CopperString 2.0

# Visual amenity

Volume 3 Appendix O

IRIS Visual Planning + Design

# CopperString

## Landscape and visual impact assessment

for GHD on behalf of CuString

November 2020

# 1.0 Introduction

The 'Terms of Reference' for the CopperString Project, prepared by the Coordinator-General, and issued in September of 2019 includes the following objectives and assessment requirements:

### Objectives

*Development should be designed and operated to:*

*(a) minimise impacts on the environment and improve environmental outcomes*

*(b) protect the environmental values of land including soils, subsoils, landforms and associated flora and fauna*

*(c) contribute to community wellbeing*

*(d) contribute to strong and balanced social, economic, cultural and environmental sustainability.*

### Impact assessment and mitigation measures

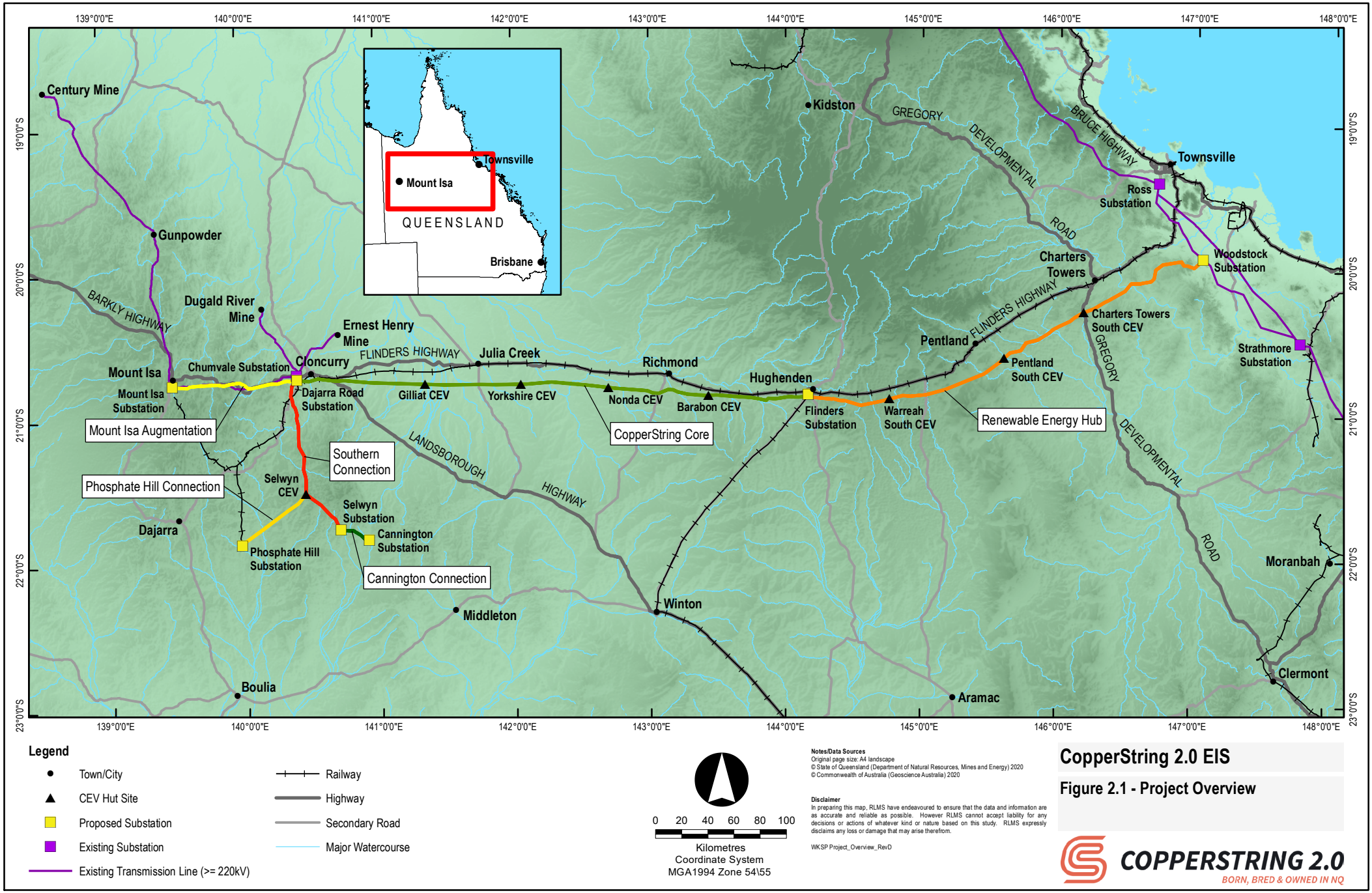
*12.9 Describe the visual impact of the Project on communities, particularly those living in townships and urban areas. Describe the proposed mitigation measures that would be used to avoid or minimise impacts.*

