NEW HOPE GROUP

15. Visual Amenity

Contents

15. Visual Amenity and Lighting

15.1. Introduction

This Chapter provides a description of the existing landscape character and visual amenity of the revised Project. It also identifies potential visual impacts of the revised Project and mitigation measures proposed to avoid or minimise adverse impacts.

15.2. Methodology

The objectives of the visual impact assessment were to:

- describe existing landscape character and visual values of the revised Project site;
- conduct an assessment of photographic documentation from locations surrounding the revised Project site, including from sensitive visual receptors, to determine the visibility of the revised Project;
- undertake preparation and interpretation of a viewshed analysis conducted from various vantage points surrounding the revised Project site;
- identify potential visual impacts as a result of the revised Project, particularly to sensitive visual receptors; and
- recommend mitigation measures based on identified potential impacts to visual values and amenity.

The methodology adopted for the visual impact assessment included:

- review of documentation and background information for the revised Project;
- review of aerial photography and contour maps;
- site appraisals and reconnaissance, conducted in October 2008 and April 2013, capturing photographic documentation for the determination of the landscape character and visual values of the existing visual environment;
- identification of sensitive receptors located within approximately 5 km of the revised Project;
- description of potential impacts to sensitive visual receptors from various locations surrounding the revised Project during both construction and operation; and
- the identification of appropriate mitigation measures that would be implemented during both construction and operation of the revised Project.

15.2.1. Sensitive Visual Receptors

Perceived visual impacts are relatively subjective and are predominantly related to the sensitivity of the view point and the perspective of the viewer. The potentially sensitive locations include:

- residential dwellings;
- identified locations of public and private importance;

- tourist destinations and heritage sites; and
- major and secondary roads.

Residential dwellings are only considered as sensitive visual receptors to the extent that they would be occupied during construction and operation of the revised Project. Acland has been considered as a sensitive receptor for the purposes of this assessment.

Roads are only considered as sensitive receptors to the extent that views are altered for vehicle occupants. As a result, visual impacts as viewed from roads are generally considered minimal and confined to the duration of time that an impact is in view of a vehicle occupant.

15.2.2. Landscape Character

The description of landscape character provides an overview of the varying, distinctive landscapes that exist within an environment. Rather than defining landscapes that are visually better or worse, landscape character describes the differences between landscapes and the elements that make them unique.

In order to understand how a particular noticeable change to the visual environment would impact on identified sensitive receptors, it is necessary to determine the overall sensitivity of a particular landscape to a noticeable change. Landscape sensitivity refers to the overall potential impact that could be expected on a sensitive receptor as a result of a noticeable change to the landscape. Landscape sensitivity does not define the nature and scale of the proposed activity, but rather, describes the overall ability of the existing environment to accommodate change. Landscape sensitivity levels are:

- **Low sensitivity** – Very few visual impacts would be experienced as a result of the proposed change to the visual environment. A low sensitivity to visual change is either as a result of the proposed activity integrating efficiently with the existing environment and/or there are a very small number of, or no, sensitive receptors with potential views of the proposed activity.
- **Medium sensitivity** – Some visual impacts would be experienced as a result of the proposed change to the visual environment. A medium sensitivity to visual change is either as a result of the proposed activity only partially integrating with the existing environment and/or there are limited sensitive receptors with potential views of the proposed activity.
- **High sensitivity** – Significant visual impacts would be experienced as a result of the proposed change to the visual environment. A high sensitivity to visual change is either as a result of the proposed activity not integrating with the existing environment and/or there are numerous sensitive receptors with potential views of the proposed activity.

Landscape character for the revised Project site and the broader regional area is described in **Section 15.3**.

15.2.3. Viewshed Analysis

A viewshed analysis is an assessment of the overall level of visibility a specific vantage point would have of the existing landscape. The analysis models the elevations of the terrain to determine the overall extent of the environment that would be visible from the vantage point. This analysis provides for an understanding of the overall visibility of the surrounding environment, prominent sight lines and the potential sensitivity to visual change.

As a viewshed analysis only considers terrain in its assessment, it does have its limitations, and as a result, it should not be used in isolation. It is used as a tool to assist in developing a better understanding of the potentially visible components of the landscape. Factors that are not considered in a viewshed analysis include:

- the height of the viewer or the height of a structure that the viewer may be standing on that may increase the overall visibility; and
- the presence of vegetation, buildings or other non-topographical features that may constrain the overall level of visibility.

A viewshed analysis was undertaken for the revised Project at a number of key locations surrounding the revised Project site. The viewshed analysis forms the basis for developing an understanding of the overall level of visibility that the project site would have from the sensitive receptors. The results of the viewshed analysis undertaken for the revised Project are discussed in **Section 15.3.6**.

15.2.4. Visual Impact Assessment

Two methods have been adopted to assess the potential visual impacts associated with the revised Project. Used in conjunction, these methods enable the reader to develop an understanding as to how the revised Project may be viewed and the potential impacts that may be experienced. These methods are described in the following sections.

Photographic Montage Representation

A photographic montage provides a conceptual graphic representation of the potential views of the revised Project that would be experienced by a viewer. It provides an opportunity for the potential viewer to have a greater understanding of the possible visual impacts that may be experienced. Photographic montages of the revised Project are provided in **Section 15.4.2**.

The photographic montages provide a conceptual representation of the potential disturbance to the landscape by the end of the revised Project's operation, and includes providing a representation of the mine pit areas and out-of-pit spoil dumps.

Due to the temporary nature of the revised Project's construction, a photographic montage has not been prepared for this stage.

Visibility Analysis

An assessment of the potential visual impact of the revised Project has been undertaken. In order to undertake the assessment of the revised Project, key views were appraised based on the consideration of specific visual assessment criteria. The visual impact assessment methods described

in this section have been derived from the assessment criteria outlined in the *Guidelines for Landscape and Visual Impact Assessment, 2nd Edition* (The Landscape Institute and Institute of Environmental Management and Assessment, 2002) and have been adapted to suit the revised Project's regional context. The visibility analysis for the revised Project is provided in **Section 15.4.2**.

The criteria outlined in **Table 15-1** provide an overview of the revised Project within the visual environment. This table details the factors that are considered when undertaking an assessment from a particular viewing location.

Table 15-1 Visual assessment criteria

Criteria	Description
Distance	Greater distances between the viewing location and the visible components of the revised Project site reduce the level of detail that is observable within the view. Greater distances also make it difficult to distinguish the revised Project site from its background.
Elevation	Project sites that are elevated higher than the viewing location would be viewed against the sky. Project sites that sit lower than the viewing location would be viewed against the surrounding landscape allowing it to be better accommodated within the visual environment.
Size	The larger the project features and activities within the visual environment, the greater the level of visibility from the viewing location.
Context	The degree to which the revised Project is in character with the context of the surrounding environment.
Activity	Movement of vehicles and light reflection changing with movement attract the eye making the revised Project site more visually prominent. Static, neutral coloured project features are less noticeable within the visual environment.
Change	The degree of change in the view and the rapidity of the process of change contribute to the overall visibility of the revised Project site.

A key component of the visual assessment is determining whether the revised Project would be visible from the identified viewing location. **Table 15-2** outlines the levels of visibility that were considered for the assessment of the revised Project.

Table 15-2 Project visibility

Visibility	Description
None	The revised Project site would not be visible from the viewing location.
Negligible	Only a very small component of the revised Project site would be visible and would be at such a distance that is scarcely appreciated.
Slight	The revised Project site would constitute a minor component of the visual environment. The revised Project site may be noticed by a receiver.
Moderate	The revised Project site would form a visible and recognisable new element within the visual environment and may be readily noticed by a receiver.
Substantial	The revised Project site forms a significant and immediately apparent part of the visual environment that affects and changes the overall landscape character.
Severe	The revised Project site would be the dominant feature of the visual environment. It would make other features subordinate and would significantly alter the landscape character.

The overall sensitivity of a particular viewing location or area to change in the visual environment is an important factor in undertaking an assessment of the revised Project's potential visual impact. A viewing location with a higher level of sensitivity, such as a residential dwelling, would be more susceptible to visual impacts than a viewing location with a lower sensitivity, such as an industrial property.

The overall visual impact to a particular viewing location is determined through a combined appraisal of the visual assessment criteria, the revised Project's visibility and the viewing location's sensitivity. The levels of impact that may be experienced are outlined in **Table 15-3**.

Table 15-3 Impact assessment

Impact level		Description
Substantial Adverse Impact		The revised Project would result in significant deterioration of the existing visual environment.
Moderate Adverse Impact		The revised Project would result in noticeable deterioration of the existing visual environment.
Slight Adverse Impact		The revised Project would result in barely perceptible deterioration of the existing visual environment.
Slight Beneficial Impact		The revised Project would result in a barely perceptible improvement of the existing visual environment.
Moderate Beneficial Impact		The revised Project would result in a noticeable improvement of the existing visual environment.
Substantial Beneficial Impact		The revised Project would result in a significant improvement of the existing visual environment.
No Change		No discernible deterioration or improvements to the visual environment.

3D Visualisation

A 3D visualisation has been prepared for the revised Project for use primarily as a tool for stakeholder consultation to aid in presenting the overall impact of the revised Project. The 3D visualisation is also beneficial in somewhat validating the potential impacts identified through the photographic montage representation and the visibility analysis (limited to the constraints of the model). As such, snapshots of the 3D visualisation from each of the viewpoints used in the visual impact assessment of the revised Project are provided in **Section 15.4**.

15.3. Existing Visual Environment

15.3.1. Planning Requirements

This section provides an overview of the State and local planning instruments of relevance to the revised Project's scenic values.

State Planning Policy 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities

The purpose of State Planning Policy 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities (SPP 1/02) is to protect airports and aviation facilities from incompatible development.

Night lighting associated with the revised Project has the potential to impact on operations at the Oakey Airbase and Training Centre. In addressing the impacts of the revised Project on night lighting within this assessment, the requirements of SPP 1/02 have been considered and appropriate mitigation measures identified.

It should be noted that at the time of writing the EIS, the *State Planning Policy* for Queensland was under development. It is expected that the operations of the Oakey Airbase and Training Centre will be protected under the new *State Planning Policy* once released. NAC has held discussions with the Department of Defence in relation to impacts on aviation activities. To this end, NAC has prepared an Aviation Hazard Management Plan which is located in **Appendix J.17**.

Planning Scheme

The revised Project is situated within the TRC area. While activities located within the revised Project site (on lease) would not be assessable against the Toowoomba Regional Planning Scheme (planning scheme), aspects of the planning scheme relevant to scenic amenity have been considered for this assessment.

The planning scheme provides a strategic framework containing a number of outcomes for ensuring appropriate development occurs within the TRC area. Visual amenity is addressed within the 'Natural Resources and Landscape' Strategic Outcome where it states:

> *The scenic landscapes and landscapes of rural and heritage value help define the character and identity of Toowoomba. Changes to the essential characteristics of landscape are undertaken in a measured and informed manner.*

In addressing the scenic values associated with the revised Project, this Strategic Outcome will be considered through identifying potential impacts and appropriate mitigation measures.

15.3.2. Existing Landscape Character

The regional and local landscape may be considered to be of medium visual quality, as all landscape elements, including landform, land cover, water form and features, are varied, yet are fairly common and not outstanding, unusual or distinctive in character.

Despite agricultural land uses and existing mining activities dominating most of the landscape, the region maintains a relatively natural outlook, including vegetated areas within riparian corridors along most of the creeks and within certain road reserves.

Mining activities occur within the landscape and have changed not only the presence of structures and vegetation, but also topography. Generally, the most visible aspects of the current mining activities from the Mine are the active spoil dumps, the rehabilitated elevated landforms and the associated infrastructure.

Townships within the region have maintained their predominate rural characteristics of residential dwellings centred around convenience or service facilities, despite the growing trend to subdivide and develop large agricultural blocks that fringe on the existing townships.

Apart from the Warrego Highway, roads within the Study area have generally maintained their rural characteristics with narrow lanes and limited curbing, and are primarily used by local rural or general mining traffic. Many of the roads are unsealed and are visually unimposing.

In its predominately rural nature, the landscape character of the local and regional landscape has a medium to high sensitivity to change due to the presence of rural land uses and expansive views from numerous locations surrounding the revised Project. As a result, the ability of the landscape to absorb the land use changes that will be associated with the revised Project is somewhat limited. However, existing mining operations at the Mine will contribute to offsetting the visual impacts caused by the revised Project.

Different landscape character types identified within and around the revised Project and their overall level of perceived sensitivity are detailed in **Table 15-4**.

