiver at Viewpoint 5.

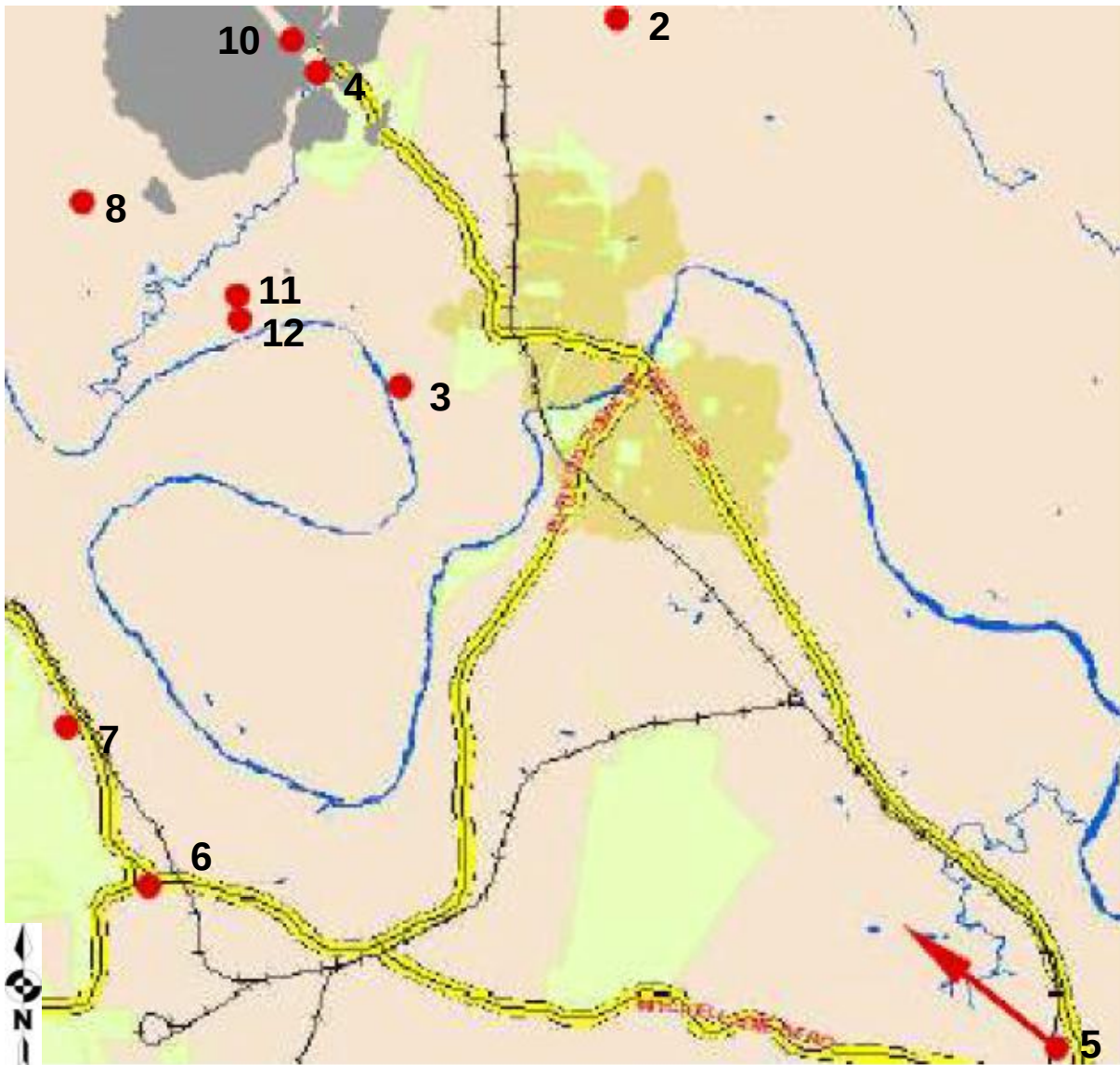


Figure 27 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

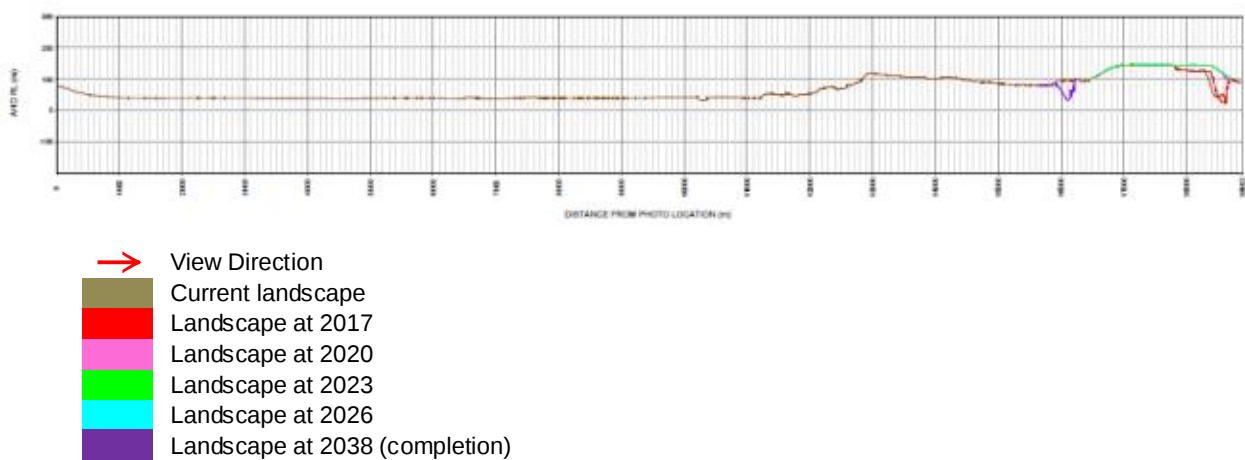


Figure 28 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 43 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 44 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 45 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 46 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 47 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 48 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 11 Viewpoint 6 – Golden Highway, Mount Thorley

Viewpoint 6 – Golden Highway, Mount Thorley	
View Location	Golden Highway, Mount Thorley
View Distance	9km
Character Zone	Character Zone 3
Visual Setting	Regional
Visual Modifications	Stockpiling and stockpiling of spoil will be visible from the sensitive receiver. The rise in the landform on the northern side of the Hunter River flood plain will be increased as a result of stockpiling over the course of the mining operations. The stockpiling will increase the height of the existing rise in the landform in this location by approximately 100%. This stockpiling will occur as fill into the existing open cut mine.
Land Use	Highway
Visual Sensitivity	Low due to distance.
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – Moderate The visual impacts of the proposed mining operations include modifications to the horizon as a result of stockpiling spoil from the mining operations on other parts of the mine site. The horizon line will be lifted but not above the current highest landform. The overall impact will be a flattening of the horizon line. The new works will appear as bare earth with light groundcovers occupying the external slopes until such time as the mining operations are complete and full rehabilitation can take place. While the horizon will be modified, the extent of the impact of the landscape variation on the view from the sensitive receiver will be relatively low in the overall context of the view. The potential visual impacts from this sensitive receiver are considered acceptable.

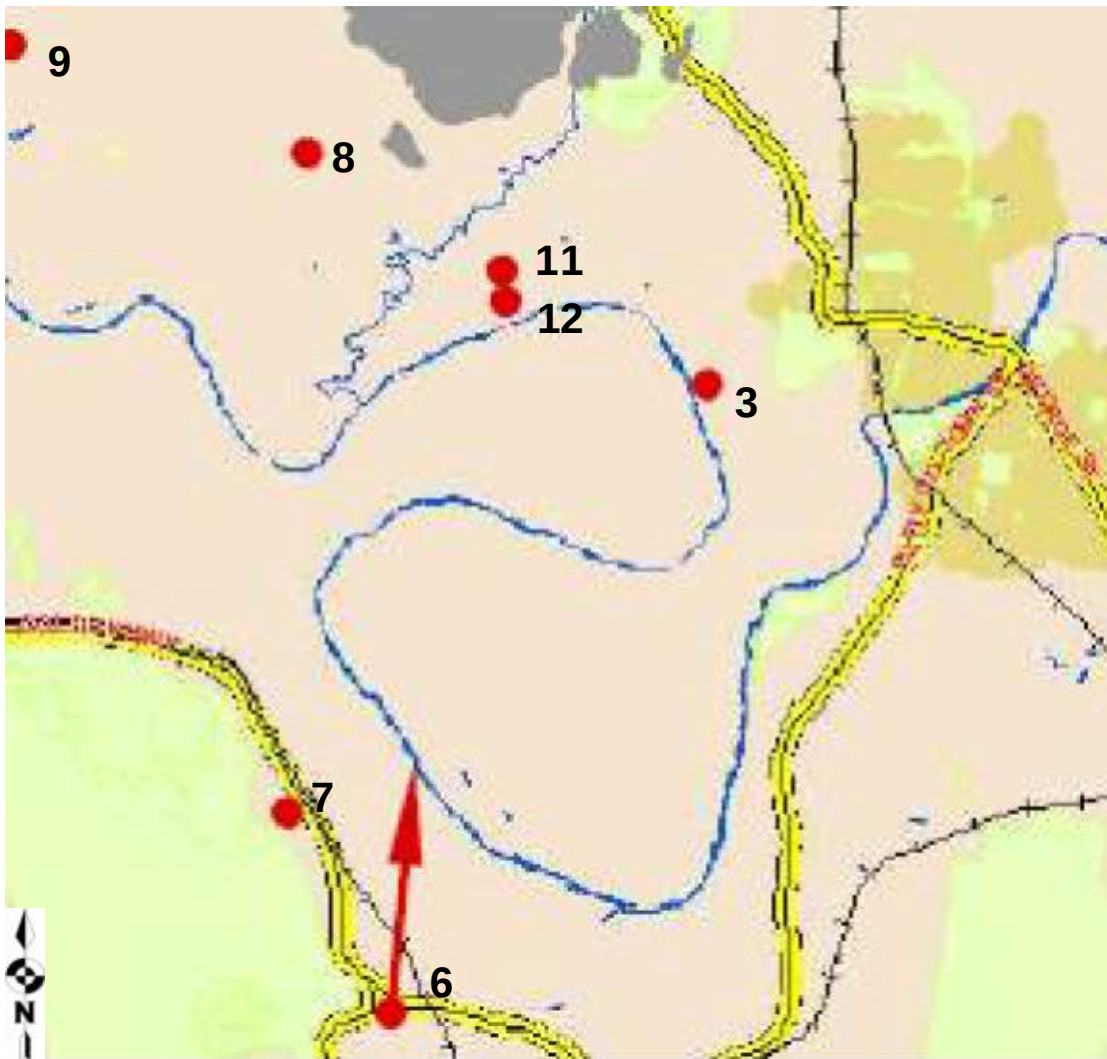


Figure 29 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.



Figure 30 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 49 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 50 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 51 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 52 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 53 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 54 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 12 Viewpoint 7 – Golden Highway, Jerrys Plains

Viewpoint 7 – Golden Highway, Jerrys Plains	
View Location	Golden Highway, Jerrys Plains
View Distance	10km
Character Zone	Character Zone 3
Visual Setting	Regional
Visual Modifications	Stockpiling and stockpiling of spoil will be visible from the sensitive receiver. The rise in the landform on the northern side of the Hunter River flood plain will be gradually cut and filled over the lifecycle of the mining activity as proposed in the current application.
Land Use	Highways/Tourist Routes and Agricultural
Visual Sensitivity	Low due to distance.
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – The visual impacts of the proposed mining operations include modifications to the horizon as a result of stockpiling spoil from the mining operations on other parts of the mine site. The horizon line will be lifted slightly above the current highest landform. The overall impact will be a flattening of the horizon line. The increasing of the height of the landform in the locality will extenuate the floodplain between the sensitive receiver and the mine site. The new works will appear as bare earth with light groundcovers occupying the external slopes until such time as the mining operations are complete and full rehabilitation can take place. While the horizon will be modified, the extent of the impact of the landscape variation on the view from the sensitive receiver will be relatively low in the overall context of the view. The potential visual impacts from this sensitive receiver are considered acceptable.