# 2.0 Purpose of report

This report has been prepared on behalf of the proponent, CuString Pty Ltd (CuString) as a technical study to support an Environmental Impact Statement for the CopperString 2.0 EIS Project (the Project). The Project is a proposed electricity transmission network running generally between Townsville and Mount Isa in Northern Queensland. Figure 2.1 shows the proposed corridor selection of the transmission line.

The Project is about 1,000 km of transmission line located within an easement of between 60 and 120 m wide and seven substations. The Project would require a temporary footprint to accommodate construction and construction support facilities including site offices, laydown areas and worker accommodation camps.

The purpose of this study is to provide a landscape and visual impact assessment of the Project proposed by CuString, between Mount Isa and Townsville.

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# CopperString 2.0 EIS

## Figure 2.1 - Project Overview

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# 3.0 Methodology

## 3.1. Guidance for Visual Impact Assessment

A range of guidance is available for the assessment of landscape and visual impact. However, the industry typically refers to the guidance offered by the Australian Institute of Landscape Architects as well as the Landscape Institute in the United Kingdom, which are:

- *The Guidance Note for Landscape and Visual Assessment* (GNLVA), Australian Institute of Landscape Architects Queensland, 2018.
- *The Guidelines for Landscape and Visual Impact Assessment* (GLVIA), Third Edition, Landscape Institute and Institute of Environmental Management and Assessment, 2013.

The methodology used for this Project is described in Section 1.3.2 and conforms with the direction offered by both documents.

## 3.2. Approach

### 3.2.1. Existing Visual Conditions

Site inspections were carried out during March of 2020.

The inspection considered a 5 km radius either side of the proposed transmission line (the Study Area) as well as a wider area within a 12 km radius (the study area).

This evaluation allowed the team to specifically identify locations that were representative of views to the site, and thus consider locations which are likely to be subject to visual impacts from the proposed development. In order to appreciate the baseline condition, a series of representative viewpoints have been selected to comprehensively illustrate the visual influence of the site. These views represent publicly accessible viewpoints from a range of locations and viewing situations. Particular attention was paid to designated viewing locations and tourist routes, where a larger number of viewers are expected to congregate. Photomontages were developed for some vantage points demonstrate the expected change.

### 3.2.2. Assessment of Visual Impact

The assessment of visual impact is based on the identification of the magnitude of impact (change) level created by the Project, and the sensitivity of the viewer. Combined, these characteristics of the view are then considered to assign a level of likely visual impact. This methodology is explained more fully in the following paragraphs.

#### *Magnitude of change*

The magnitude of change refers to the change to the view that would occur as a result of development from a given viewpoint. This includes what has changed, and how it has changed. The magnitude of change describes the extent of change and identifies elements which are removed or added, changed in colour and texture, and compatibility of new elements with the existing view. These changes can result in an improvement or reduction in visual amenity.

A high magnitude of change will result if the development contrasts strongly with the existing landscape.

A low magnitude of change occurs if there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the environment in which it sits. In this situation the development may be noticeable, but does not markedly contrast with the existing modified landscape.

Table 3.1 lists the terminology used to describe the magnitude of change level.

TABLE 3.1 VISUAL MAGNITUDE

| Visual magnitude of change | Description |
|---|---|
| Extreme | The entire view is altered in a way that contrasts with the surrounding landscape so that the integrity and quality of the view is transformed. |
| High | Substantial part of the view is altered and contrasts with the surrounding landscape. |
| Moderate | Alteration to the view is clearly visible and contrasts with the surrounding landscape. |
| Low | Alteration to the view is clearly visible but does not contrast with the surrounding landscape. |
| Negligible | Either the development is not visible, or if it is, the change in the view is compatible with the surrounding landscape. |

*Visual Sensitivity*

Visual sensitivity refers to the nature and duration of views. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity. Distance also contributes to the sensitivity of a view. Generally, the greater the distance, the less sensitive the viewpoint.

The following terminology is used to describe the level of visual sensitivity, see Table 3.2.