Table 15-4 Landscape character types

Landscape character unit	Description	Landscape sensitivity	Relationship to revised Project
Flat Farmland	The landscape typically contains a mix of vegetated and cleared flat farming land. Tree-lined verges may still exist along property boundaries and roads. The landscape can include smaller constructed elements, such as road and rail networks, farm buildings, fences and power lines. The landscape is predominately flat and expansive views are likely within cleared areas.	**Sensitivity to Change: Medium** Although modified from its natural form, views are generally over an undeveloped, expansive landscape. Any changes to the landscape are likely to be visible from a considerable distance.	Flat rural farmland is a prominent landscape type within the visual environment. This landscape is primarily used for grazing and some cropping, however, some areas of remnant vegetation have been retained. Existing mining operations are also visible within this landscape character type. These activities include active mining activities, mining infrastructure, mine pit areas and out-of-pit spoil dumps.
Hilly Farmland	The landscape typically contains a mix of vegetated and cleared farming land. Tree-lined verges still exist along property boundaries, roads and hilltops. The landscape can include smaller constructed elements, such as road and rail networks, farm buildings, fences and power lines. The landscape undulates and views can either be restricted or expansive depending on the viewer's location within dips or on rises.	**Sensitivity to Change: Medium** Although modified from its natural form, views are generally over an undeveloped, expansive landscape. Depending on the viewing location, the rise and fall of the landscape provides the opportunity for both vantage points and visual barriers.	Gently undulating, vegetated grazing land is a predominant landscape type within the visual environment. Vegetation primarily exists in this landscape character type along road verges, fence lines and banks of watercourses. Existing mining operations are also visible within this landscape character type. These activities include active mining activities, mining infrastructure, mine pit areas and out-of-pit spoil dumps.

Landscape character unit	Description	Landscape sensitivity	Relationship to revised Project
Remnant/ Natural Forest	The landscape occurs primarily in National Parks, State Forests, State Parks, Regional Parks and local reserves; however, it can also exist in rural areas that have not been subjected to prior clearing activities. Generally, the vegetation is dense and very few modifications have been made to the landscape. Access into and within this landscape is usually limited to minor roads and access tracks.	**Sensitivity to Change: High** Large scale changes to this landscape would be highly visible from external vantage points. However, due to the development restrictions generally in place, large scale changes to the landscape are unlikely. As vantage points within this landscape are limited, most views will be from external locations. Due to the dense nature of the vegetation, this landscape provides the opportunity to act as a visual barrier between a particular vantage point and the point of interest.	This landscape occurs in both the flat and hilly farmland areas within the local visual environment. Remnant/natural vegetation is most prominent along localised hills and ridges, including Bottle Tree Hill, and along certain road verges, particularly the Pechey-Maclagan Road and Acland-Silverleigh Road.
Regrowth Bushland	The landscape has been previously cleared and, vegetation has begun to regrow. Generally, the vegetation within this landscape is not as dense as the vegetation within a remnant forest. Access into and within this landscape is usually limited and confined to old access tracks.	**Sensitivity to Change: High** Changes to this landscape as a whole would be highly visible from external landscapes. However, due to the history of the landscape, it is likely to be more acceptable than if the changes were to occur in a remnant forest. As vantage points within this landscape are limited, most views will be from external locations. This landscape provides the opportunity to act as a visual barrier between a particular vantage point and the point of interest. Views of different components of the revised Project site, such as the road surface or the interchanges, will result in different levels of sensitivity.	Areas of regrowth vegetation are scattered throughout the visual environment. Regrowth vegetation is common at various locations to the north of existing mining operations.

Landscape character unit	Description	Landscape sensitivity	Relationship to revised Project
Rural Townships	This landscape occurs at different locations throughout the broader environment, usually along major road networks, and exists primarily to provide minor services or accommodation to nearby employment opportunities. Development within this landscape is primarily confined to low-scale residential properties and some commercial and industrial activities.	**Sensitivity to Change: Medium** Minor changes to this landscape are unlikely to conflict with the overall character. Views of this landscape will consist primarily of buildings, infrastructure and some vegetation. Due to the increased intensity of the sensitive receptors within this landscape, there is an increased level of sensitivity that should be considered.	Oakey is located approximately 12 km south of the revised Project, Jondaryan is located approximately 14 km south-west of the revised Project site, with Goombungee located approximately 21 km east of the revised Project site.
Mining	This landscape has been subjected to intensive mining activities that have changed not only the presence of structures and vegetation, but also the topography. Generally, the most visible aspects of this landscape are the active spoil dumps, the rehabilitated elevated landforms and the associated infrastructure. Access into this landscape is generally restricted to mining personnel.	**Sensitivity to Change: Low** Due to the substantially altered landscape, further changes to this landscape are unlikely to result in sensitivity concerns.	Mining operations are a visually prominent landscape within the visual environment, due to the presence of the Mine. This landscape type is visible from numerous locations, particularly from high points, and is a contrasting element within the visual environment as a whole.

15.3.3. Regional Landscape and topographical context

The revised Project site is located along the eastern fringe of the Moreton uplands which extends inland from the Toowoomba range. The region also forms an important southern gateway to the Bunya Mountains.

The broader regional landscape is characterised by:

- gently sloping rural lands broken by localised ranges and mountains;
- a combination of agricultural crops and grazing pastures which display a range of colours and textures at different times of the year;
- an overlay of rural roads, mostly unsealed, largely defined by treed verges;
- occasional hills and peaks which rise out of the plains and provide visual relief;
- variable vegetation coverage which is highest along roadside areas, local hills and ridgelines and individual patches within properties; and
- isolated rural settlements situated primarily around significant transport nodes, which punctuate the otherwise non-built landscape.

15.3.4. Local Landscape and topographical context

The scenic values of the local landscape include attractive rural views, local hills and mountains (refer to **Photograph 15-1**) and Acland. In particular, the local area is characterised by:

- a flat to undulating landscape which is mostly open with variable roadside and ridgeline vegetation;
- a landform which varies considerably from cleared flat plains to vegetated land flanked by a number of small hills and mountains covered with dense vegetation;
- one small locally prominent hill, Bottletree Hill (elevation of 514 m), which is situated to the east of Acland and provides for views to the west as well as over the revised Project site;
- Acland which comprise a number of small residential properties, a park and a historic mine site (Acland No. 2 Colliery);
- significant vegetation concentrated along roadsides, local hills and ridgelines and individual patches within properties;
- pastures and cultivated fields on the flat land;
- one ephemeral creek, namely Lagoon Creek, drains in a south-westerly direction across the revised Project site; and
- the mining activities associated with the Mine.

Photograph 15-1 Representation of the Local Landscape

15.3.5. Key Landscape Features

Cropping and grazing agriculture and mining are the most visually prominent activities within the region. Acland is located between the MLA surface rights areas on Acland-Silverleigh Road and was originally established to service past mining activities within the local area. Built infrastructure, such as roads, are common within the landscape and vary in quality and width. The road network services farming and mining activities as well as provides links between townships.

Existing mining operations form a prominent feature within the local landscape and have altered the visual landscape from the views of predominantly rural uses that are typical of the broader region. Although rehabilitation works have been undertaken, mining activities are visible from a number of locations surrounding the revised Project. In particular, mining activities are currently visible from a 4 km stretch of Oakey-Cooyar Road from chainage 10.5 km (reference point is 0.0 km at the intersection of Oakey-Cooyar Road and Showgrounds Road). **Photograph 15-2** provides a typical view of the mining activities and out-of-pit spoil dumps from Oakey-Cooyar Road. Traffic along the road is relatively frequent and a number of private properties lie within close proximity.

Photograph 15-2 Existing mining activities from Oakey-Cooyar Road

Photograph 15-3 depicts vegetative screening and bunding that has been implemented to minimise visual impacts associated with mining activities at the Mine. Although the mitigation measures implemented in **Photograph 15-3** have reduced the potential for views of the existing mining activities, they have also resulted in an altered visual landscape. The expansive views of the relatively flat agricultural land have been replaced by vegetative screens and bunds that have substantially limited the view to the visible horizon.

The combination of the vegetative screening across the centre of the photograph and the grassed bund behind ensure that that no existing or remnant mining activities are visible from the roadway. The level of visual screening ensures that the views towards the Mine are not dissimilar to views of the surrounding, predominately rural landscape. It is envisaged that over time the vegetative screening will mature to mimic the existing vegetated road reserves, which are common amongst the regional landscape.

Photograph 15-3 Rehabilitation works

The landscape is generally cleared for grazing and cropping land uses, with only patches of vegetation remaining on creek lines, road corridors and ridgelines. **Photograph 15-4** shows the vegetated road verge of Pechey-Maclagan Road. This example of a vegetated road reserve is common throughout the regional landscape.

Photograph 15-4 Vegetated road verge

Another prominent feature within the visual environment is the JRLF, shown in **Photograph 15-5**. The JRLF is located adjacent the Western Railway Line and is visible from the Warrego Highway and Jondaryan-Sabine Road. The landscape surrounding the JRLF is mostly flat and contains limited vegetation, resulting in prominent views of the facility from the Warrego Highway and Jondaryan-Sabine Road. As described in **Chapter 1** and **Chapter 3**, the JRLF will be decommissioned as part of the revised Project.

Photograph 15-5 Existing Jondaryan Rail Loadout Facility

15.3.6. Visibility of Existing Environment

In order to determine the general visibility of the existing environment, it is necessary to determine the potential vantage points and the overall level of visibility from these locations. Typically, vantage points are considered as important public locations, such as roads or parks, or private locations, such as residential dwellings.

Throughout the broader landscape surrounding the revised Project site, the overall visibility of the environment is determined by the presence of vegetation and elevation. Vantage points that are elevated with limited near vegetation (refer to **Photograph 15-6**) provide for more expansive views of the landscape than vantage points at low elevations with near vegetation (refer to **Photograph 15-7**). Man-made structures within this rural environment, such as homesteads, sheds, fences and power poles are limited and do not represent a significant impediment to the overall visibility of the landscape.

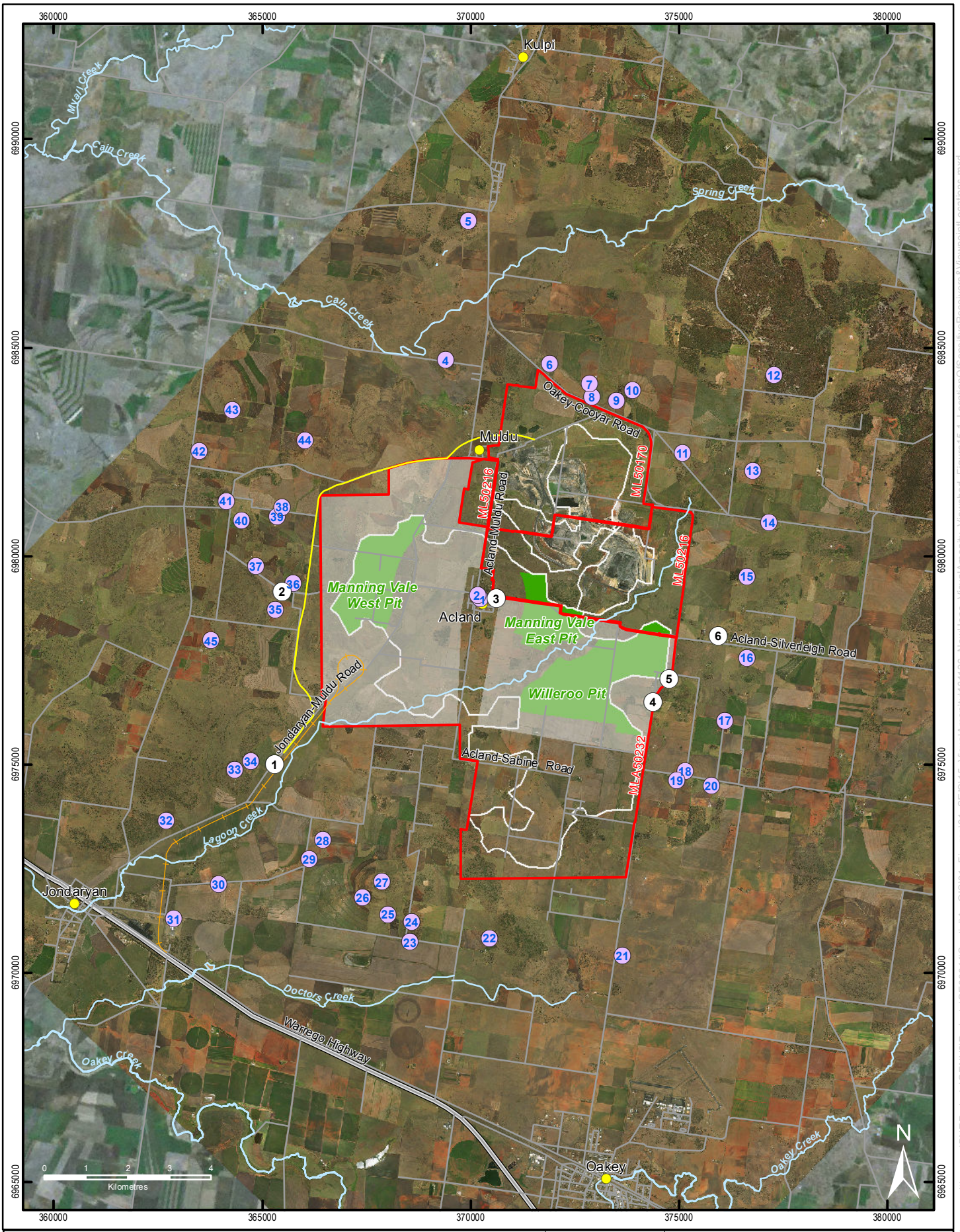
Photograph 15-6 Example of an expansive view

Photograph 15-7 Example of a limited view

Sensitive Visual Receptors

There are 44 sensitive receptors and a number of public roads within a 5 km boundary of the MLA surface rights area. Potentially impacted locations around these receptors were visited to determine if views of the revised Project were possible. Photographs were also taken from locations with potential views of the revised Project, as illustrated in **Figure 15-1**. Sensitive receptor 3 (in Muldu) has been removed from **Figure 15-1** because NAC have reached agreement to relocate the current tenant and purchase this property. The roads that were considered for this assessment included:

- Oakey-Cooyar Road;
- Acland-Silverleigh Road;
- Acland-Muldu Road;
- Acland Road;
- Jondaryan-Muldu Road;
- Childs Road;
- Jondaryan-Sabine Road;
- Peachey-Maclagan Road;
- Devon Park Road;
- Devon Park Boundary Road; and
- Hauslers Road.