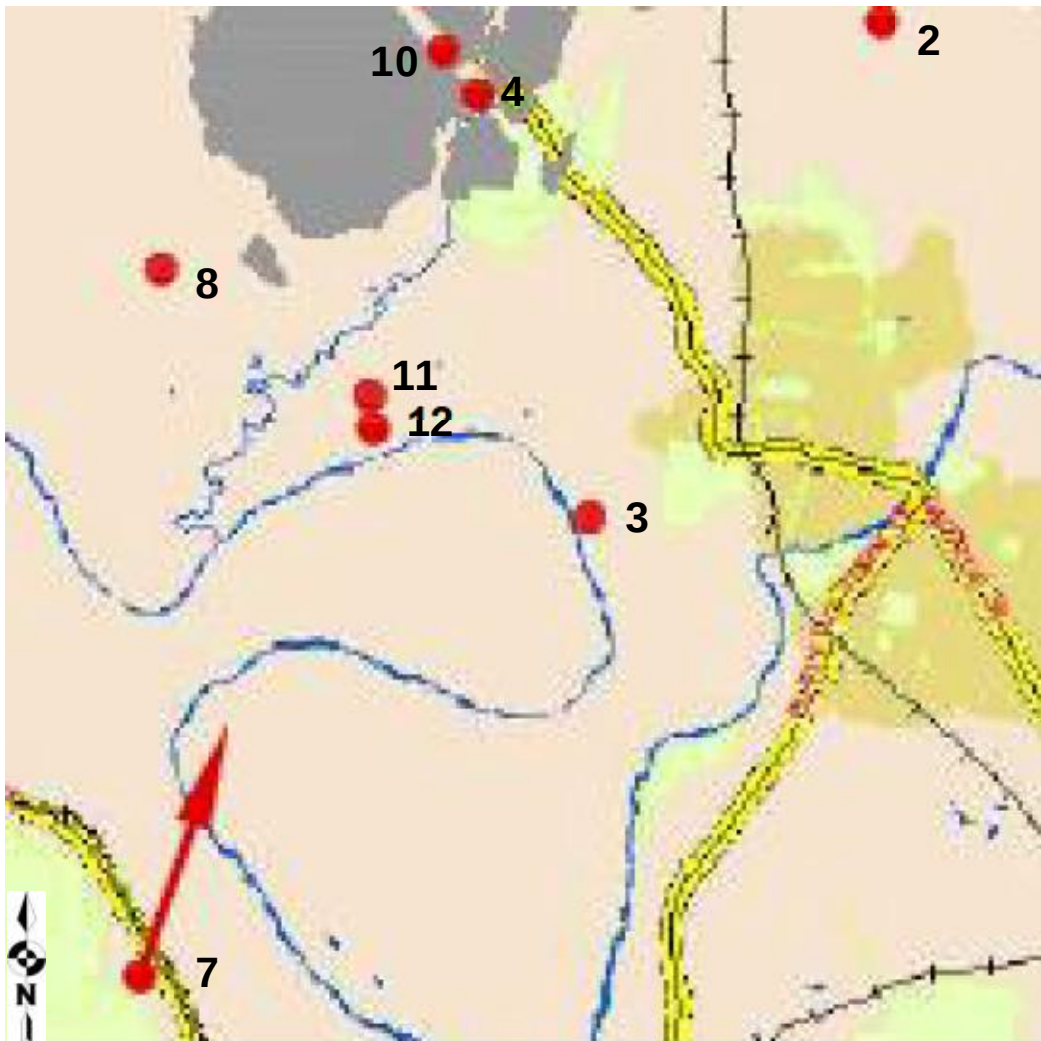


Figure 31 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

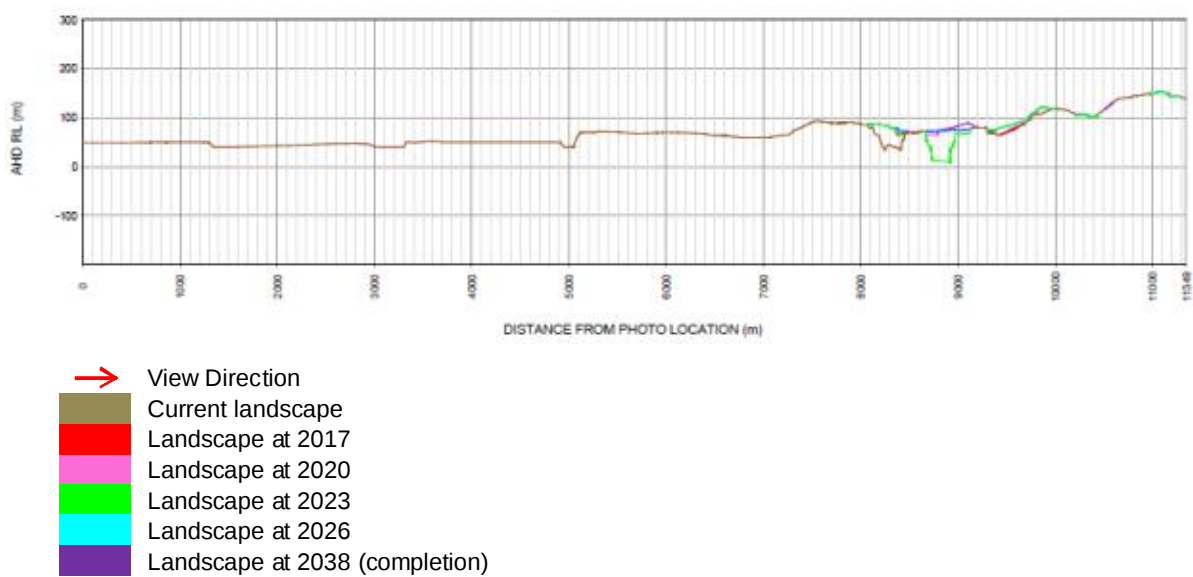


Figure 32 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 55 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 56 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 57 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 58 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 59 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 60 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 13 Viewpoint 8a – Maison Dieu

Viewpoint 8a – Mason Dieu	
View Location	Maison Dieu Road, Ridgeline, Maison Dieu
View Distance	1.6km
Character Zone	Character Zone 4
Visual Setting	Regional
Visual Modifications	The proposed mining activity will occur on the opposite side of the ridgeline of the foreground hills and will therefore be primarily screened from the sensitive receiver by the existing foreground landform. A small amount of stockpiling may be visible between the low points in the existing landform from Year 23 of operation.
Land Use	Agricultural
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – Low The modifications to the landscape will primarily be screened from the visual receiver by the existing landforms. A small sliver of stockpiling may be visible from Year 23 of operation however this stockpiling is generally below the existing landform and vegetation and unlikely to result in any significant impact on the visual characteristics of the view. The potential visual impacts are considered to be acceptable in this location.