TABLE 3.2 VISUAL SENSITIVITY TABLE

| Visual Sensitivity | Description |
|---|---|
| Very high | View of international importance or recognition, these are extremely rare and irreplaceable. |
| High | Heavily experienced view to a national icon or an extremely rare view, e.g. view to Sydney Opera House from Circular Quay, view to Parliament House Canberra along Anzac Parade. |
| Moderate | Heavily experienced view to a feature or landscape that is iconic to the state / region / province and/or somewhat rare, e.g. views of Magnetic Island from Castle Hill in Townsville, an important view from an area of regional open space. e.g. a view to Castle Hill from the strand in Townsville, or a view from a lookout to a regionally distinctive mountain range or water body. |
| Low | High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users. e.g. views from a scenic route or local lookout. |
| Minimal | Views where visual amenity is not particularly important to the wider community, such as lower quality views briefly glimpsed from roads. |

*Visual Impact*

The visual impact for each representative viewpoint has been assessed and a significance of visual impact assigned. The following significance criteria have been developed specifically for this Project to allow for this consistency to occur. Refer to Table 3.3.

TABLE 3.3 SIGNIFICANCE OF VISUAL IMPACT

| | | Magnitude of impact | | | | |
|---|---|---|---|---|---|---|
| | | **Extreme** | **High** | **Moderate** | **Low** | **Negligible** |
| **Visual sensitivity** | **Very high** | Very high | Very high | High | Moderate | Negligible |
| | **High** | Very high | High | High | Minor | Negligible |
| | **Moderate** | High | High | Moderate | Low | Negligible |
| | **Low** | Moderate | Moderate | Low | Low | Negligible |
| | **Minimal** | Low | Low | Negligible | Negligible | Negligible |

*Mitigation and Residual Effects*

For those areas identified as likely to result in a visual impact, as a result of the Project, methods for reducing these impacts have been considered and specific mitigation approaches recommended. These mitigation techniques may include the use of vegetation for screening, reducing the size of towers, adjustments in the location of towers, and tower spacing for example. Incorporating these proposed mitigation approaches into the assessment, impacts of specific viewpoints are then re-assessed and the residual effects of the Project can then be identified.

*Cumulative and Interactive Effects*

Incorporating cumulative effects into the impact assessment widens the assessment to include not only direct effects, but also collective effects.

Cumulative effects of projects can indicate that the combination of effects created by multiple projects may be greater than the sum of the individual effects. Cumulative impacts between projects will be addressed based on assumptions about the likely implementation of proposed projects within neighbouring areas.

# 4.0 Character and components of the Project

The Project would include:

- transmission line with galvanised steel lattice (or single pole) transmission towers ranging in height from 35 m to 75 m tall, between 5 m to 14 m wide at the base and spaced at between 300 and 500 m apart.
- It is not anticipated towers of 75 m in height will be utilised extensively through the Project and will mostly be used in sites where large spans are required (e.g. major river crossings).
- There will beseven new substations.
- Access tracks for construction and ongoing maintenance along the easement, where possible.

Where a 120 m easement has been allocated, only 60 m on one side of the 120 m easement will be utilised as a part of this Project. The remaining 60 m will be acquired for any future line duplication which would be subject to a separate environmental assessment process.

The corridor sections, shown in Figure 2-1, are described in Table 4.1 and examples of typical towers and single poles are shown in Figure 4.1.

FIGURE 4-1: TYPICAL 132KV DOUBLE CIRCUIT STEEL LATTICE TRANSMISSION TOWER (LEFT) AND TYPICAL 132KV DOUBLE CIRCUIT SINGLE POLE (RIGHT)

TABLE 4.1 TRANSMISSION LINE SECTION AND TOWER DESCRIPTION

| Transmission line section | Easement width (m) | Distance (km) | Voltage (kV) | Height (m) | Typical Spacing(m) |
|---|---|---|---|---|---|
| Renewable Energy Hub | 120 | 311 | 330 | 50-75 | 450 – 500 |
| Copperstring Core | 120 | 420 | 330 | 50-75 | 400 – 450 |
| Mount Isa Augmentation | 60 | 99 | 220 | 45-70 | 400 – 450 |
| Southern Connection | 60 | 90 | 220 | 45-70 | 400 – 450 |
| Cannington Connection | 60 | 62 | 220 | 35-50 | 400 – 450 |
| Phosphate Hill Connection | 60 | 63 | 220 | 35-50 | 400 – 450 |
| Dajarra Road to cut-in near Chumvale | 120 | 4 | 220 | TBC | 400 – 450 |

The construction process is expected to take three years, and will involve the following:

- Removal of all vegetation that is likely to interfere with the safe functioning of the transmission line (assume a maximum width of 60 m along the corridor selection.
- Construction of access tracks along the corridor selection
- Temporary construction camps (7) to accommodate the construction workforce
- Temporary workshops and site offices
- Temporary construction laydown/delivery areas, at substations and for the transmission line construction zones, will include access roads and fencing
- Temporary concrete batching plants
- Pulling and tensioning sites approximately every 4-5 km
- Works to install concrete tower foundation, on-site assembly of towers and stringing of conductor wire between towers
- Installation of substations.