LEGEND

- Towns and Localities
- View Point
- Sensitive Receptor
- Rail Spur
- Creeks
- Jondaryan-Muldu Road Diversion
- Proposed Extent of Surface Rights Area
- Mining Tenements
- Stage 3 Pit Areas

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Figure 15.1 - Location of Sensitive Receptors and Viewpoint Locations

Scale 1:120,000 on A4

Projection: Australian Geodetic Datum - Zone 56 (AGD84)

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Existing Night Lighting

Within the revised Project site, lighting is generally associated with residential homesteads. Surrounding the revised Project site, existing mining operations at the Mine provide a reasonable degree of luminance in the night sky. Residential homesteads scattered throughout the environment and the towns of Oakey and Jondaryan also contribute to night lighting within the region.

Viewshed analysis

In order to determine the general visibility of the existing environment from the identified sensitive receptors, a viewshed analysis was undertaken at four locations surrounding the revised Project site. The locations used for this assessment were chosen to provide a sample of the overall visibility of the existing environment. Viewshed analyses were conducted from the following viewpoints:

- Viewpoint location 2;
- Viewpoint location 3;
- Viewpoint location 4; and
- Viewpoint location 6.

Viewshed 1 – On Acland Road approximately 4 km west of Acland

Viewshed 1 has been conducted from viewpoint location 2 on Acland Road, approximately 4 km west of Acland, as illustrated in **Figure 15-2**. This location is situated on a higher point within the landscape and has expansive views to the south-east. From this point, the landscape slopes gradually down in a western direction towards the revised Project site and then up again where a ridgeline is located between it and the Manning Vale West resource area.

Viewshed 2 – Acland

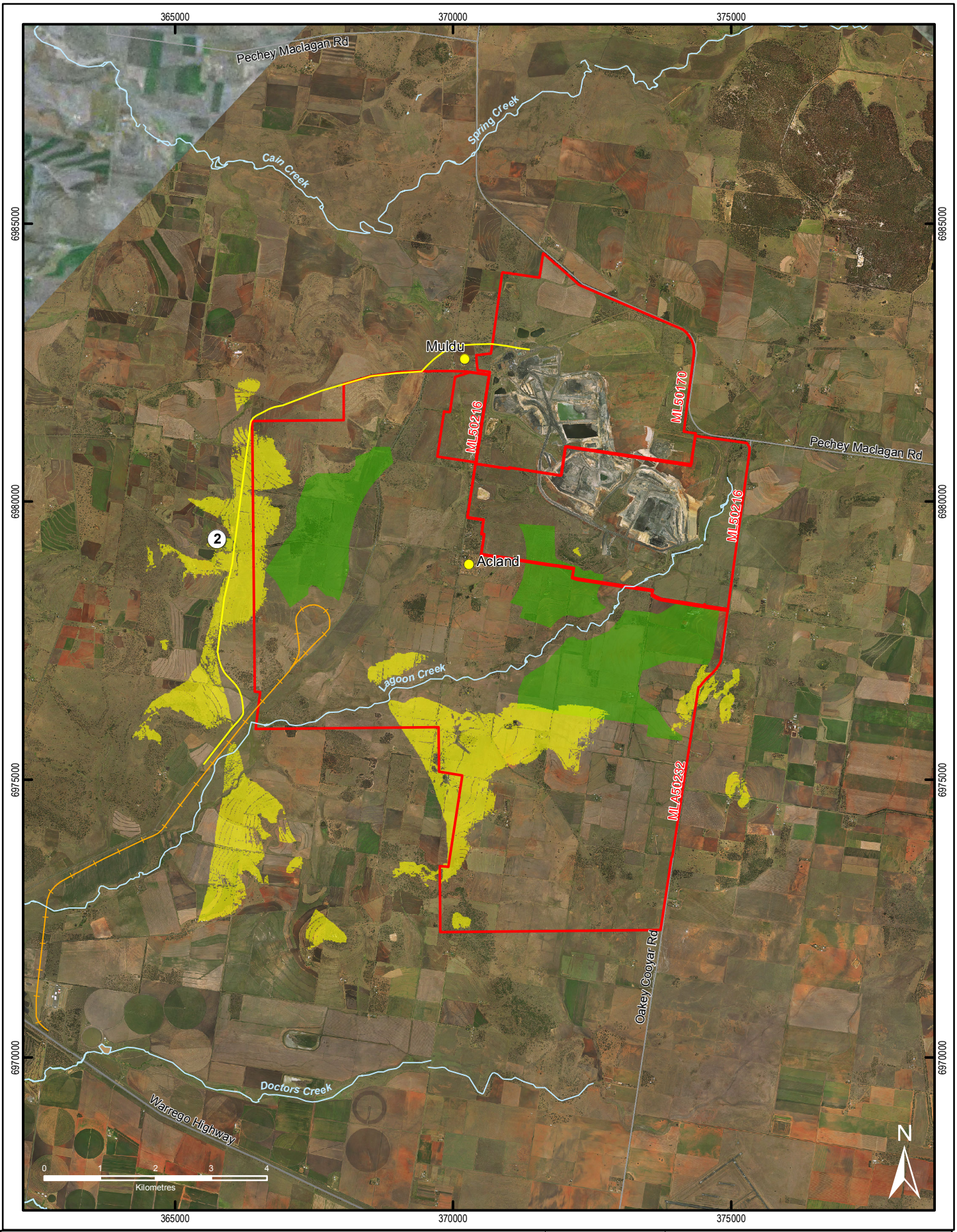
Viewshed 2 has been conducted from viewpoint location 3 within Acland, as illustrated in **Figure 15-3**. Views from Acland are generally characterised as expansive to the west and south-west and fairly limited views to the north and east due to hills and ridgelines.

Viewshed 3 – On Oakey-Cooyar Road approximately 4.2 km east south-east of Acland

Viewshed 3 has been conducted from viewpoint location 4 on Oakey-Cooyar Road approximately 4.2 km east south-east of Acland, as illustrated in **Figure 15-4**. This location is situated on a high point within the landscape and has expansive views to the north-west through to the south-east, with limited views to the north, north-east and east. From this point, the landscape slopes down in a western direction towards the Willeroo resource area.

Viewshed 4 – On Acland-Silverleigh Road approximately 5.2km east of Acland

Viewshed 4 has been conducted from viewpoint location 6 on Acland-Silverleigh Road approximately 5.2 km east of Acland, as illustrated in **Figure 15-5**. From this location, there are expansive views to the north, north-west and west. The landscape slopes down gradually in a north-western direction towards existing operations at the Mine.



LEGEND

- Towns and Localities
- (1) View Point
- Creeks
- Rail Spur
- Jondaryan-Muldu Rd Diversion
- Roads
- Mining Tenements
- Stage 3 Pit Areas
- Viewshed - Visible Area

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Figure 15.2 - Viewshed Analysis Viewpoint 2

Scale 1:90,000 on A4
Projection: Australian Geodetic Datum - Zone 56 (AGD84)

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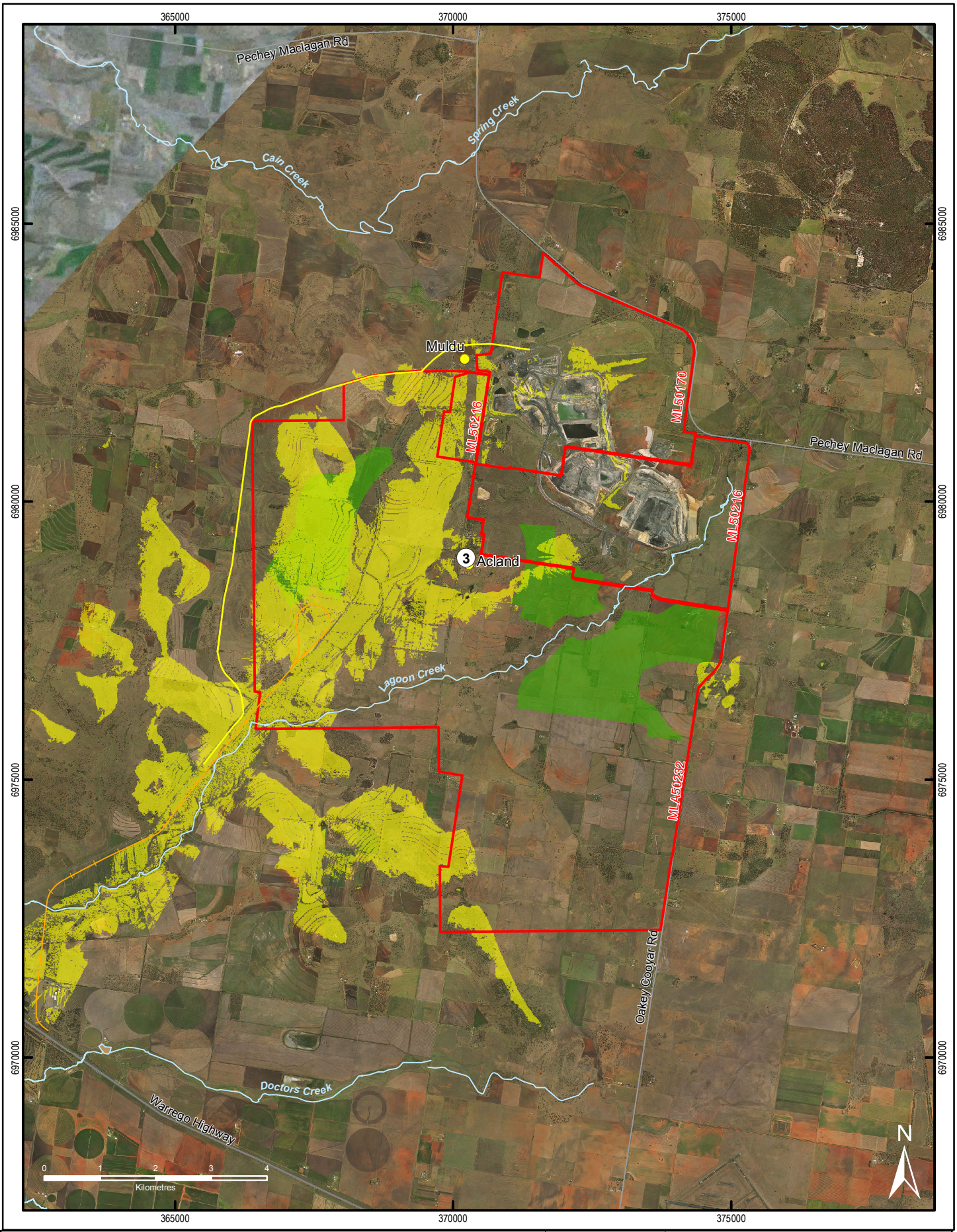

LEGEND

- Towns and Localities
- (1) View Point
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- Jondaryan-Muldu Rd Diversion
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- Stage 3 Pit Areas
- Viewshed - Visible Area

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Figure 15.3 - Viewshed Analysis Viewpoint 3

Scale 1:90,000 on A4
Projection: Australian Geodetic Datum - Zone 56 (AGD84)