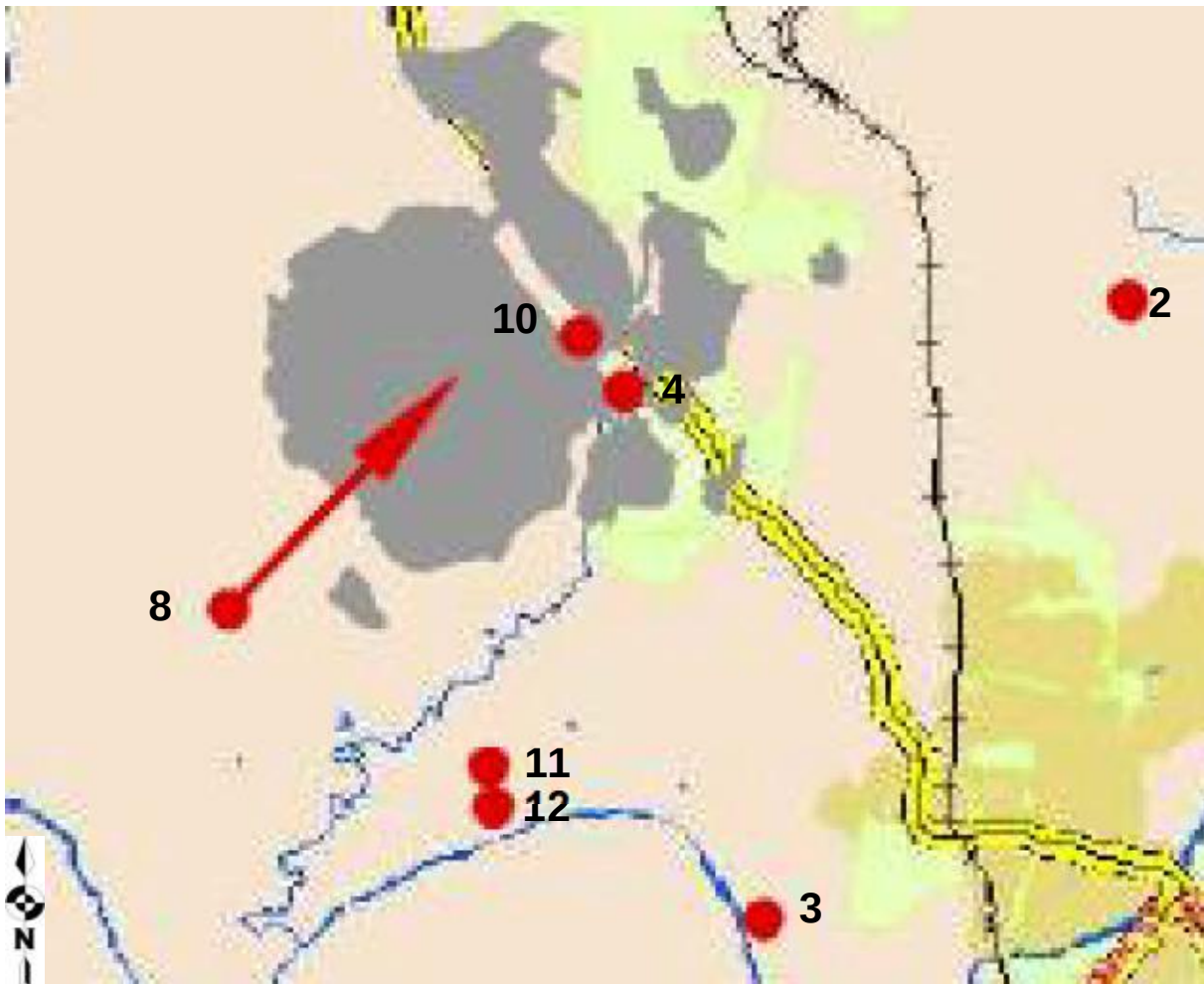


Figure 33 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

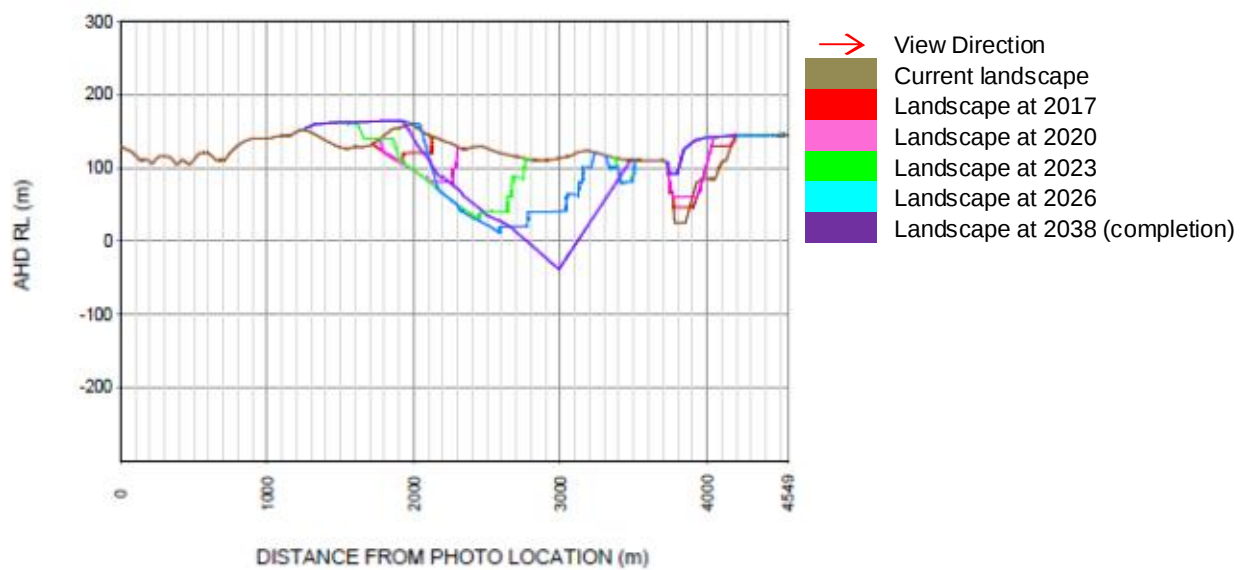


Figure 34 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 61 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 62 Field of view at 2017 (outline showing extent of work out of view)
Source: RPS Australia East Pty Ltd 2014.



Plate 63 Field of view at 2020 (outline showing extent of work out of view)

Source: RPS Australia East Pty Ltd 2014.



Plate 64 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 65 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 66 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 14 Viewpoint 8b – Maison Dieu

Viewpoint 8b – Mason Dieu	
View Location	Maison Dieu Road, Ridgeline, Maison Dieu
View Distance	1.6km
Character Zone	Character Zone 4
Visual Setting	Regional
Visual Modifications	The proposed mining activity will occur on the opposite side of the ridgeline of the foreground hills and will therefore be primarily screen from the sensitive receiver by the exiting foreground landform. A small amount of stockpiling may be visible between the low points in the existing landform from Year 23 of operation.
Land Use	Agricultural
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – Low The modifications to the landscape will be primarily screened from the visual received by the existing landforms. A small sliver of stockpiling may be visible from Year 23 of operation however this stockpiling is generally below the existing landform and vegetation and unlikely to result in any significant impact on the visual characteristics of the view. The potential visual impacts are considered to be acceptable in this location.

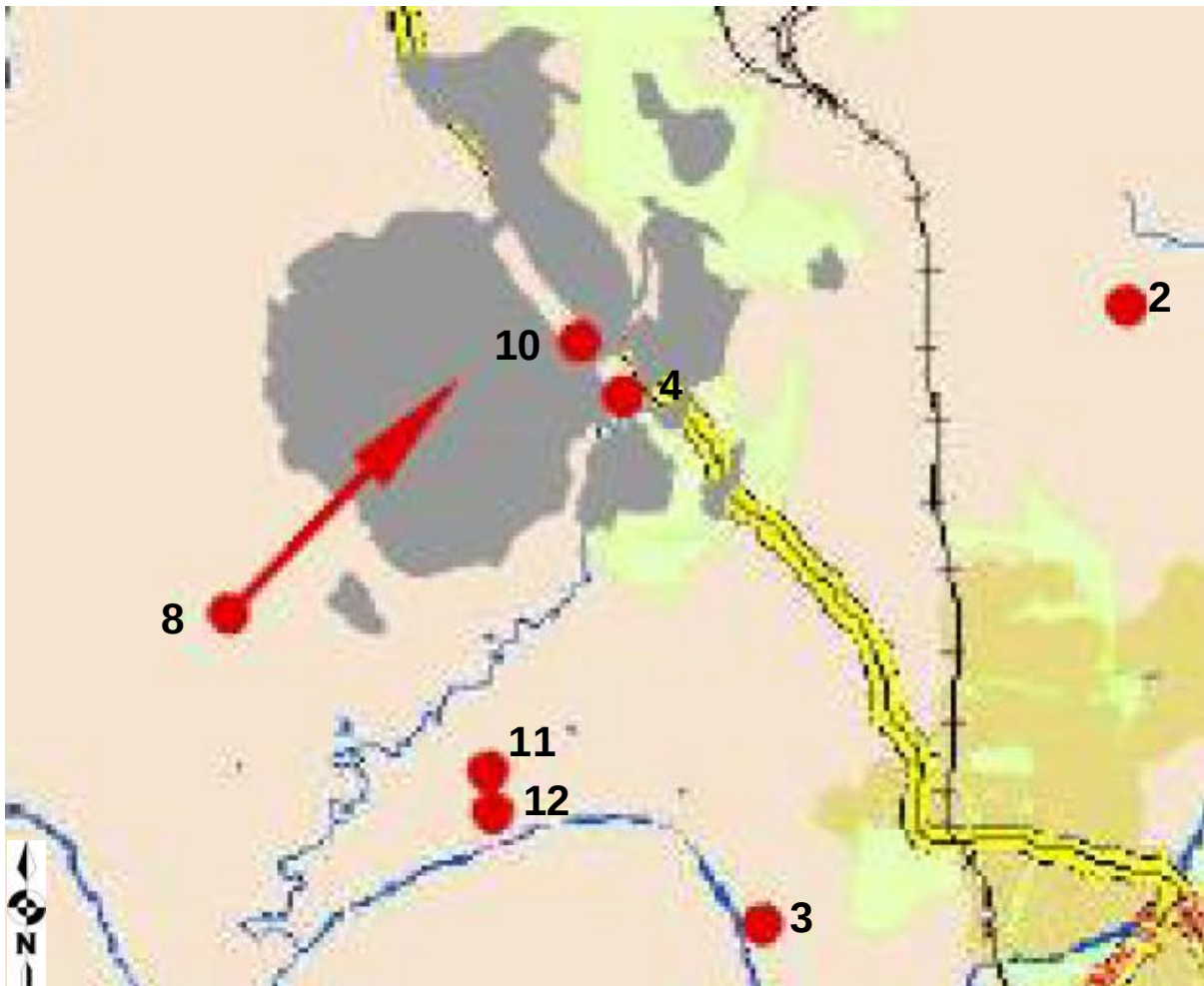


Figure 35 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

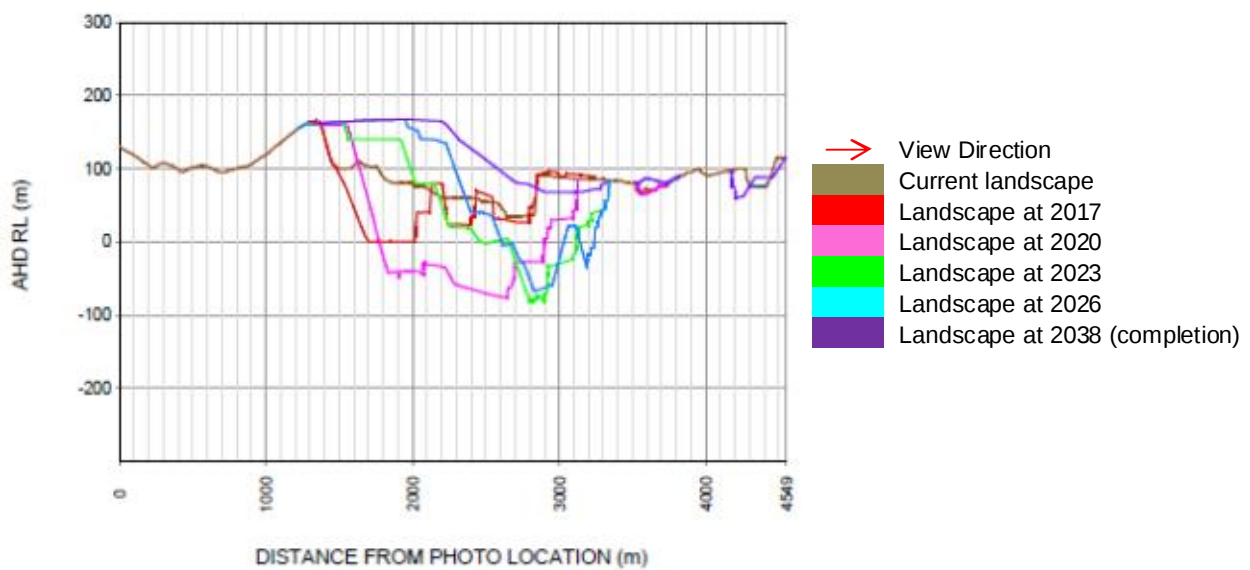


Figure 36 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 67 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 68 Field of view at 2017 (outline showing extent of work out of view)
Source: RPS Australia East Pty Ltd 2014.



Plate 69 Field of view at 2020 (outline showing extent of work out of view)

Source: RPS Australia East Pty Ltd 2014.



Plate 70 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 71 Field of view at 2026

Source: RPS Australia East Pty Ltd 2014.

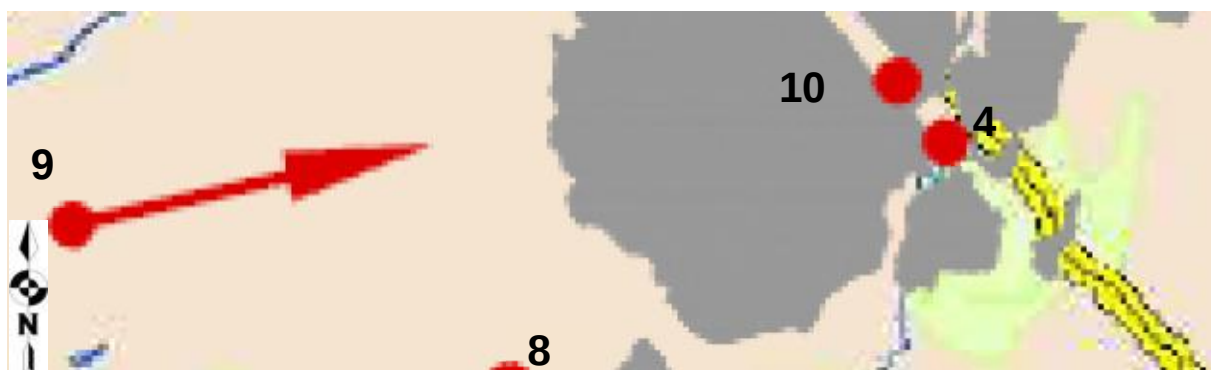


Plate 72 Field of view at 2038 (completion)