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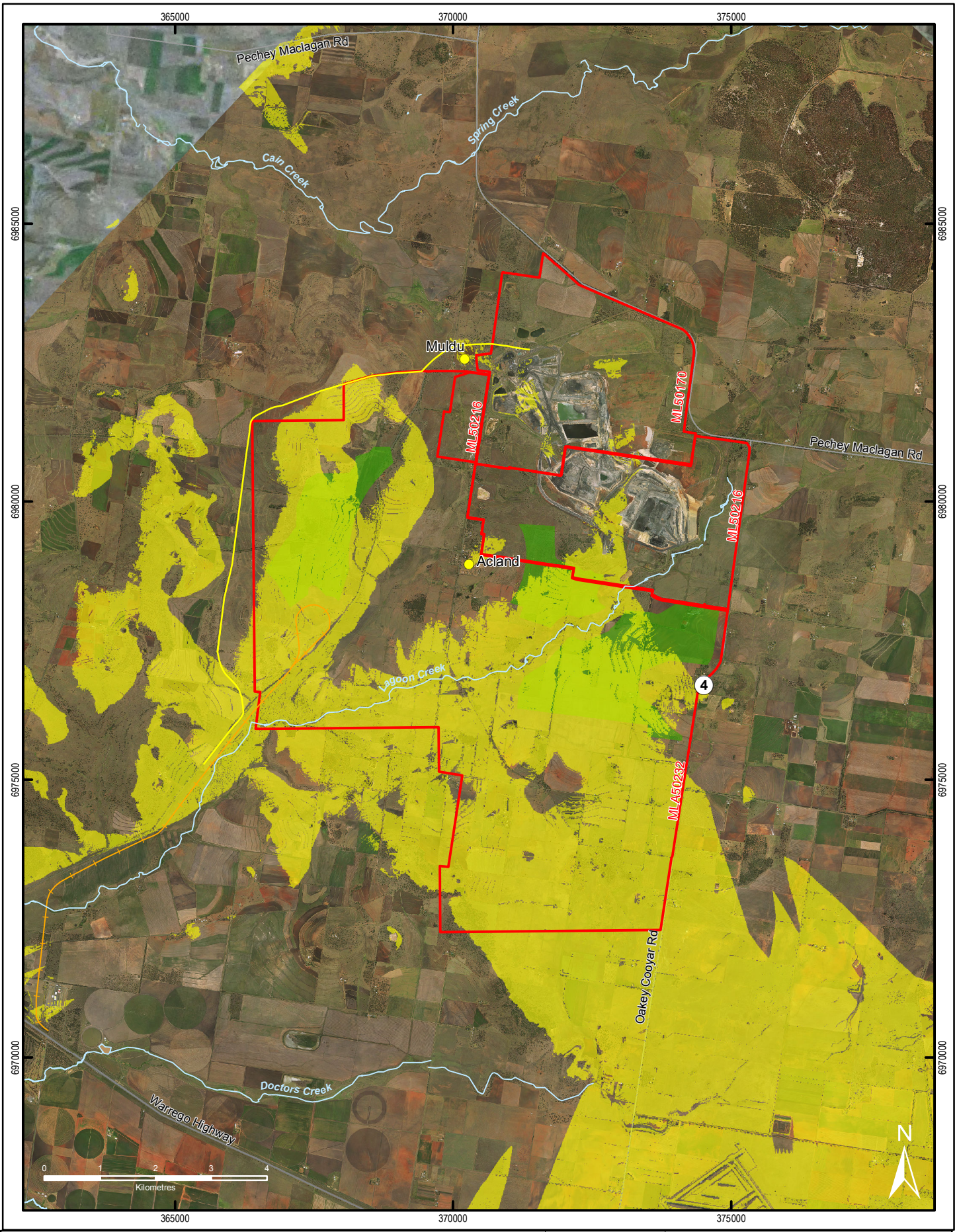

LEGEND

- Towns and Localities
- (1) View Point
- Creeks
- Rail Spur
- Jondaryan-Muldu Rd Diversion
- Roads
- Mining Tenements
- Stage 3 Pit Areas
- Viewshed - Visible Area

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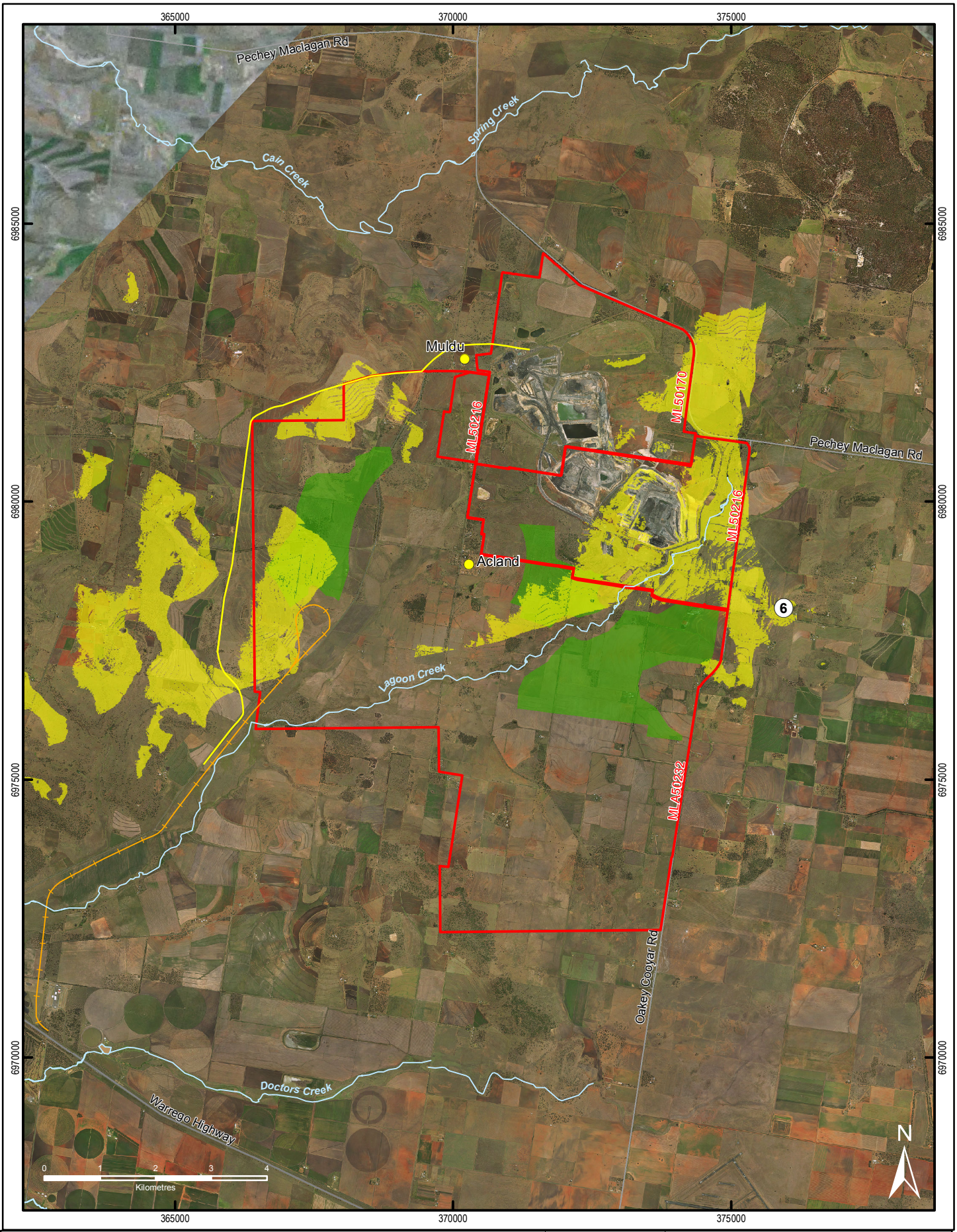
Figure 15.4 - Viewshed Analysis Viewpoint 4

Scale 1:90,000 on A4
Projection: Australian Geodetic Datum - Zone 56 (AGD84)

Produced: 22/04/2013 Path: I:\QENV2\Projects\QE06644\SpatialArcGIS\01_Figures\01_SEIS\15_VisualAmenity\130416_NewHope_VisualAmenity_Viewshed_Figure15-4_Viewpoint4.mxd



LEGEND

- Towns and Localities
- (1) View Point
- Creeks
- Rail Spur
- Jondaryan-Muldu Rd Diversion
- Roads
- Mining Tenements
- Stage 3 Pit Areas
- Viewshed - Visible Area

NEW HOPE GROUP

SINCLAIR KNIGHT MERZ SKM

NEW ACLAND COAL MINE STAGE 3 PROJECT

Figure 15.5 - Viewshed Analysis Viewpoint 6

Scale 1:90,000 on A4
Projection: Australian Geodetic Datum - Zone 56 (AGD84)

Produced: 22/04/2013 Path: I:\QENV2\Projects\QE06644\SpatialArcGIS\01_Figures\01_SEIS\15_VisualAmenity\130416_NewHope_VisualAmenity_Viewshed_Figure15-5_Viewpoint6.mxd

15.4. Impact Assessment

The likely visibility and impact of the revised Project on the surrounding landscape and in particular a number of sensitive visual receptors are considered by:

- identifying sensitive visual receptors for the revised Project;
- assessing the potential impact of night lighting from the revised Project;
- assessing visually prominent features of the revised Project; and
- assessing the visual impacts of the revised Project.

There is not expected to be any obstruction of sunlight or major reflection impacts on adjacent residential properties as a result of the revised Project. This is due to the distance and location of the adjacent residential properties in relation to the visually prominent elements of the revised Project.

15.4.1. Visually Prominent Elements of the revised Project

There are a number of elements associated with the revised Project that would be potentially visible from the key sensitive receptors. These visually prominent elements include:

- mining pit areas;
- out-of-pit spoil dumps (un-rehabilitated) and elevated landforms (rehabilitated);
- voids (un-rehabilitated) and depressed landforms (rehabilitated);
- associated infrastructure; and
- night lighting.

Mining Pit Areas

The revised Project includes three mining pit areas being the Manning Vale West, Manning Vale East and Willeroo pit areas. The location of the mine pit areas are shown in **Figure 3-1**.

The revised Project's three pit areas are planned to be partially backfilled and reshaped into depressed landforms at the end of their operational life. Throughout the expected duration of the mining activities, it is proposed that a number of sites would be excavated simultaneously. The mine pit areas will be progressively excavated, backfilled and rehabilitated over the life of the revised Project, thereby minimising the visible area of the excavation. Further information on the planned mine stages for the revised Project are discussed in **Chapter 3**.

Voids/Depressed Landforms

Not all mine pit areas will be backfilled by the end of the revised Project's mining operations. It is currently proposed that three voids will be reshaped into depressed landforms that will involve the walls of these voids being battered down to a suitable angle for grazing purposes.

The locations of these depressed landforms are as follows:

- within the southern extent of the Manning Vale West pit;
- within the southern extent of the Manning Vale East pit; and
- within the southern extent of the Willeroo pit.

Out-of-Pit Spoil Dumps/Elevated Landforms

It is proposed that three out-of-pit spoil dumps will be established adjacent each of the mining pits. The locations of the out-of-pit spoil dumps are as follows:

- adjacent to the northern boundary of the Manning Vale West pit;
- adjacent to the northern boundary of the Manning Vale East pit within the existing ML 50216; and
- adjacent to the northern-most boundary of the Willeroo pit, mostly located within the existing ML 50216.

The locations of these out-of-pit spoil dumps are shown in **Figure 3-16**. The proposed out-of-pit spoil dumps are similar in size. Although, the Manning Vale West out-of-pit spoil dump would be slightly larger.

During mining operations, out-of-pit dumping will be kept to a practical minimum and generally only carried out when a box-cut is being developed, or In-Pit Tailing Storage Facilities have displaced some of the in-pit dumping volume. Out-of-pit spoil dumps will be re-contoured and rehabilitated to elevated landforms following mining operations to reduce visible impacts and support a sustainable grazing regime consistent with the existing landscape character. **Chapter 4** provides detailed information regarding the management and location of the out-of-pit spoil dumps/elevated landforms.

Associated Infrastructure

The associated infrastructure that would be the most visually prominent includes:

- a new TLF;
- a rail spur to the TLF;
- upgrade of the existing coal handling and processing plant (CHPP) at the Mine;
- a new MHF; and
- re-alignment of Jondaryan-Muldu Road.

Assessment of the visual impacts associated with this infrastructure from various locations surrounding the revised Project site is provided in **Section 15.4.2**.

Night Lighting

The overall impact of night lighting on surrounding sensitive receptors can be determined by a number of contributing factors, including:

- proximity of nearby sensitive receptors;
- landscape topography;
- light orientation and shielding measures;
- clarity of skies (e.g., factors such as fog, smog and cloud would contribute to sky glow); and
- community perception on acceptable lighting levels.