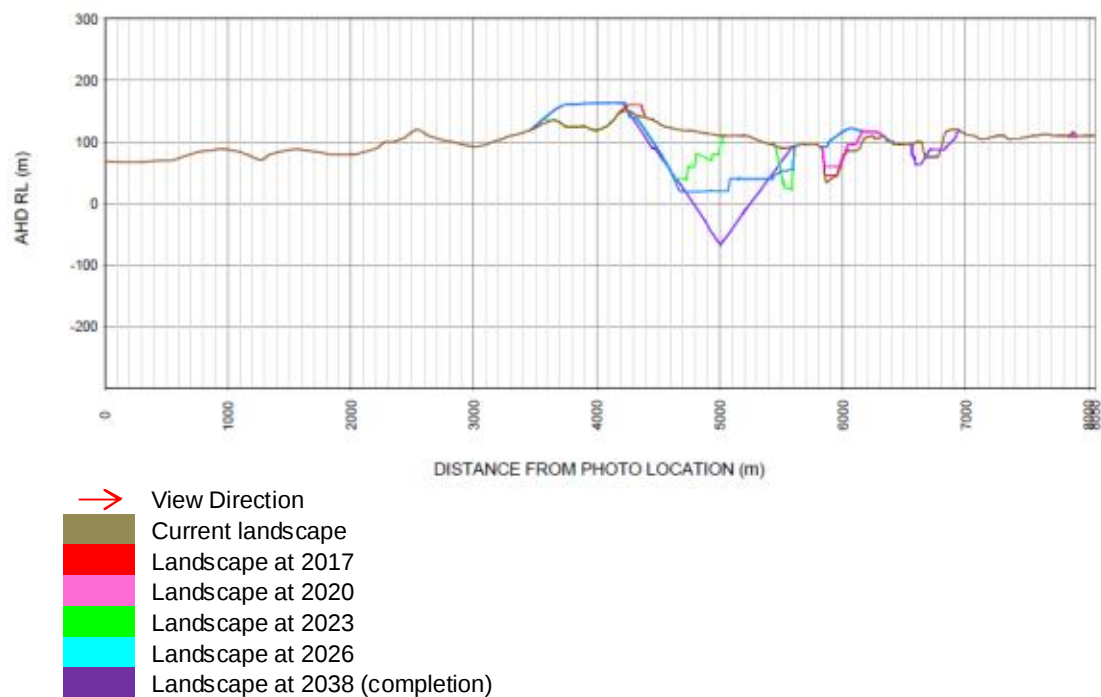
Source: RPS Australia East Pty Ltd 2014.

Table 15 Viewpoint 9 – Maison Dieu Residential

Viewpoint 9 – Mason Dieu Residential	
View Location	Maison Dieu Road, Ridgeline, Maison Dieu
View Distance	1.6km
Character Zone	Character Zone 4
Visual Setting	Sub-Regional
Visual Modifications	No visual modifications are apparent from the sensitive receiver at Viewpoint 9. Existing landform and vegetation screen the mining operations from the view achieved in this location.
Land Use	Agricultural
Visual Sensitivity	Low due to distance and screening by landform.
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – Negligible No visual impacts are recorded from the sensitive receiver located at viewpoint 9.

**Figure 37 Viewpoint locations**

Source: RPS Australia East Pty Ltd 2014.

**Figure 38 Cross section from viewpoint**

Source: RPS Australia East Pty Ltd 2014.



Plate 73 Current field of view (outline showing extent of works out of view)

Source: RPS Australia East Pty Ltd 2014.



Plate 74 Field of view at 2017 (outline showing extent of work out of view)

Source: RPS Australia East Pty Ltd 2014.



Plate 75 Field of view at 2020 (outline showing extent of work out of view)

Source: RPS Australia East Pty Ltd 2014.



Plate 76 Field of view at 2038 (completion) (outline showing extent of work out of view)

Source: RPS Australia East Pty Ltd 2014.

Table 16 Viewpoint 10a – New England Highway 3

Viewpoint 10a – New England Highway 3	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	Modifications on the western side of the New England Highway will be visible from the sensitive receivers utilising the Highway thoroughfare. Landscape modifications that will result in modifications to the visual landscape will include the continued mining of the land in the immediate vicinity of the Highway. Once the mining operations in this location are completed the areas will be utilised for stockpiling of spoil. The stockpiling will result in a new raised landform in the foreground which is proposed to mimic the existing height of the surrounding landforms. The new landform will represent a semi natural, gradually sloping hill in keeping with the physical landscape characteristics in the locality.
Land Use	Highways/Tourist Routes
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – High The modifications to the landscape in the immediate vicinity of the New England Highway will significantly alter the visual characteristics of the view currently seen by the sensitive receivers utilising the New England Highway. The view will change from an active mine site to a building stockpile of spoil material. The spoil material is proposed to be stockpiled so as to represent natural landform. The stockpiling will not be completed until the completion of the proposed mining project and therefore the stockpile will appear as spoil or bare earth for the full lifetime of the project. On completion of the proposed mining operations the stockpiling can be rehabilitated. The delay in rehabilitation will result in a prominent unnatural appearing landform in close proximity to the New England Highway for the period of operation of the mine. On completion of the mining project the landform will be rehabilitated and at this stage the stockpiles will appear as natural vegetated areas when viewed from the New England Highway. The visual impact on the view of the sensitive receivers utilising the New England Highway will be high, however the landscape on completion of the mining project will appear semi natural. Mitigation measures are recommended to reduce the potential visual impact of the stockpiling on the views of the sensitive receivers using the New England Highway.

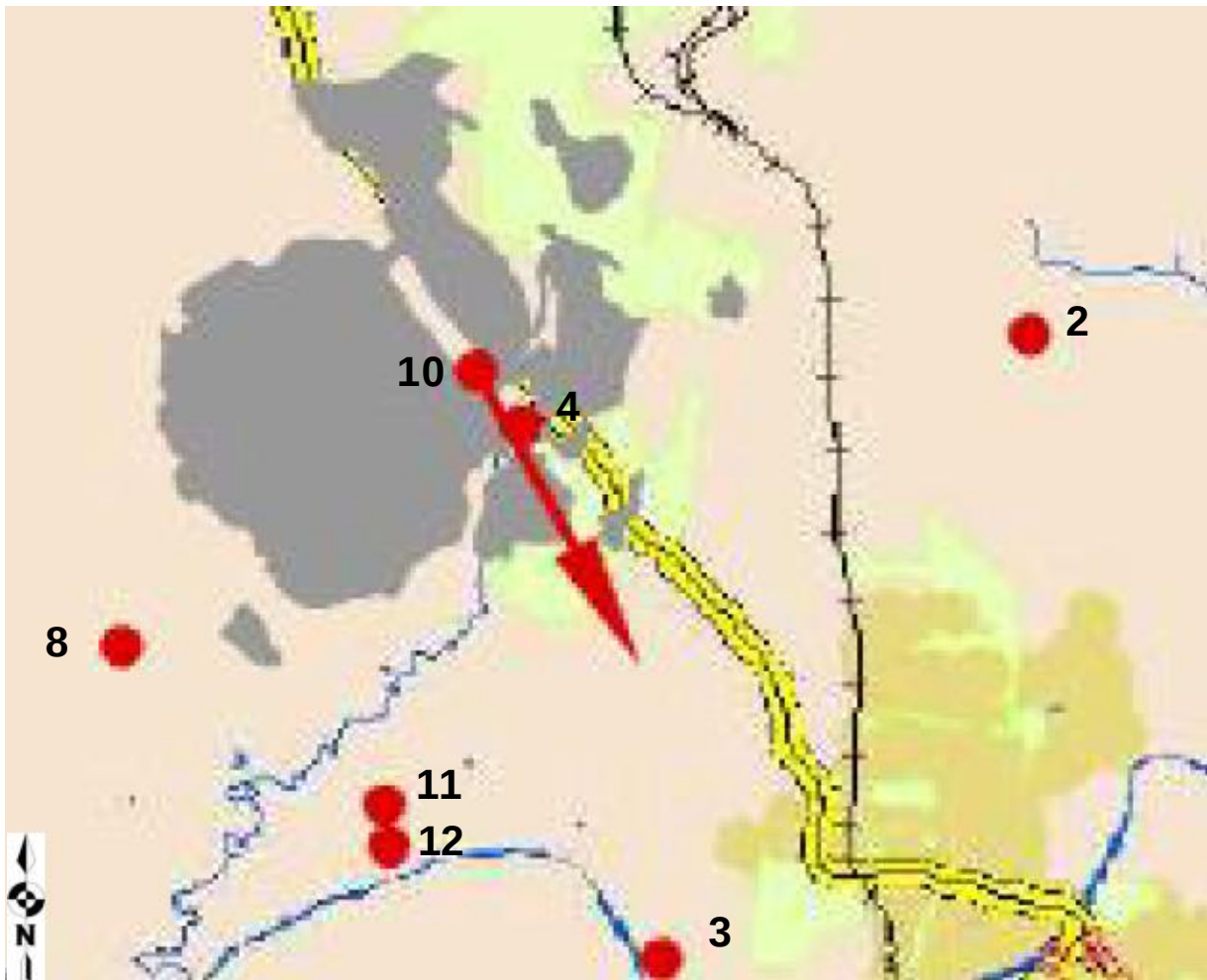


Figure 39 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

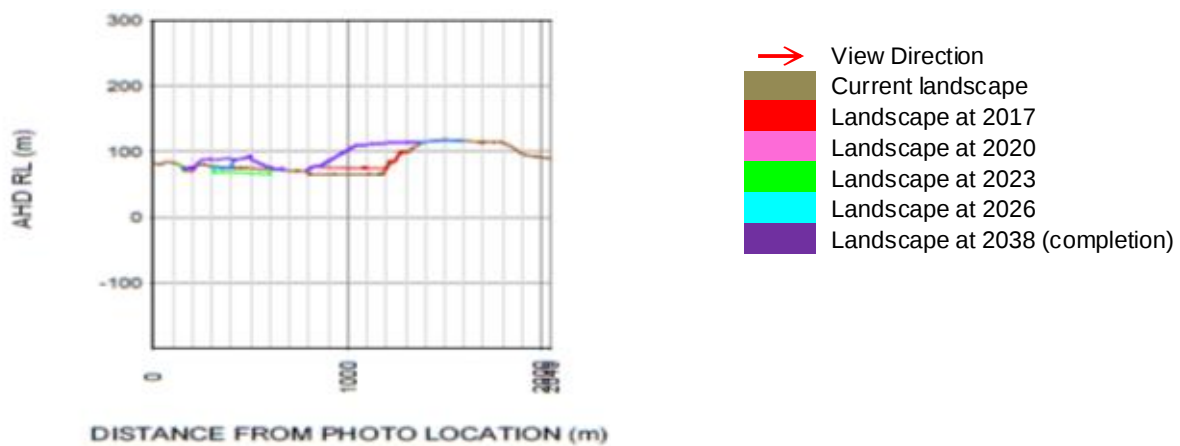


Figure 40 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 77 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 78 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 79 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 80 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 81 Field of view at 2026

Source: RPS Australia East Pty Ltd 2014.



Plate 82 Field of view at 2038 (completion)

Source: RPS Australia East Pty Ltd 2014.

Table 17 Viewpoint 10b – New England Highway 3

Viewpoint 10b – New England Highway 3	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	The existing bunding in the foreground will shield/screen the majority of the mining activity. Stockpiling will be built up beyond the height of the bunding into the view of the sensitive receivers. The proposed stockpiling will significantly alter the existing horizon with stockpiling activities proposed to continue throughout the operational life of the proposed mining activities.
Land Use	Highways/Tourist Routes
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – High The proposed mining operations will result in new stockpiling becoming visible to the sensitive receivers beyond the existing bunding. The existing bunding screens the current extent of the mining activity from the view of the sensitive receivers using the New England Highway. The new stockpiling will appear above the height of the existing bunding into the line of sight of the sensitive receivers and will present as unnatural stockpiles of dirt, rock and spoil. As the stockpiling is proposed to continue up until the completion of the proposed mining activity, the stockpile will remain unvegetated for the life of the proposed mining operation. The stockpiling is proposed to be rehabilitated with endemic flora on completion of the mining project and only at that stage will the landform begin to represent a natural state within the line of sight of the sensitive receivers. Mitigation measures are recommended to reduce the potential visual impact of the stockpiling on the views of the sensitive receivers using the New England Highway.

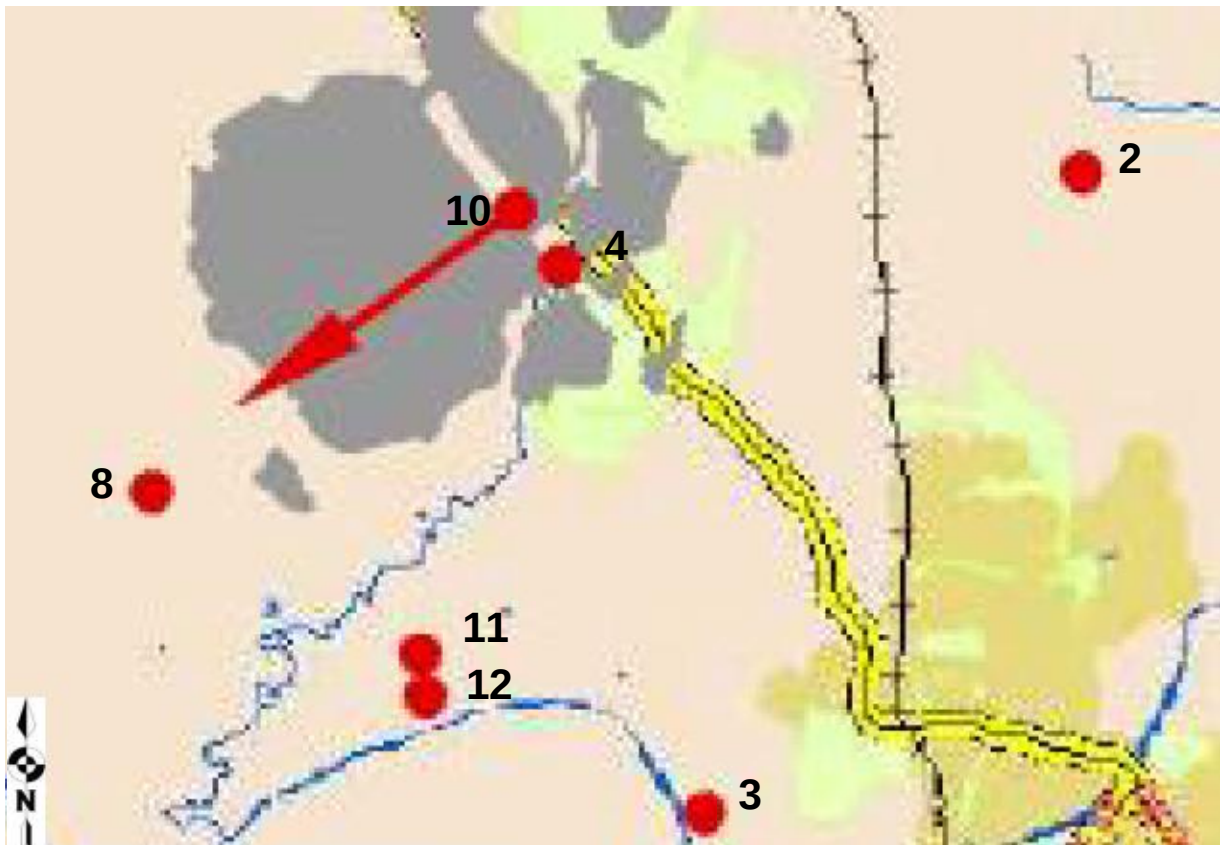


Figure 41 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

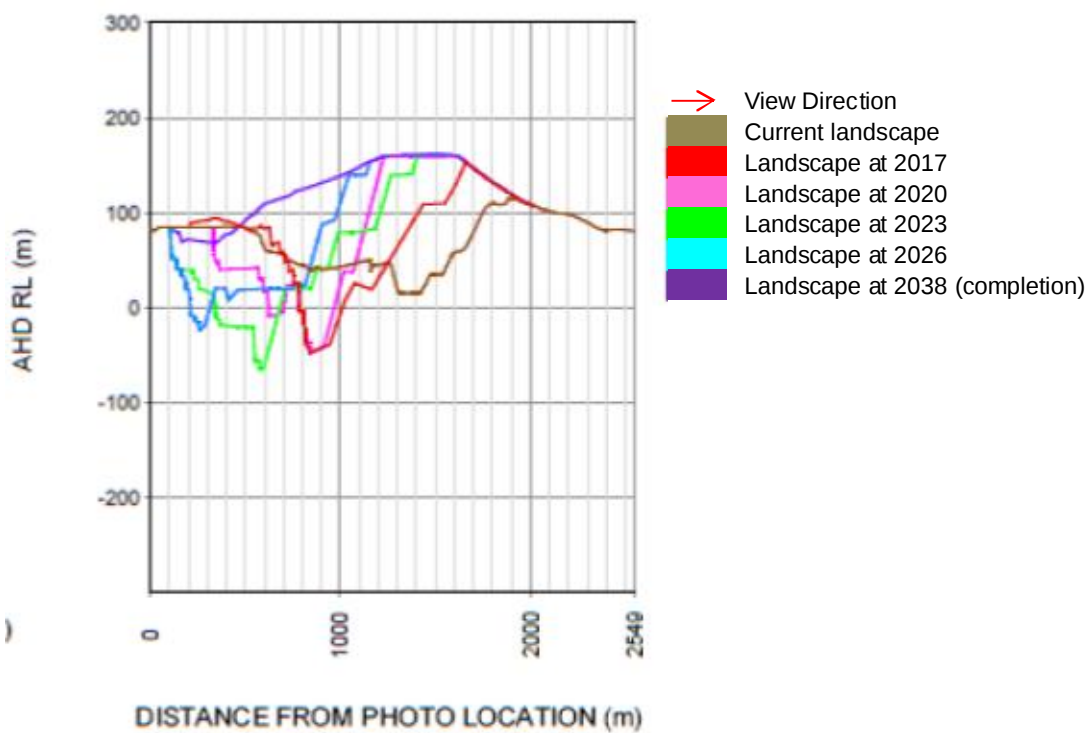


Figure 42 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 83 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 84 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 85 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 86 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 87 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 88 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 18 Viewpoint 10c – New England Highway 3

Viewpoint 10c – New England Highway 3	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	The existing bunding in the foreground will shield/screen the majority of the lower mining activity. Stockpiling will be built up beyond the height of the bunding into the view of the sensitive receivers. The proposed stockpiling will significantly alter the existing horizon with stockpiling proposed to continue throughout the operational life of the proposed mining activities.
Land Use	Highways/Tourist Routes
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – High The proposed mining operations will result in new stockpiling becoming visible to the sensitive receivers beyond the existing bunding. The existing bunding screens the current extent of the mining activity from the view of the sensitive receivers using the New England Highway. The new stockpiling will appear above the height of the existing bunding into the line of sight of the sensitive receivers and will present as unnatural stockpiles of dirt, rock and spoil. As the stockpiling is proposed to continue up until the completion of the proposed mining activity, the stockpile will remain unvegetated for the life of the proposed mining operation. The stockpiling is proposed to be rehabilitated with endemic flora on completion of the mining project and only at that stage will the landform begin to represent a natural state within the line of sight of the sensitive receivers. Mitigation measures are recommended to reduce the potential visual impact of the stockpiling on the views of the sensitive receivers using the New England Highway.