As an open-cut mine operating 24 hour per day, substantial night lighting will be required for safe operations. Lighting will be needed to illuminate mine face work as well as associated mining infrastructure. Permanent lighting at the revised Project site will be located around infrastructure, such

as the administration blocks, the CHPP, MHF, workshops, and crib rooms and at the TLF. Temporary lights will include mobile lighting plants used to illuminate active work areas at night, such as mine pit faces, dump areas and haul roads. It is anticipated that LED lighting will be used as much as practical, for example on conveyor walkways.

15.4.2. Visual Impact Assessment

A visual impact assessment of the revised Project has been undertaken by:

- providing a conceptual graphic representation of the visual impacts on key locations through the use of photographic montages; and
- providing an assessment of the potential impact on the existing viewshed from a number of key locations.

The approximate location of the vantage points, from which each assessment has been undertaken, generally corresponds with the locations of the sensitive visual receptors shown on **Figure 15-1**.

Photographic Montage Representation

The two photographic montages, presented in **Photograph 15-8** and **Photograph 15-9**, have been developed from photographs taken from key locations around the revised Project site. The montages provide a visual representation from the viewing location prior to construction (the existing landscape) and at the end of mining operations without mitigation strategies.

Figure 15-6 and **Figure 15-7** provide a 3D visualisation of the revised Project at the time of greatest impact experienced at the viewpoints and when the revised Project has been rehabilitated.

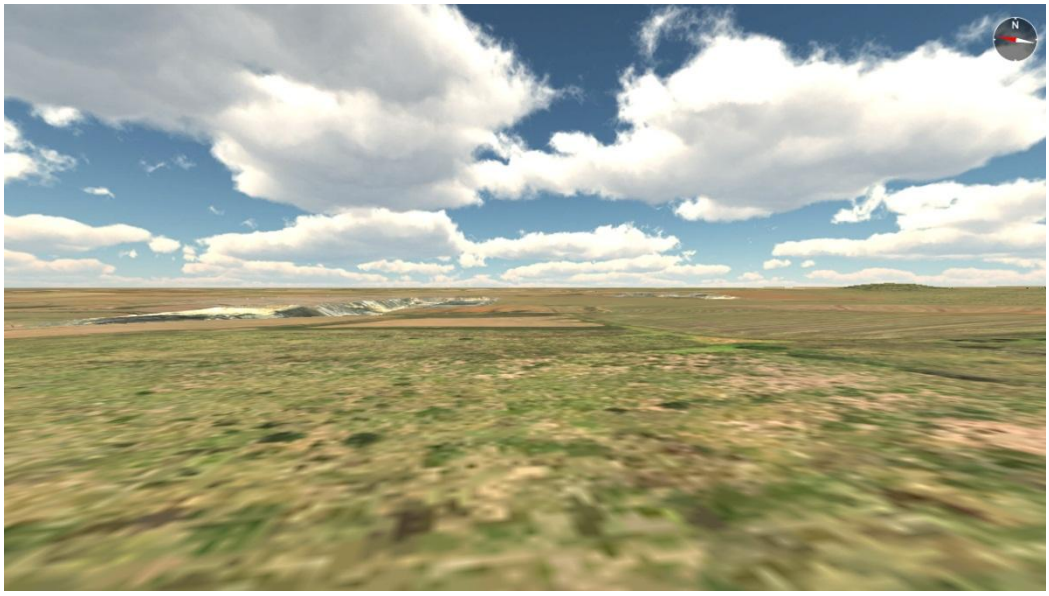
Photograph 15-8 On Oakey-Cooyar Road looking west over the revised Project

Existing Environment

Post-Mining Unmitigated View

Description The above photograph of the existing environment was taken on Oakey-Cooyar Road (Viewpoint location 4 in **Figure 15-1**) looking west over the revised Project site. From this location, there are expansive views to the west due to location of the vantage point at an elevated area of the landscape surrounding the revised Project site. There are a number of residential properties located in the vicinity of this vantage point, as shown in **Figure 15-1**.
Potential Impact The post-mining unmitigated view is an integration of the post mining landform and the existing landform without mitigation measures. From this vantage point, there will be views of mining operations at the Willeroo pit area. Extensive mining operations are proposed for the landscape visible in the photograph and it will be difficult to comprehensively mitigate the visual impact. Mining operations at the Manning Vale East pit area and the TLF would also be visible from this location. Permanent and temporary lighting associated with infrastructure and mining activities would cause an increase in night lighting within the visual environment from this location. However, the predominant sensitive receptors in this area would be passing traffic along Oakey-Cooyar Road and as such, impacts would be temporary and will therefore not be considered of substantial concern. The visibility of the proposed mining works would be reduced through the implementation of vegetative buffers along the western side of Oakey-Cooyar Road.

Greatest extent of impact of revised Project from viewpoint (2029):



Rehabilitated view:

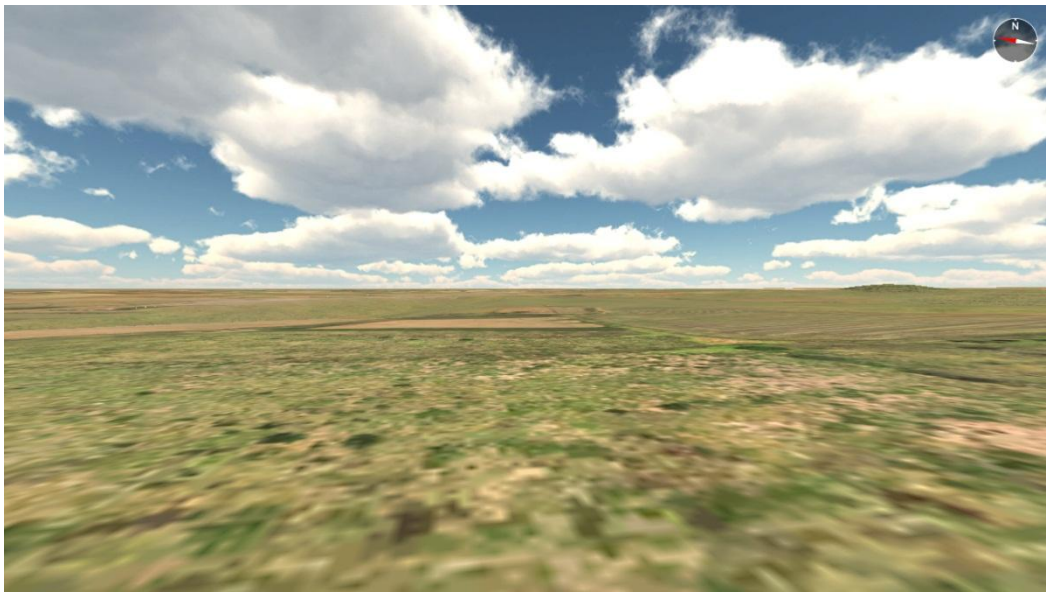


Figure 15-6 3D visualisation from Oakey-Cooyar Road looking west over the revised Project

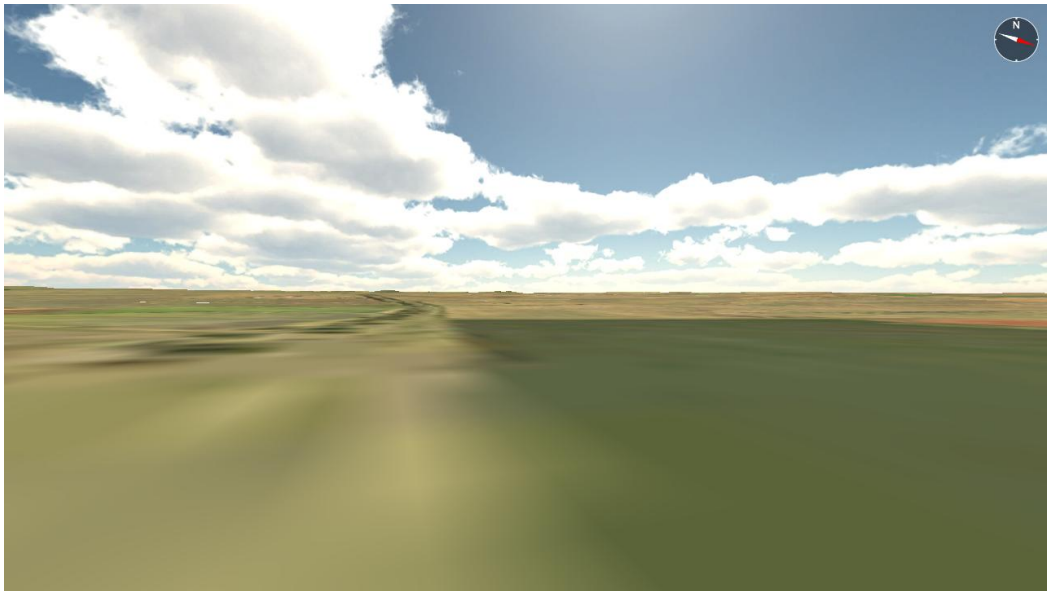
Photograph 15-9 On Acland Road looking east towards the revised Project

Existing Environment

Post-Mining Unmitigated View

Description The photograph of the existing environment was taken from Acland-Silverleigh Road looking east towards the revised Project site (Viewpoint location 2 in **Figure 15-1**). Views from this location are of predominantly cleared grazing land with remnant vegetation on elevated areas within the landscape. There is a ridge running along the western boundary of the revised Project site and established vegetation exists along the northern side of Acland-Silverleigh Road. The proposed mining lease boundary is situated approximately 700 m away from the location of the vantage point and the nearest mining activities at the Manning Vale West pit area will be approximately 850 m away. The proposed road realignment of Jondaryan-Muldu Road will be located between the vantage point location and the mining lease boundary. There are two homesteads located in the vicinity of this vantage point, as shown in **Figure 15-1**.
Potential Impact The post-mining unmitigated view is an integration of the post mining landform and the existing landform without mitigation measures. The ridge running along the western boundary of the revised Project site would limit views of the Manning Vale West pit area and much of the revised Project site. Some mining activities within this mine pit area may be visible between the year 2023 and the end of the revised Project. Following mining operations, the depressed landform at the southern extent of the Manning Vale West pit would be slightly visible from this location and would result in a permanent change to the landscape. However, this depressed landform will be rehabilitated to allow for grazing land uses. This rehabilitation method is consistent with the existing landscape character of the area. The realigned Jondaryan-Muldu Road would be a visible feature from this vantage point. It is expected that it would be similar in appearance and design to the rural roads that currently exist in the region. However, the realigned Jondaryan-Muldu Road will form the main site access road and as such, increased traffic volumes, including heavy vehicles, would result in visual impacts from this location. It is proposed that vegetated buffers are implemented along both Acland-Silverleigh Road and the new road alignment for Jondaryan-Muldu Road. This rehabilitation will limit views of the new road and associated mine traffic volumes and the proposed mining activities at the Manning Vale West pit area.

Greatest extent of impact of revised Project from viewpoint (2029):



Rehabilitated view:

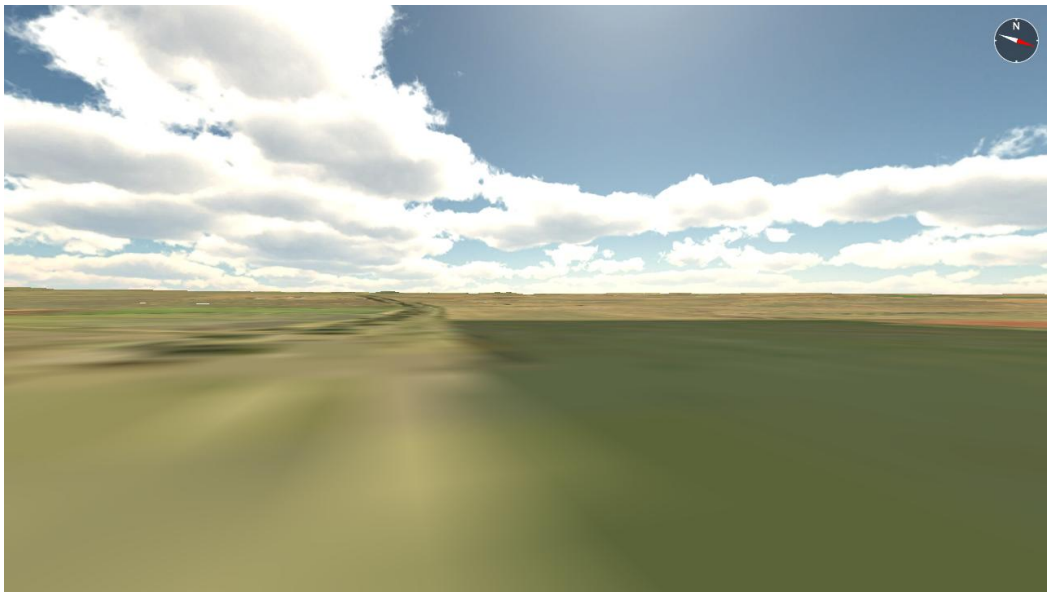


Figure 15-7 3D visualisation from Acland Road looking east towards the revised Project

Visibility Analysis

Photograph 15-10 to **Photograph 15-13** provides an assessment of the impact on the existing visual environment from a number of key locations surrounding the revised Project site.