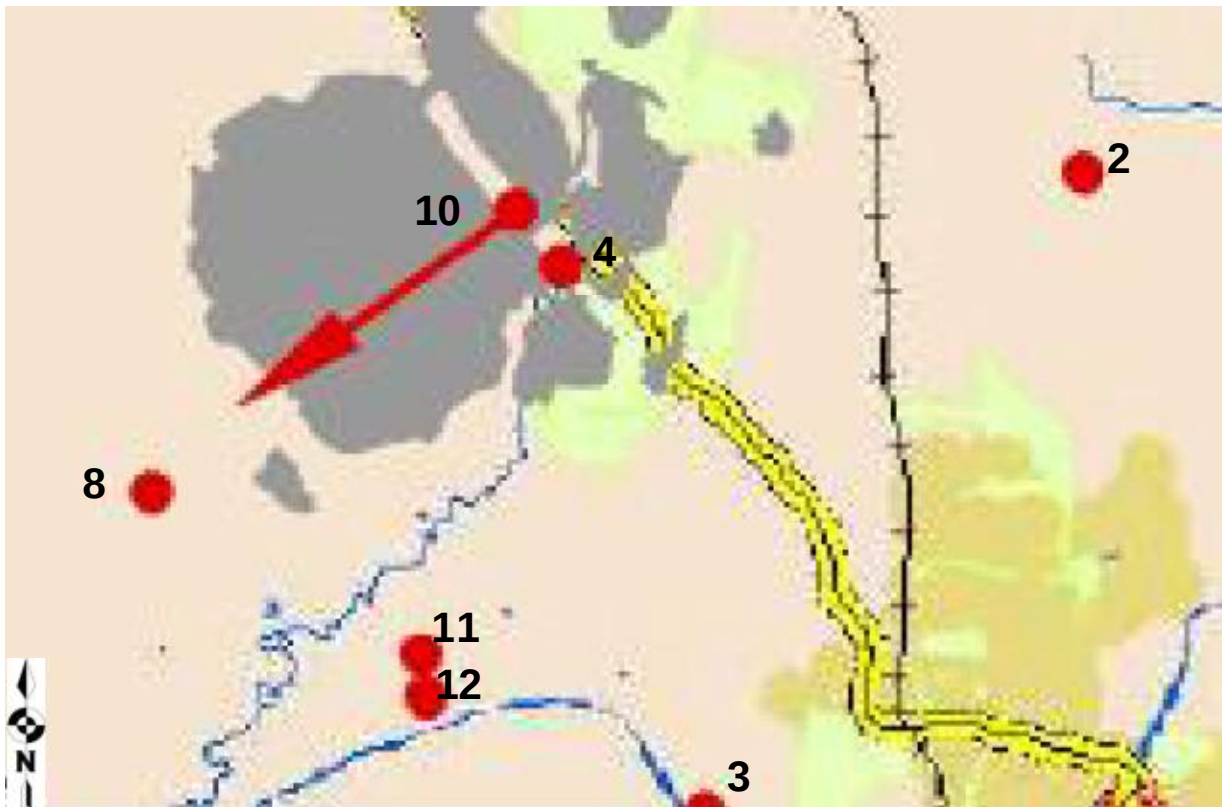


Figure 43 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

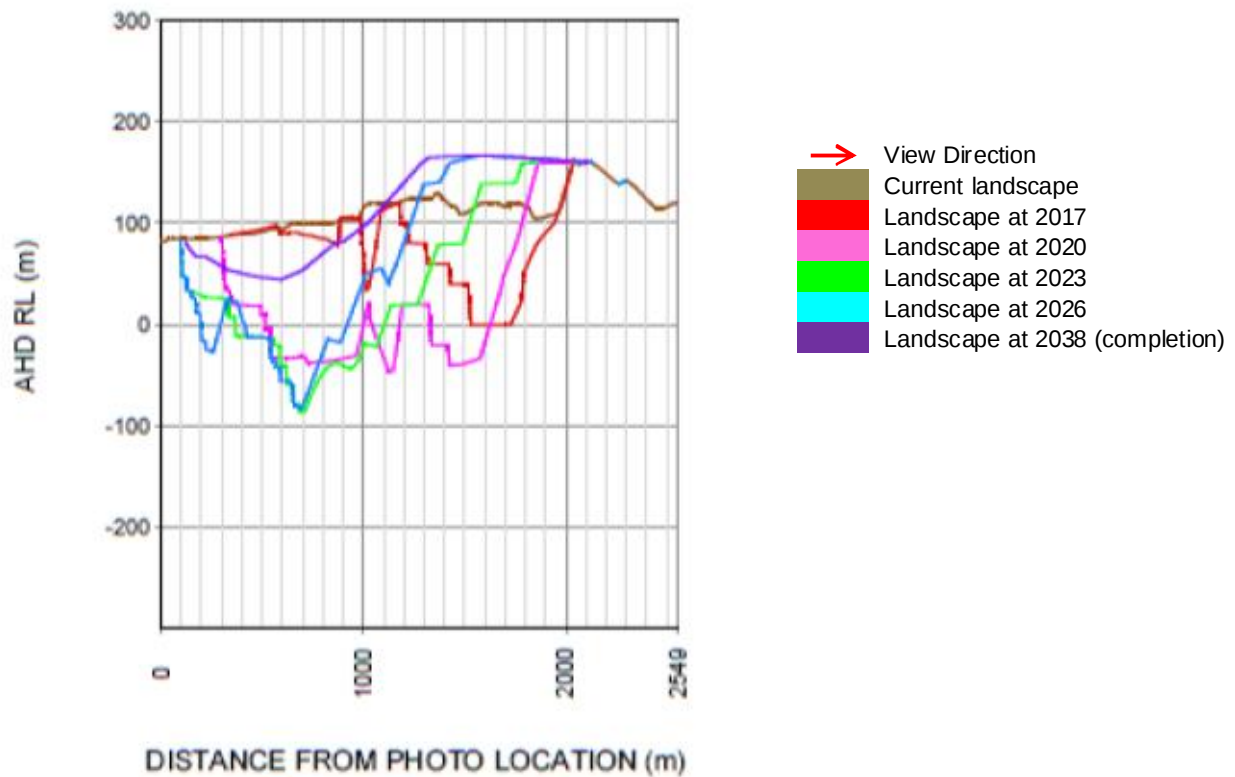


Figure 44 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 89 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 90 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 91 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 92 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 93 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 94 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 19 Viewpoint 10d – New England Highway 3

Viewpoint 10d – New England Highway 3	
View Location	New England Highway within ML1432
View Distance	0-1km
Character Zone	Character Zone 1
Visual Setting	Local
Visual Modifications	The landscape modifications include the stockpiling within the existing open cut Mine with soil, rock and spoil from the operations elsewhere within the Mine site. The stockpiling of the open cut Mine results in the regrading of the landscape to create a gradual incline from the New England Highway to the height of the existing landform on the eastern side of the mining operation. The stockpiling and stockpiling moves the ridgeline closer to the sensitive receivers and therefore modifies the horizon line.
Land Use	Highways/Tourist Routes
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Mobile
Potential Visual Impact	Landscape character and visual impact grade – High The potential visual impact is high however, the impact is a positive impact for the sensitive receivers. The proposed stockpiling within the open cut Mine will return the landscape to a visually appealing gentle hill which is proposed to be rehabilitated to appear as a natural landform. The visual impact to the view to the east of the New England Highway is considered to include positive improvements and is therefore considered to be appropriate.

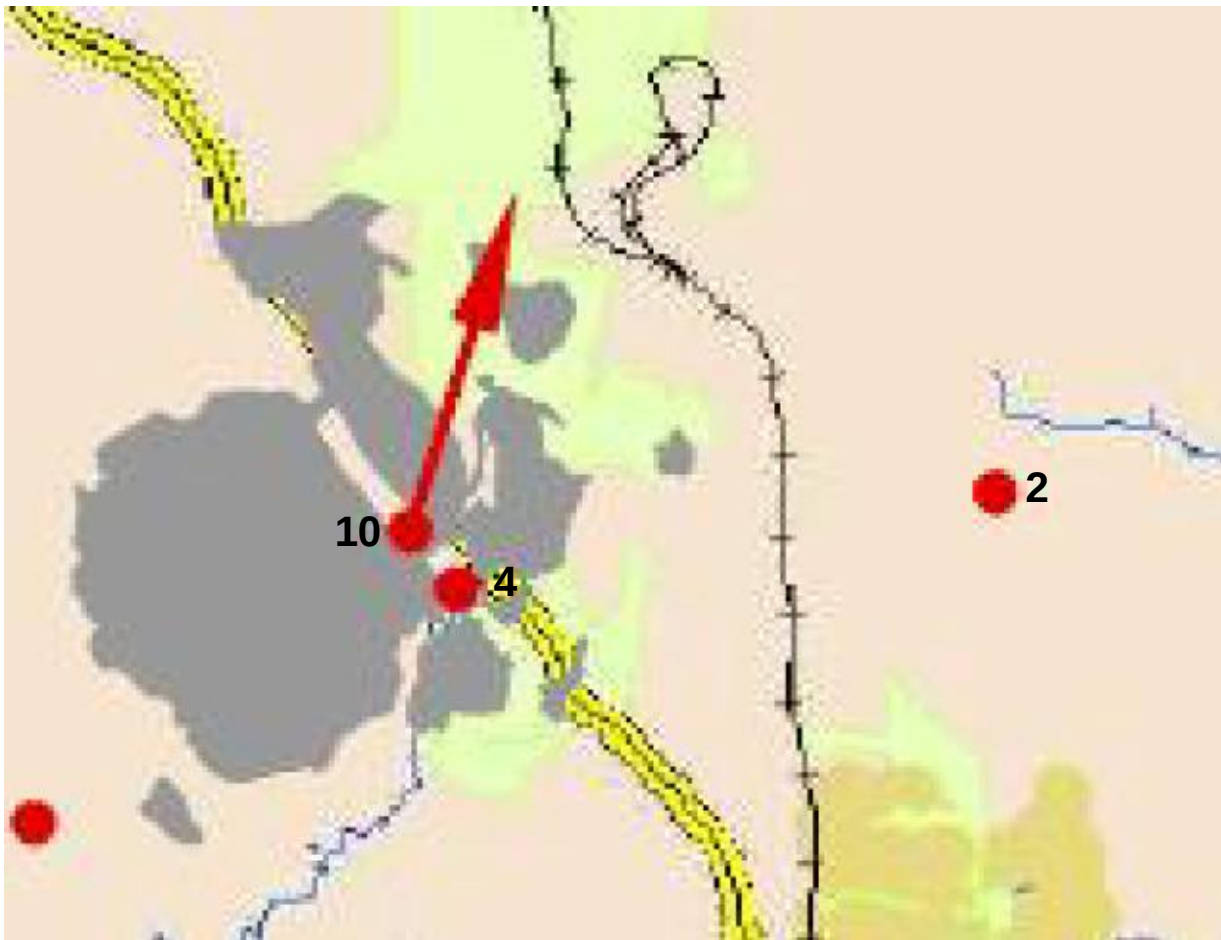


Figure 45 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

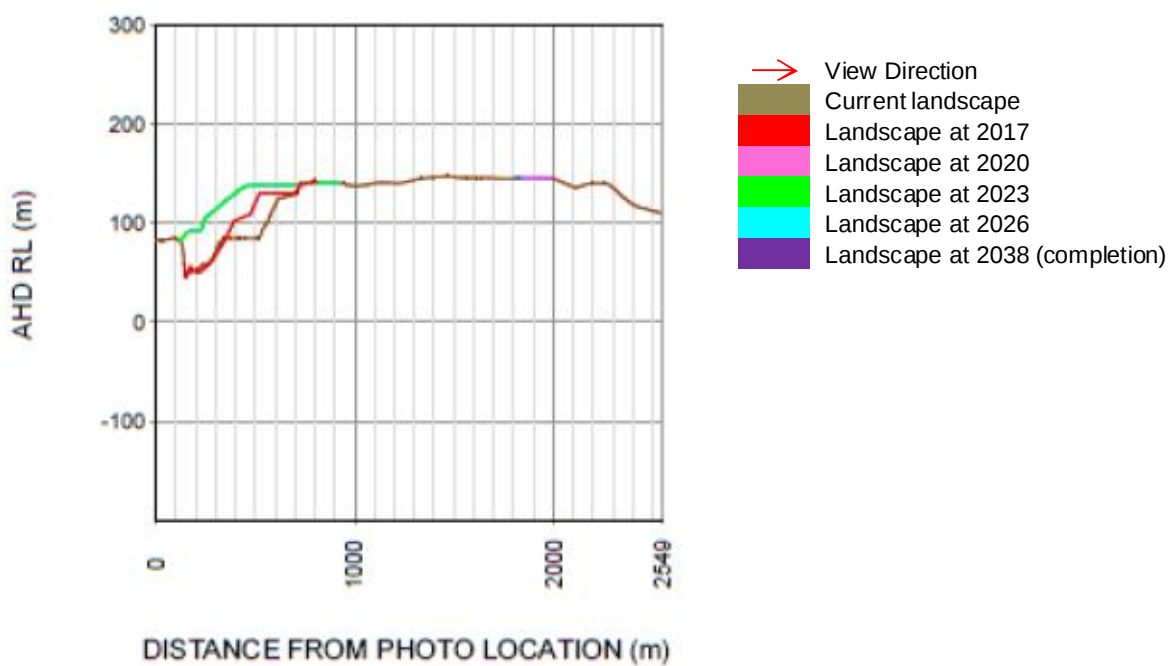


Figure 46 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 95 Current field of view
Source: RPS Australia East Pty Ltd 2014.



Plate 96 Field of view at 2017
Source: RPS Australia East Pty Ltd 2014.



Plate 97 Field of view at 2020
Source: RPS Australia East Pty Ltd 2014.



Plate 98 Field of view at 2023
Source: RPS Australia East Pty Ltd 2014.



Plate 99 Field of view at 2026
Source: RPS Australia East Pty Ltd 2014.



Plate 100 Field of view at 2038 (completion)
Source: RPS Australia East Pty Ltd 2014.

Table 20 Viewpoint 11 – Maison Dieu Road (near intersection with Dights Crossing Road)

Viewpoint 11 – Maison Dieu Road (near intersection with Dights Crossing Road)	
View Location	Maison Dieu Road (near intersection with Dights Crossing Road)
View Distance	0-1km
Character Zone	Character Zone 9
Visual Setting	Local
Visual Modifications	Visual modifications include the enlargement of the hill immediately north of the subject property on the northern side of the Hunter River. The proposed mining operations include the stockpiling of spoil material on top of the existing hill. The stockpiled material will consist of rock, dirt and other spoil that has been displaced due to the open cut mining operations within Mine Lease 1432.
Land Use	Residential
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – High The increased height of the hill immediately to the north of the site will have a significant impact on the visual character of the view as seen by the sensitive receiver. The existing natural landform as viewed from the south, across the rolling grassy terrain will be interrupted by a significantly larger stockpile of spoil and overburden. Rehabilitation of the stockpile to reinstate a natural aesthetic landscape will be progressive as the stockpile grows in height. Rehabilitation of the stockpile to reinstate a natural aesthetic will commence on ceasing of the growth in height of the stockpile. There are limited options for mitigation measures to reduce the visual impact of the proposed mining activities on the sensitive receiver at Viewpoint 11. While it is acknowledged that there will be a significant visual impact on the sensitive receiver in this instance, when rehabilitated the impact will be minimal and the visual impact is limited to a relatively small number of sensitive receptors located to the South of the mine. It is considered that the proposed mining activity has been designed so as to have a visual impact on the least number of sensitive receivers and with mitigation measures, a limited number of receivers would see significant detrimental impacts on their views should the mining operation be approved. As such, the impact on the sensitive receiver at Viewpoint 11 is considered reasonable when taking into account the visual impact of the proposed mining operations of Rix's Creek mine in totality.