Figure 15-8, **Figure 15-9**, **Figure 15-10** and **Figure 15-11** provide a 3D visualisation of the revised Project at the time of greatest impact experienced at the viewpoints and when the revised Project has been rehabilitated.

Photograph 15-10 On Acland-Silverleigh Road looking west towards the revised Project

GPS coordinates: 27° 18' 52.63"; 151° 44' 46.15"	**Bearing:** 280°
Viewpoint location: 6	

Description

The above photograph was taken looking west along Acland-Silverleigh Road towards the revised Project site (Viewpoint location 6 in **Figure 15-1**). The intersection of Acland-Silverleigh Road and Oakey-Cooyar Road is approximately 900 m away and lies at the top of the rise in the centre of the photograph. Bottle Tree Hill is seen within this photograph to the right of the central point. There are no residential homesteads in the vicinity of this vantage point.

The vantage point is situated on a slight rise within undulating topography which provides for expansive views to the west. However, the presence of local hills within the landscape and patches of remnant vegetation, particularly within the road reserve, provides for limited views in most other directions. The intersection of the Acland-Silverleigh Road and the Acland-Cooyar Road is located on a slight rise which provides some visual relief.

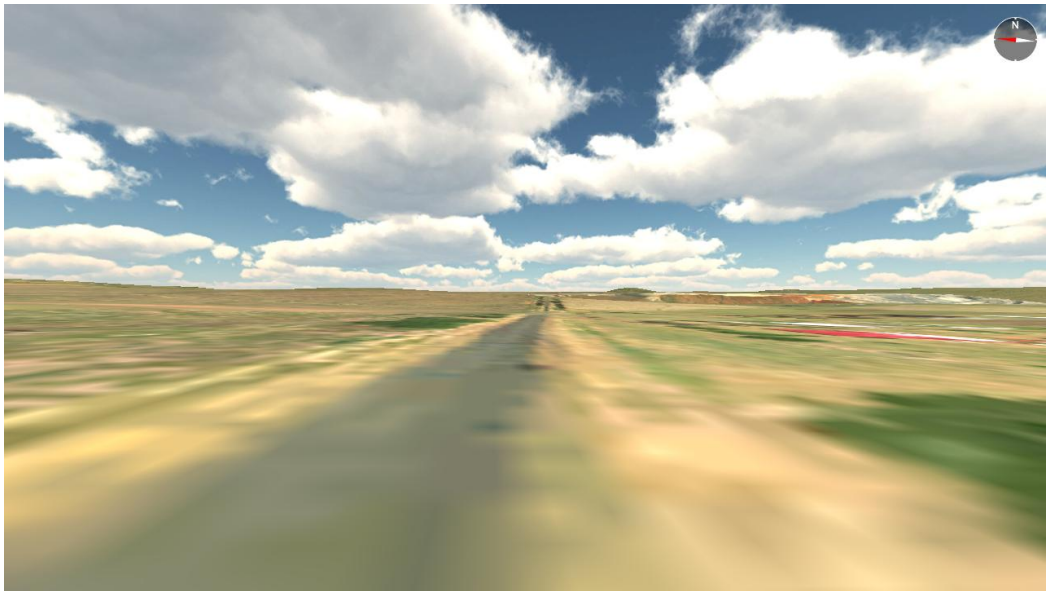
Project site visibility: ***Moderate***

From this vantage point, elements of the revised Project that would be visible during operation will be the Willeroo out-of-pit spoil dump and some mining operations associated with the Manning Vale East pit.

Remnant vegetation along the road reserves and the slight rise where the intersection of the Acland-Silverleigh Road and the Acland-Cooyar Road would aid in limiting views of the Manning Vale East pit area.

It is expected that the Willeroo out-of-pit spoil dump would be a prominent feature within the visual environment in front of Bottle Tree Hill.
Potential Impact: *Slight adverse impact* It is expected that the revised Project would have a slight adverse impact on the visual environment from this location. The Willeroo out-of-pit spoil dump would form a prominent element within the visual environment from this location during operation of the revised Project, contrasting on the existing grazing and farming character of the area. This out-of-pit spoil dump would also become a permanent feature within the visual environment following operation of the mine, altering the existing views towards Bottle Tree Hill. Although parts of the Manning Vale East pit area may be visible from this location, the undulating topography and existing patches of vegetation would obscure views and lessen the overall impact. Although there are visually prominent elements of the revised Project site from this location, sensitive receptors would be confined to vehicles travelling west along Acland-Silverleigh Road. Therefore, visual impacts experienced from this location would be temporary and considered a slight adverse impact. Furthermore, rehabilitation of the Willeroo out-of-pit spoil dump would allow for grazing land uses following mining operations. This rehabilitation method is consistent with the existing landscape character of the area.

Greatest extent of impact of revised Project from viewpoint (2019):



Rehabilitated view:

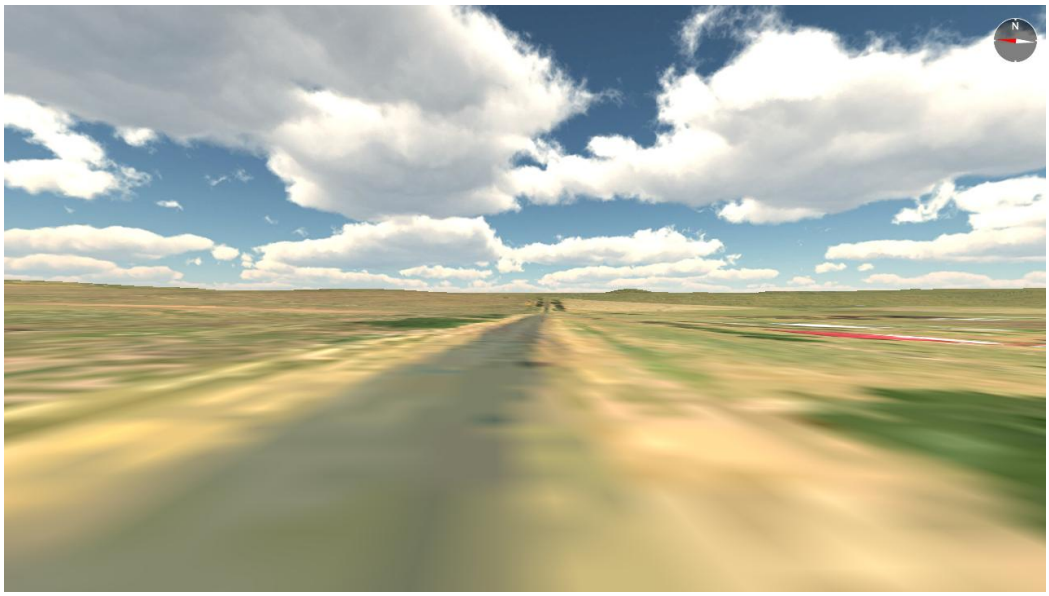
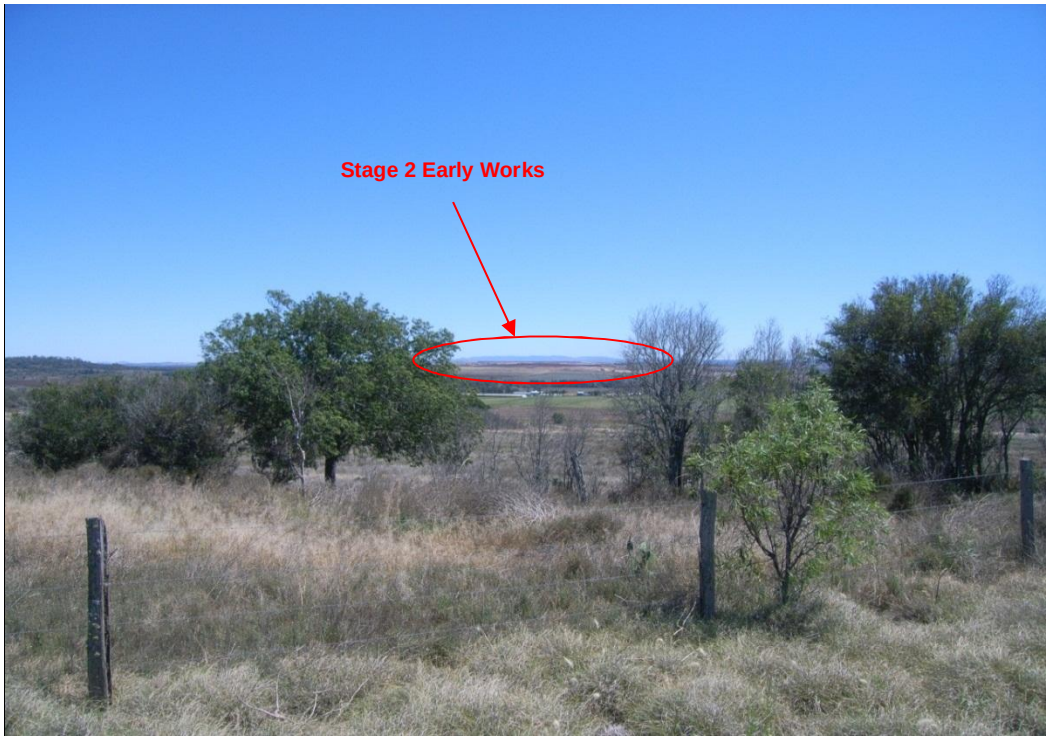


Figure 15-8 3D visualisation from Acland-Silverleigh Road looking west towards the revised Project

Photograph 15-11 On Oakey-Cooyar Road looking north-west over the revised Project



GPS coordinates: 27° 19' 25.57"; 151° 44' 2.28"	**Bearing:** 335°
Viewpoint location: 5	

Description:

The above photograph was taken from the highest point of Oakey-Cooyar Road looking north north-west towards the revised Project site (Viewpoint location 5 in **Figure 15-1**).

From this location, there are expansive views due to elevation disrupted intermittently by sporadic vegetative cover and slight rises in the landscape. Bottle Tree Hill is visible in the photograph to the left of the central line of site. Existing operations associated with the Mine are also visible from this location.

Project site visibility: *Severe*

This vantage point is located almost adjacent to the Willeroo pit area. From this location, extensive views of the Willeroo pit area will be possible and noticeable views of the Manning Vale East pit area and the Willeroo and Manning Vale East out-of-pit spoil dumps will be possible. There is some existing vegetation within the road verge of Oakey-Cooyar Road and this limits views of the revised Project in some areas.

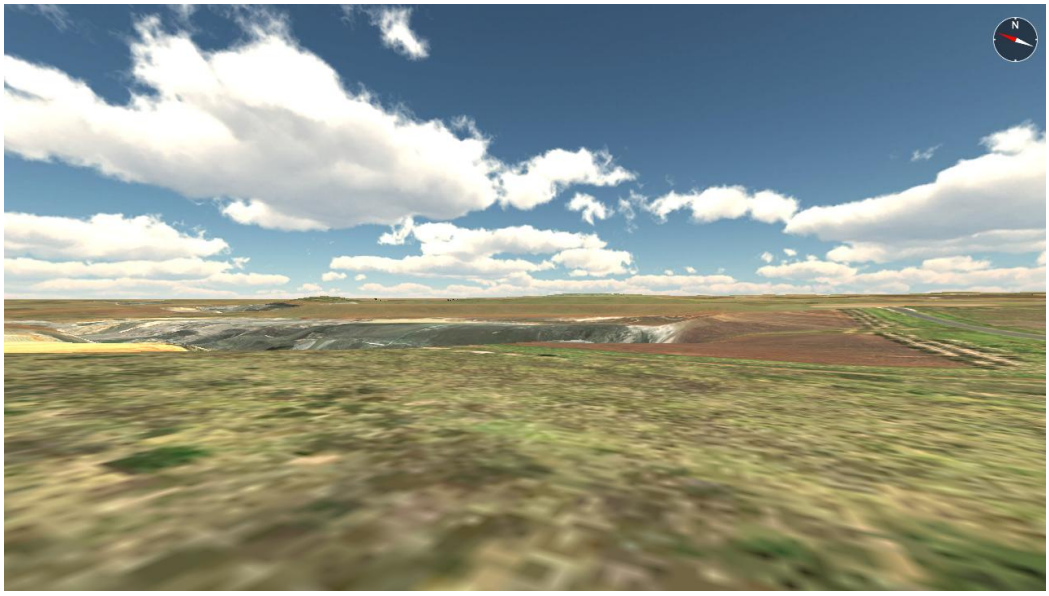
Mining activities within the Manning Vale East pit area are likely to be visible from 2015 to 2020 and within the Willeroo pit area from 2017 to 2023.

Potential Impact: ***Moderate adverse impact***

It is expected that the revised Project would have a moderate adverse impact on the visual environment from this location. Although the Willeroo pit area will be extensively visible from this location, the sensitive receptors at this location will be confined to occupants of vehicles travelling along Oakey-Cooyar Road and visual impacts would be considered temporary. There are no residential homesteads in the vicinity of this vantage point.

Furthermore, existing mining activities associated with the Mine visible from this location would offset the changes to landscape character that would be predominantly associated with the Willeroo pit area and the Willeroo out-of-pit spoil dump.

Greatest extent of impact of revised Project from viewpoint (2021):



Rehabilitated view:

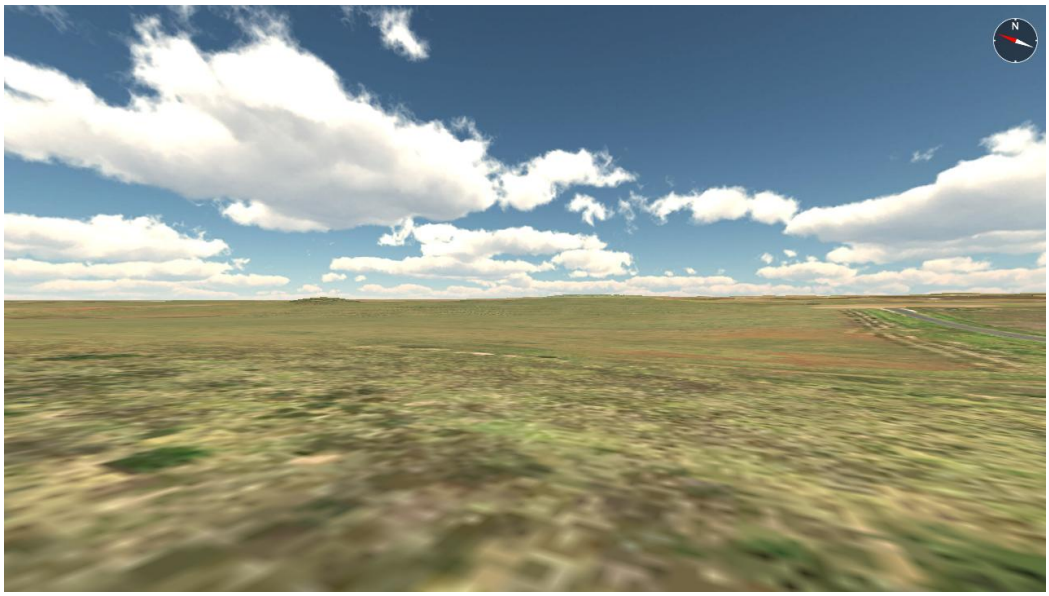


Figure 15-9 3D visualisation from Oakey-Cooyar Road looking north-west over the revised Project

Photograph 15-12 On Jondaryan-Muldu Road looking north east towards the revised Project

GPS coordinates: 27° 20' 28.12"; 151° 38' 16.47"	**Bearing:** 40°
Viewpoint location: 1	

Description:

The photograph was taken within the Jondaryan-Muldu Road reserve (Viewpoint location 1 in **Figure 15-1**) looking north-east towards the proposed site for the TLF. From this location, there are expansive views to the north-east and Bottle Tree Hill is visible approximately 8 km away. However, the topography slopes slightly upwards in a north-easterly direction from this point and there are numerous patches of remnant vegetation on higher parts within the landscape.

There is one residential homestead in the vicinity of this viewpoint location, approximately 400 m to the west.

Project site visibility: ***Moderate***

The new rail spur will be constructed adjacent the eastern side of Jondaryan-Muldu Road and would form a new element within the visual environment from this location. The road will be realigned to the west to be located outside of the revised Project site.

The slight rise in topography towards the north-east and the presence of patches of vegetation would limit views of the TLF. However, permanent lighting will be located at the TLF and this would result in a glow within the night sky.

Construction activities for the rail spur to the TLF and the re-alignment of Jondaryan-Muldu Road will occur between 2015 and 2017.

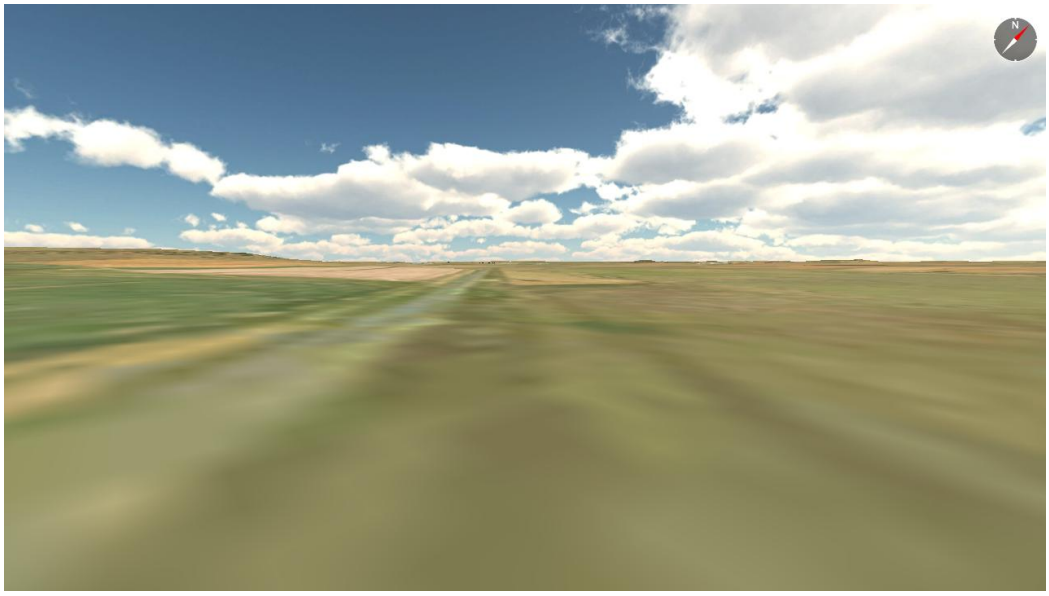
Potential Impact: ***Slight adverse impact***

It is considered that the revised Project would result in a slight deterioration of the existing visual environment from this location. The visible components of the rail spur would only interfere with a small area on an otherwise expansive visual landscape. The re-alignment of Jondaryan-Muldu Road is unlikely to result in a noticeable change to the visual environment from this location.

Visual impacts associated with the rail spur and re-alignment to Jondaryan-Muldu Road would be mostly experienced during 2015 and 2017 while this infrastructure is being constructed.

Although the topography and patches of vegetation would limit views of the TLF, permanent lighting at this facility would result in an increased night time glow within the local visual environment. This is because there are limited light sources located near to the proposed location of the TLF.

Greatest extent of impact of revised Project from viewpoint (2019):



Rehabilitated view:

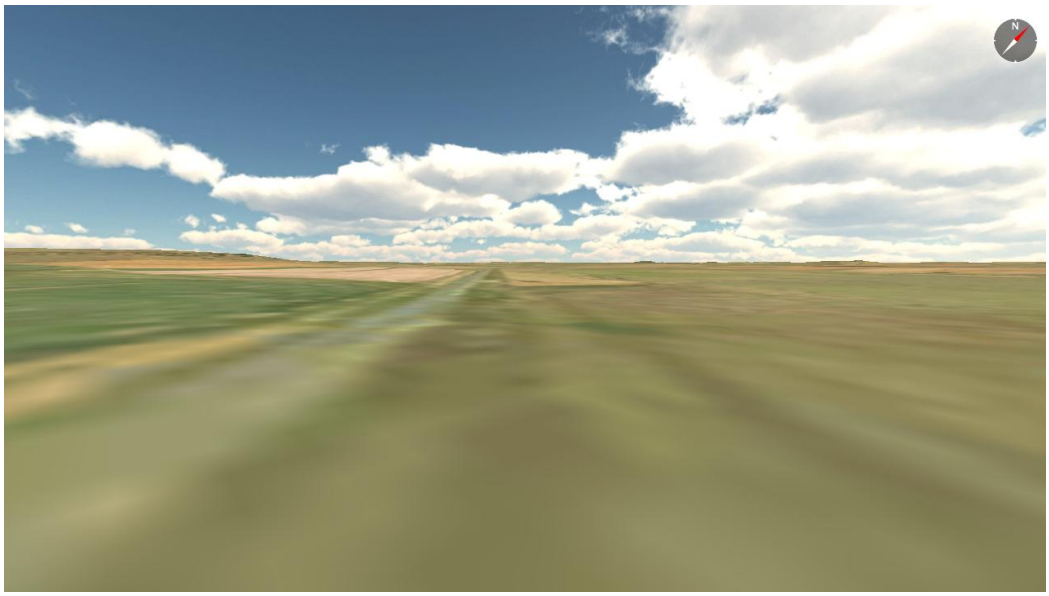


Figure 15-10 3D visualisation from Jondaryan-Muldu Road looking north east towards the revised Project

Photograph 15-13 From Acland looking east towards the revised Project

GPS coordinates: 27^{o} 18’ 15”; 151^{o} 41’ 35”	**Bearing: 90^{o}**
Viewpoint location: 3	

Description:

The photograph was taken from William Street on the edge of the Acland (Viewpoint location 3 in **Figure 15-1**) looking east towards the proposed Manning Vale East pit area. Acland has been considered as a sensitive receiver from this viewpoint location for the purposes of this assessment.

From this location expansive views are limited by the presence of established vegetation dominating the horizon and along Acland Road and the upwardly sloping topography towards the east. Bottle Tree Hill is visible to the left of the central point of the photograph.

Project site visibility: *Moderate*

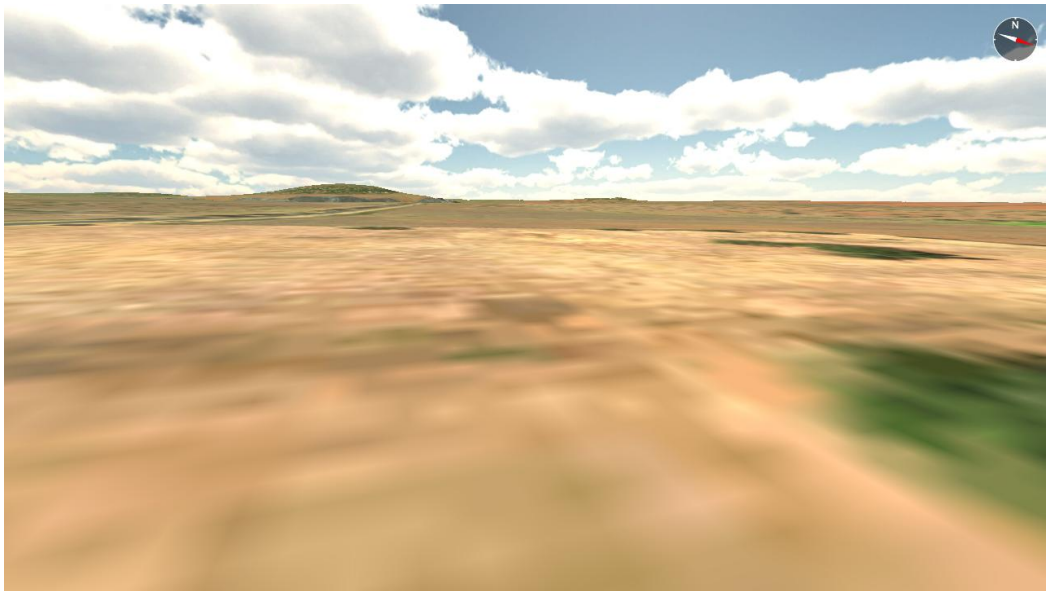
From this location, the revised Project would form a visible and recognisable new element within the visual environment. The Manning Vale East pit area will be located approximately 600 m away and would be visible. The top of the Willeroo out-of-pit spoil dump may also be visible. Existing vegetation surrounding Bottle Tree Hill and within the road reserve of Acland Road would help to obscure views of mining activities.

Mining activities at the Manning Vale East pit area would be most visible between 2019 and 2029. Following mining activities, the depressed land form that will remain at the southern extent of the Manning Vale East pit area would also be visible from this location.