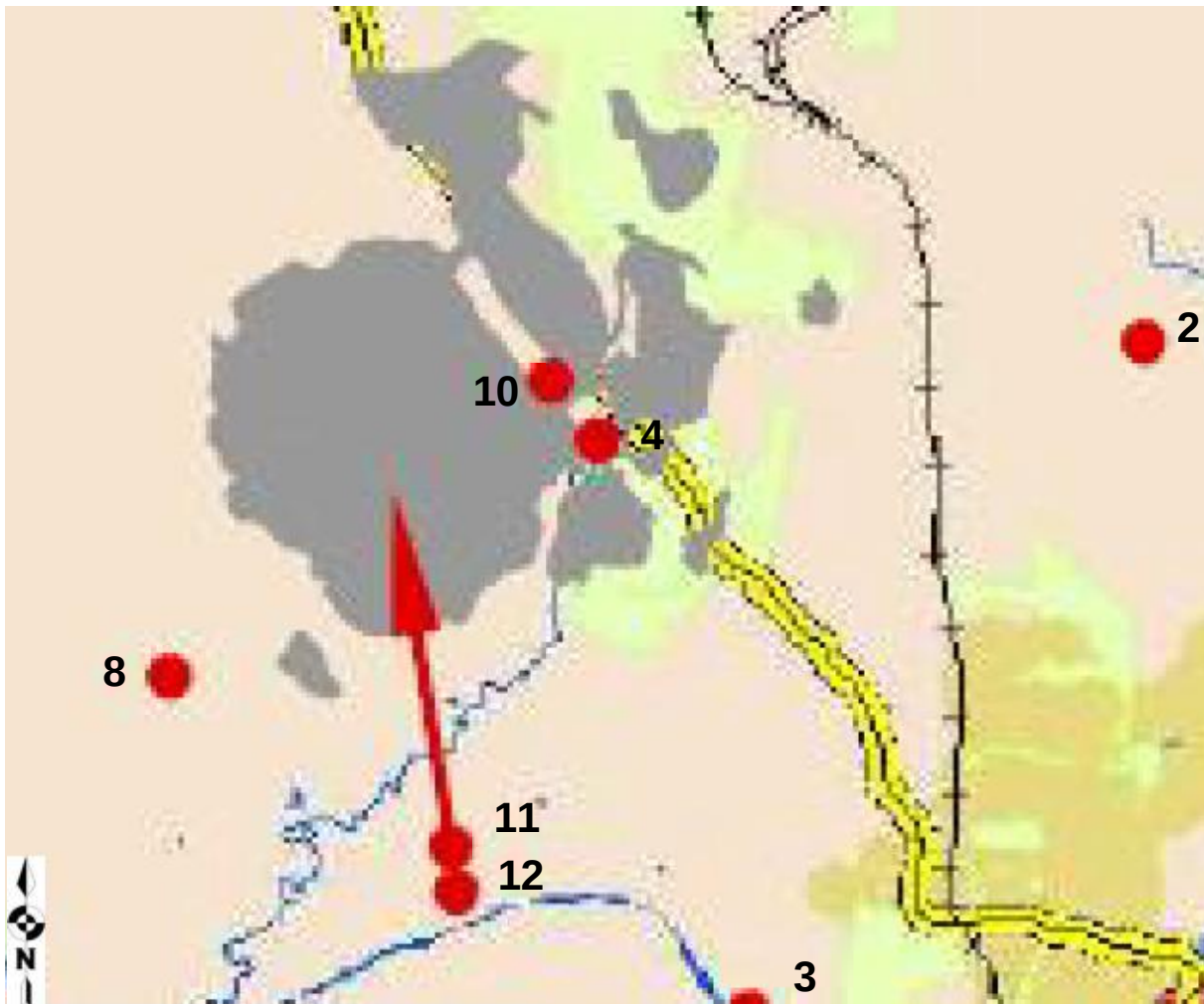


Figure 47 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

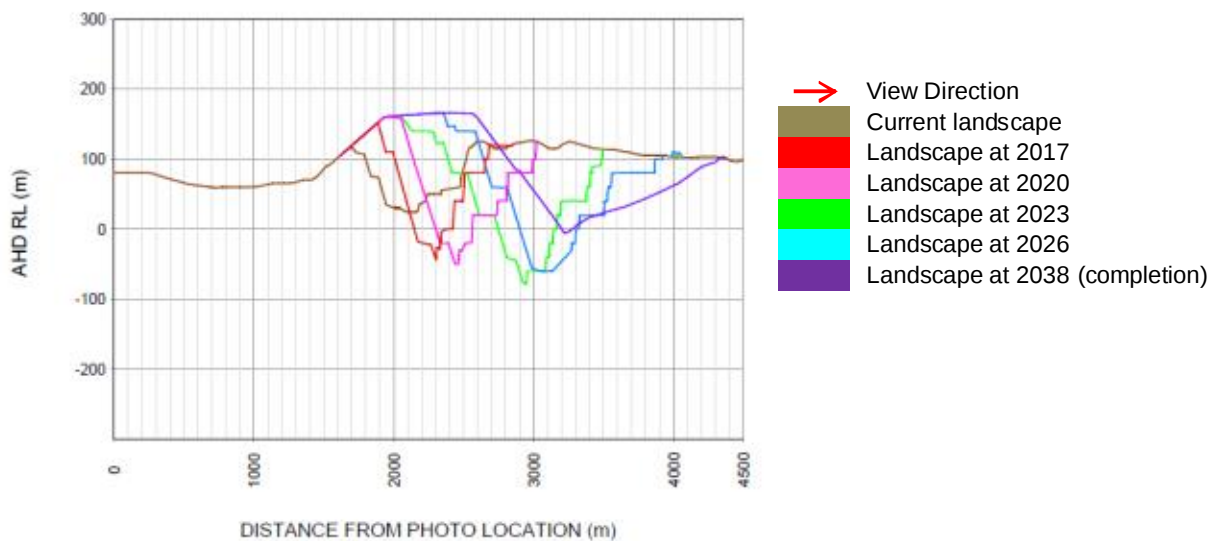


Figure 48 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 101 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 102 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 103 Field of view at 2020

Source: RPS Australia East Pty Ltd 2014.



Plate 104 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 105 Field of view at 2026

Source: RPS Australia East Pty Ltd 2014.



Plate 106 Field of view at 2038 (completion)

Source: RPS Australia East Pty Ltd 2014.

Table 21 Viewpoint 12 – Dights Crossing Road (near intersection with Maison Dieu Road)

Viewpoint 12 – Dights Crossing Road (near intersection with Maison Dieu Road)	
View Location	Dights Crossing Road (near intersection with Maison Dieu Road)
View Distance	0-1km
Character Zone	Character Zone 9
Visual Setting	Local
Visual Modifications	Visual modifications include the enlargement of the hill immediately north of the subject property on the northern side of the Hunter River. The proposed mining operations include the stockpiling of spoil material on top of the existing hill. The stockpiled material will consist of rock, dirt and other spoil that has been displaced due to the open cut mining operations within the mining lease area.
Land Use	Residential
Visual Sensitivity	High due to close proximity to the mining operations
Duration Of View	Static
Potential Visual Impact	Landscape character and visual impact grade – High The increased height of the hill immediately to the north of the site will have a significant impact on the visual character of the view as seen by the sensitive receiver. The existing natural landform as viewed from the south, across the rolling grassy terrain will be interrupted by a larger stockpile of spoil and overburden. While the stockpiling will continue throughout the operation life of the current proposal, the stockpiling, as seen from the sensitive receiver will be complete at 2020 with rehabilitation to follow the completion of stockpiling. Rehabilitation of the stockpile to reinstate a natural aesthetic landscape will be progressive as the stockpile grows in height. There are limited options for mitigation measures to reduce the visual impact of the proposed mining activities on the sensitive receiver at Viewpoint 12. While it is acknowledged that there will be a significant visual impact on the sensitive receiver in this instance, when rehabilitated the impact will be minimal and the visual impact is limited. The visual impact is limited to a relatively small number of sensitive receptors located to the South of the mine. It is considered that the proposed mining activity has been designed so as to have a visual impact on the least number of sensitive receivers and with mitigation measures, a limited number of receivers would see significant detrimental impacts on their views should the mining operation be approved. As such, the impact on the sensitive receiver at Viewpoint 12 is considered reasonable when taking into account the visual impact of the proposed mining operations of Rix's Creek mine in totality.

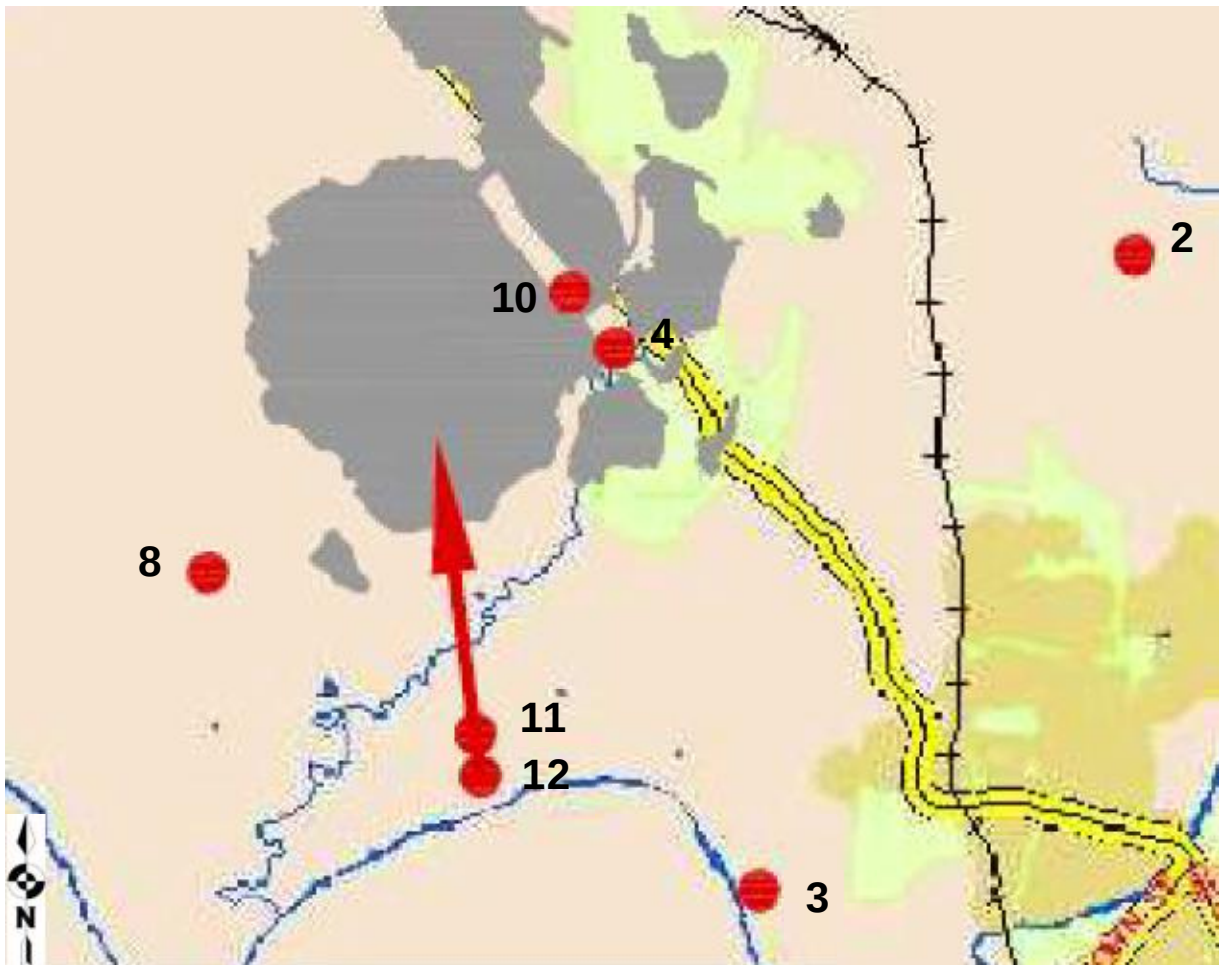


Figure 49 Viewpoint locations

Source: RPS Australia East Pty Ltd 2014.