Potential Impact: ***Moderate adverse impact***

It is expected that the revised Project would result in a moderate change to the existing visual environment and character of the township. The removal of vegetation to establish the Manning Vale East pit would result in a noticeable change to the visual environment. Removal of this established vegetation may also allow for views of the Willeroo out-of-pit spoil dump. Mining operations within the mine pit area would also alter the topography of the existing rise to the east. However, the overall impact of the revised Project would be offset by the presence of existing mining activities located to the north-east of this viewpoint. Vegetation within the road reserve of Acland Road would also aid to obstruct views of mining activities.

Greatest extent of impact of revised Project from viewpoint (2023):



Rehabilitated view:

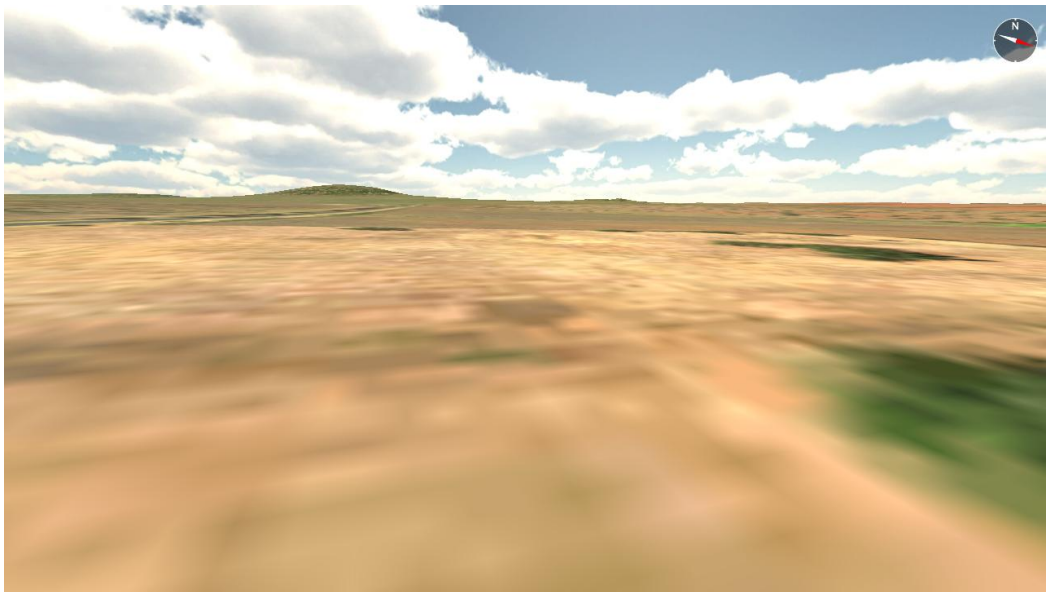


Figure 15-11 3D visualisation from Acland looking east towards the revised Project

Summary of Visual Impacts

Through the clearing of vegetation, the excavation of the mine pit areas and the establishment of out-of-pit spoil dumps, the revised Project will alter the local visual environment and landscape character throughout the life of the mining operations.

During construction, operation and decommissioning of the revised Project, aspects that would be most visible from the nearby sensitive receptors include:

- out-of-pit spoil dumps;
- mine pit areas and voids located close to the boundaries of the revised Project site and the sensitive receptors;
- the rail spur and TLF;
- the MHF; and
- the realignment of Jondaryan-Muldu Road.

The relatively undulating topography surrounding the revised Project site provides for both expansive and limited views. Although, some higher points within the landscape provide for significant views of the revised Project, the presence of vegetation on localised hills and ridgelines limits views from other vantage points.

Motorists travelling along Oakey-Cooyar Road would have extensive views of the mine pit areas and out-of-pit spoil dumps due to both the expansive views to the west from this road and its proximity to the revised Project site.

Acland is expected to experience visual impacts due to both the proximity of the revised Project and expansive views to the west.

Visual impacts on the western side of the revised Project site would generally be confined to the rail spur and re-alignment of Jondaryan-Muldu Road. A ridgeline running along the western boundary of the revised Project site would limit views of mining activities.

Sensitive receptors located to the north and north-east of the revised Project site are expected to experience limited visual impacts due to the fact that existing operations at the Mine would offset impacts. Rehabilitation such as re-vegetation, has occurred in these areas, limiting views of the existing mining activities.

Due to the rural landscape within and surrounding the revised Project site, night lighting is expected to create a glow in the night sky that will be visible from the surrounding region and nearby residences. Permanent lighting around the CHPP precinct, MHF, TLF and mining areas will contribute to a general glow in the night sky, as well as in-pit machinery, mobile equipment and mining vehicles. Lighting for the revised Project has the potential to cause impacts to the operations of the Oakey Airbase and Training Centre. The Aviation Hazard Management located in **Appendix J.17** outlines the mitigation measures that will be implemented for the revised Project.

However, as the Mine already provides some luminance in the night sky, it is unlikely that the revised Project will substantially increase the existing visual impact of night time glow. The CHPP will be upgraded at its current location and as such, only slight changes in night lighting would be experienced. Furthermore, the light emitted from the new TLF area is expected to be reduced by comparison to the current JRLF.

The impacts on fauna from night lighting are expected to be minimal due to the location and extent of remnant vegetation. Impacts of the revised Project on flora and fauna are discussed further in **Chapter 7**.

NAC will address concerns from near neighbours regarding directional lighting issues from mobile lighting units. NAC has prepared a Local Stakeholder Management Plan (LSMP) which outlines procedures to address concerns from near neighbours. The LSMP is provided in **Appendix J.18**.

15.5. Mitigation Measures

This Section provides a description of the mitigation measures proposed to minimise visual impacts of the revised Project. The mitigation measures that will be undertaken to reduce the likely visibility or visual impact from key locations surrounding the revised Project site are listed in **Table 15-5**.

Table 15-5 Scenic Values – Mitigation Measures

Issue	Response – Mitigation Measures
Retention of Existing Vegetation	The retention where practical, of existing roadside and fence line vegetation will assist in partially screening elements of the revised Project and may assist in limiting expansive views of these activities. This action will be considered at the following locations: ■ Oakey-Cooyar Road (along the western side of the road); ■ Jondaryan-Muldu Road (along the eastern side of the road); ■ Acland-Silverleigh Road (along the northern and southern sides of the road; and ■ Within and surrounding Acland.
Completion of Tree Screening Activities	NAC undertook tree planting activities during February 2005 and a total of 2,500 trees were planted at a rate of approximately one tree every 2 m. The tree species used were *Eucalyptus argophloia* (Chinchilla white gum), *Eucalyptus poplunea* (Poplar box) and *Casuarina cristata* (Belah). New tree-screening activities will occur: ■ along the western side of Oakey-Cooyar Road to minimise expansive views of the revised Project site to the east; ■ along the western side of the re-aligned section of Jondaryan-Muldu Road to limit views of mining vehicle traffic; ■ along both the eastern and western sides of Jondaryan-Muldu Road south-west of the revised Project site to limit views of the rail spur and mining vehicle traffic; and ■ on the eastern and western edges of Acland to preserve the character of the town. Other areas of tree-screening activities surrounding the revised Project site may be appropriate, such as around individual residential homesteads and within Acland. This would be identified through consultation with individual landholders impacted by the revised Project.

Issue	Response – Mitigation Measures
Night lighting	Lighting on the revised Project site will be oriented inwards and screened from the outside where possible. NAC will implement the Aviation Hazard Management Plan. Night lighting with be located as required for safety and security, but focussed on the areas required, with shields around the globes to limit extraneous light where necessary. NAC will implement the LSMP.
Rehabilitation of the Project site	Rehabilitation will be carried out progressively. The provision of vegetation to the disturbed areas of the revised Project, including the out-of-pit spoil dumps, backfilled areas and depressed landforms, will ensure that the visual environment is returned, as much as possible, to its predominately rural outlook.
Establishment of Visual Buffers	The establishment of elevated bunds between the revised Project and sensitive receptors may be implemented to reduce the overall visibility of the revised Project. Mitigation strategies that were implemented for the Mine (refer to **Photograph 15-3**) will be incorporated along Oakey-Cooyar Road and the re-aligned section of Jondaryan-Muldu Road. These barriers may be established during the initial stages of the revised Project's early works and would be established from overburden spoil and done concurrently with the tree screening activities. However, in establishing these buffers, it will be necessary to consider the potential impacts from these features on the visual environment. Elevated bunds should only be implemented in areas where limited views are currently provided or where mining activities are located very near to roadsides and could present as a distraction to vehicle occupants.
Further identification of impacts	As required, residences will be consulted with in order to determine if future perceived impacts require mitigation; and if so, discuss what form of mitigation is acceptable. For example, a tree screen at the back of a house to completely screen the views of the mine expansion areas is an option.

15.6. Conclusion

The undulating nature of the Study area generally provides for extensive views of a predominately rural landscape with a medium degree of visual amenity. Apart from the Mine, the revised Project site is dominated by interspersed vegetated landscapes with unobtrusive residential developments.

The Mine is a visually prominent feature within the existing landscape. However, through the implementation of the mitigation measures listed in **Table 15-5**, views of mining operations for the revised Project from sensitive receptors would be limited.

In its initial stages, the revised Project would be a visually prominent feature within the landscape and, to an extent, will conflict with the existing nature of the visual environment. The nature of the works will initially alter the existing visual environment through excavation of a predominately rural landscape and the removal of vegetation.

As is common with the broader region, residential dwellings surrounding the revised Project site are sparsely located and it is considered that approximately eight of the 44 sensitive receptors would have an expansive view of the various works being undertaken for the revised Project, as presented in **Figure 15-2** to **Figure 15-5**. Primarily, traffic on Oakey-Cooyar would have the highest level of visibility over the revised Project site. However, as the traffic is considered as a temporary receptor, impacts are considered to be minor. Sensitive receptors within Acland would also have views of the revised Project site due to its proximity, but suitable mitigation measures such as vegetation screening will minimise visual impacts.

The establishment of visual buffers around the revised Project site, particularly along Oakey-Cooyar and Jondaryan-Muldu Roads and at appropriate locations within Acland, will limit views of the revised Project and ensure that the region retains its predominately rural outlook.

Post-operation of the revised Project, the elevated and depressed land forms will be re-vegetated and returned to a relatively natural form to allow for grazing land uses. In the long-term, it is expected that impacts from the revised Project on the visual landscape will be negligible as the peaks and dips associated with the elevated and depressed land forms will be similar to the undulating topography that is common throughout the broader, regional landscape.

15.7. Summary of mitigation measures and commitments

Table 15-6 provides a summary of the mitigation measure and commitments for the revised Project.

Table 15-6 Summary of Mitigation Measures and Commitments

Mitigation measure	Commitment
Retention of Existing Vegetation	Retention of existing roadside and fence line vegetation at the following locations: ■ Oakey-Cooyar Road (along the western side of the road); ■ Jondaryan-Muldu Road (along the eastern side of the road); ■ Acland-Silverleigh Road (along the northern and southern sides of the road; and ■ Within and surrounding Acland.
Completion of Tree Screening Activities	Tree-screening activities will occur: ■ along the western side of Oakey-Cooyar Road to minimise expansive views of the revised Project site to the east; ■ along the western side of the re-aligned section of Jondaryan-Muldu Road to limit views of mining vehicle traffic; ■ along both the eastern and western sides of Jondaryan-Muldu Road south-west of the revised Project site to limit views of the rail spur and mining vehicle traffic; and ■ on the eastern and western edges of Acland. Consultation with individual landholders impacted by the revised Project to identify other areas of tree-screening activities

Mitigation measure	Commitment
	surrounding the revised Project site.
Night lighting	Lighting on the revised Project site will be oriented inwards and screened from the outside where possible. Consultation with Oakey Airbase and Training Centre will continue as part of the implementation and operation of the Aviation Hazard Management Plan.
Rehabilitation of the revised Project site	Rehabilitation will be carried out progressively. The provision of vegetation to the excavated sites, including the out-of-pit spoil dumps, backfilled areas and depressed land forms, will ensure that the site is returned, as much as possible, to its predominately rural outlook.
Establishment of Visual Buffers	The establishment of elevated bunds between the revised Project site and the sensitive receptors may be implemented to reduce the overall visibility of the revised Project. Mitigation strategies that were implemented for the Mine could be incorporated along Oakey-Cooyar Road and the re-aligned section of Jondaryan-Muldu Road. Elevated bunds should only be implemented in areas where limited views are currently provided or where mining activities are located very near to roadsides and could present as a distraction to vehicle occupants.
Further identification of impacts	Residences will be consulted with in order to determine if future perceived impacts require mitigation; and if so, discuss what form of mitigation is acceptable. For example, a tree screen at the back of a house to completely screen the views of the mine expansion areas is an option.