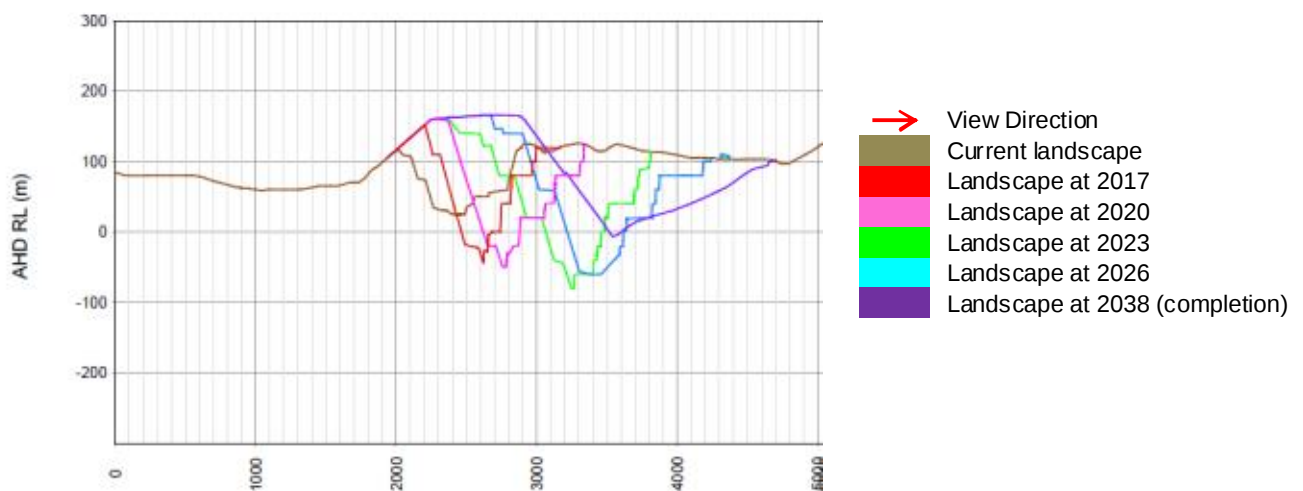


Figure 50 Cross section from viewpoint

Source: RPS Australia East Pty Ltd 2014.



Plate 107 Current field of view

Source: RPS Australia East Pty Ltd 2014.



Plate 108 Field of view at 2017

Source: RPS Australia East Pty Ltd 2014.



Plate 109 Field of view at 2020

Source: RPS Australia East Pty Ltd 2014.



Plate 110 Field of view at 2023

Source: RPS Australia East Pty Ltd 2014.



Plate 111 Field of view at 2026

Source: RPS Australia East Pty Ltd 2014.



Plate 112 Field of view at 2038 (completion)

Source: RPS Australia East Pty Ltd 2014.

4.3 Potential Impacts

4.3.1 Cumulative Impacts

The cumulative impacts of mining operations on sensitive receivers are assessed through the consideration of the combined effects of the modifications within the visual landscape as a result of mining operations in the region. There is a number of operating Mines in the vicinity of Rix's Creek which may be within the view catchment of the sensitive receivers identified in this report. Other mining operations in the locality include:

- Mount Thorley (14km South West of Singleton on the north western corner of Putty Road and the Golden Highway);
- Hunter Valley Operations (16km west of Singleton on the eastern side of the Golden Highway);
- Camberwell (immediately north of Rix's Creek and 10km north of Singleton); and
- Ashton (14km north west of Singleton on the New England Highway)

The majority of the visually sensitive receivers that have been identified and assessed previously in this report will not have potential to be impacted by the cumulative impacts of multiple mining operations due to the viewing direction and current landform screens. Receivers that may be impacted by the Rix's Creek Mine ongoing operations in addition to existing operations include receivers along the New England Highway to the north of Singleton.

While mobile receivers using the New England Highway will not experience cumulative impact of multiple mining operations in any single view, mining operations can be viewed along several sections within the 35km north of Singleton along the New England Highway. The proposed ongoing development and operation of Rix's Creek Mine includes progressive rehabilitation and modification of the New England Highway Corridor to improve the visual amenity of Road uses as they pass through ML1432. The ongoing landscape and vegetation modifications to the New England Highway corridor is considered to reduce the cumulative impact over time as the new bunding and rehabilitation screens the mining activities from the Highway.

Based on a review of the Visual and Landscape Assessment, it is clear that no significant cumulative impacts will occur to sensitive receivers in the region considering the directions that the Mine is viewed from and the existing landform and vegetation present in the study area.

5.0 Mitigating Measures, Management and Monitoring

The proposed development incorporates extensive rehabilitation of the modified and unmodified landforms on the site. Current methods of rehabilitation will be continued in accordance with the existing Mining Operations: Landscape Management Plan (Bloomfield, 2011) which comprises of the following Landscape Management Plans:

- Mining Operations (Rix's Creek Mine): Rehabilitation Management Plan (Bloomfield, 2011);
- Rix's Creek Mine Final Void Management Plan (RPS Aquaterra, 2012); and
- Mining Operations (Rix's Creek Mine, Mine Closure Plan 9 Bloomfield, 2011).

The purposes of this Plan are to inscribe the landscape management techniques and responsibilities during the operation and on the closure of mining activities on the site.

5.1.1 Progressive Rehabilitation

The ongoing operations of the mining project will include subsequent ongoing active Mine rehabilitation to reduce any impact on sensitive receivers. Rix's Creek currently operates utilising an aggressive rehabilitation program. The program has been designed to ensure that rehabilitation of the site is progressed so as to immediately follow the mine dump formations and rehabilitate these formations before the formations are completed.

The sites assessed above including viewpoints 8a and 8b have undergone modification as part of current operations and have been rehabilitated to match the existing landscape character and vegetation cover. The existing rehabilitated land at Viewpoint 8a is shown in Plate 113.



Plate 113 Existing rehabilitated land at Viewpoint 8b

Source: RPS Australia East Pty Ltd and The Bloomfield Group, 2014

The existing rehabilitated land appears consistent with the existing landform in the locality of the viewpoint and without prior knowledge of mining operations in that locality, appears as a natural landform.

The residential sites along adjacent to the intersections of Maison Dieu Road and Dights Crossing Road also experience an existing modified view. The views achieved to the north from Viewpoints 11 and 12 have been modified by way of additional spoil and overburden material being built up along the southern periphery of the Mining Lease area to create a series of rises in the landscape. The existing rehabilitated land was rehabilitated progressively throughout the project and the result is a landform that appears natural as seen in Plate 114.



Plate 114 Existing rehabilitated land at Viewpoint 12

Source: RPS Australia East Pty Ltd and The Bloomfield Group, 2014

The progressive rehabilitation of the site will continue to include significant planting of grasses, shrubs and tree species endemic to the locality on all newly formed bunding and mining landforms to reduce the contrast between the natural landforms and modifications to the landscape as a result of mining operations.

5.1.2 Foreground Vegetation Screening

Existing mature vegetation screening can be seen within the existing mining operations and consent areas. The existing rehabilitated mature vegetation can be seen primarily along the New England Highway and screens significant portions of the mining operations from the view of the Highway users (Figure 164 and 165).



Plate 115 Existing rehabilitated land near Viewpoint 4

Source: RPS Australia East Pty Ltd



Plate 116 Existing rehabilitated land at near Viewpoint 4

Source: RPS Australia East Pty Ltd

Plate 115 shows existing modified landscape and mature plantings on the modified landscape to the west of the New England Highway and South of Rix's Creek. Plate 116 shows an example of more recent revegetation of the modified landscape further north to Plate 115, which was modified more recently and rehabilitated at the earliest opportunity post mining operation on that land.

It may be appropriate to consider the installation of further on or off site localised vegetation screens in some locations made up of endemic flora that are compatible with the surrounding environment. These screens may reduce the impact of landscape modifications within visual catchment of residential properties or tourist sites and sensitive receivers identified in this report. Particular consideration should be given to the revegetation of the western side of the New England Highway to alleviate the ongoing visual impact of continued mining operations in close proximity to the Highway.

Vegetation screening is recommended along the length of the New England Highway within the Mining Lease 1432 to reduce the impact of the mining operations and stockpiling on the sensitive receivers using the Highway Thoroughfare. The vegetation screen is best placed on the upper half of the bunding to ensure that the height of the vegetation can break up the view through the canopy to the stockpiling.

It may be appropriate to remove some or all of the vegetation screening on completion of the mining project to open up the views and vistas that may be achieved of the wider region.

6.0 Conclusion

Rix's Creek mining operations are proposed to continue for a further 21 years within which time significant landscape modifications including cut and extraction of coal as well as development of significant areas of stockpiling and fill within decommissioned open cut mines.

During, and on completion of the proposed mining activity, ongoing rehabilitation of the land that is no longer required for mining purposes will be operating to reinstate landforms that are consistent with the landforms that are characteristic of the locality. Some of these new landforms will be visible from tourist routes, Highways, business premises and private residential properties.

The majority of the sensitive receivers assessed in this report experienced some level of visual impact to the views that were obtained from the viewpoints selected. The viewpoints within Mining Lease 1432 along the New England Highway experience a moderate to high level of visual impact to the views of the sensitive receivers utilising this thoroughfare. The visual impacts along this section are considered to be reasonable along this section of the highway provided that the visual impacts are mitigated by way of screen plantings.

The sensitive receptors that are located in excess of 5km from the proposed mining operations are generally considered to have low to moderately low visual impacts on the views of the sensitive receivers for a number of factors including distance, existing landform and vegetation screening portions of the landscape modifications from direct view and the nature of the modifications themselves fitting within the existing landscape characteristics.

A number of residential properties to the south of the proposed mining operations are acknowledged to experience visual impacts. Considering the relatively small number of sensitive receptors and the intent of the mining operations to have minimal visual impact on the surrounding community, the visual impacts to the sensitive receptors to the south of the proposed mining operations are considered reasonable.

The proposed Rix's Creek Continuation of Mining Project is considered to have acceptable landscape character and visual impacts on the surrounding locality and region. As a result of this assessment, it is considered that the proposed mining project is suitable for support on the grounds of landscape character and visual impact assessment.