The construction process will involve a range of large scale equipment including: bulldozers, graders, excavators, drill rigs, truck-mounted augers, flatbed trucks, forklifts, rigging and service trucks, air compressors and generators, all terrain cranes, concrete trucks and crew trucks, pullers, tensioners and wire reel trailers. State-controlled roads will be used to allow the safe transportation of construction materials. Helicopters will be used for the stringing of conductor draw lines and to support other construction activities.

The transmission network has a design life of 40 years. Unless the life of the Project is extended, the ultimate decommissioning of the Project would require the removal of the transmission network infrastructure in accordance with the relevant standards and legislation applicable at that time.

The decommissioning process would include:

- Conductors and earth wires being lowered, wound onto drums and transported for recycling
- Towers dismantled, steel structures transported, and the scrap metal recycled
- Footings would be cut off between 0.3 and 1.0 m deep with the lower end of the footing remaining in place
- Rubble from the removed section of the footing would be removed from site.

If no further transmission lines were planned for the easement, then the easement would be surrendered and returned in an acceptable condition.

# 5.0 Legislative context and standards

The following review identifies key documents which provide relevant guidance for the visual assessment of the Project. This should be read in conjunction with the land use and legislation and approvals chapter of the EIS (Chapter 4 and 5) and its response to the planning scheme benchmarks.

## 5.1. Regional Planning Framework

The state level planning strategies for this region intend for the Projection of scenic amenity balanced with development, and for development of infrastructure to not result in an unacceptable reduction in scenic amenity. The *North Queensland Regional Plan* and *North West Regional Plan* are reviewed in the following sections.

### 5.1.1.1. North Queensland Regional Plan

The *North Queensland Regional Plan,* Queensland Department of State Development, Manufacturing, Infrastructure and Planning, 2020, applies to the study area between Woodstock and the western edge of Charters Tower Regional Council area.

The Project is not covered by a Strategic Environmental Area. The proposed substation at Woodstock would be located in close proximity to Mingela State Forest, which forms part of the 'Highland reach' Strategic Environmental Area.

The corridor includes several areas with Regional Biodiversity Value and crosses several Regional Biodiversity Corridors.

While the *North Queensland Regional Plan* does not contain a map identifying areas with regional landscape value, the plan states that '*areas of high scenic and natural amenity*' are some of the region's major nature-based drawcards, and managing environmental outcomes with these uses, including scenic amenity, is '*paramount* (p. 50). In particular, policy 2.1.3 requires the protection of '*regional landscape values*' including '*scenic amenity areas and important recreational areas*' (p. 70).

### 5.1.1.2. North West Regional Plan

The *North West Regional Plan: planning for a stronger, more liveable and sustainable community,* prepared by the Queensland Department of Infrastructure and Planning, 2010, applies to the Project between Hughenden and Mount Isa, and south to Cannington and Phosphate Hill.

This Plan establishes a vision, strategies and policies which aim to protect and manage the region's landscape values.

The North West Regional Plan highlights the diverse scenic features of the region including those found within the savannah and upland country, World Heritage listed fossil deposits (Riversleigh), and National Parks (White Mountains, Porcupine Gorge and Blackbraes).

Scenic Amenity is one of five Natural Environment Objectives within the *North West Regional Plan* and its strategies and policies states:

*"1.3.1 Identify and protect areas of scenic amenity from inappropriate land uses."*

*"1.3.3 Plan, design and develop infrastructure to protect, manage and enhance regional landscape values."*

## 5.2. Local Planning Schemes

The transmission line will traverse seven local government areas, including:

- Burdekin Shire Council
- Charters Towers Regional Council
- Flinders Shire Council
- Richmond Shire Council
- McKinlay Shire Council
- Cloncurry Shire Council
- Mount Isa City Council.

The review found that there are no locally designated protection areas for visual amenity or views relevant to the study area. However, relevant overarching requirements are described in the following sections.

### 5.2.1. Burdekin Shire Council Planning Scheme

The Project, including Woodstock Substation, would be located in the western part of the Burdekin Shire. The site is zoned rural and contains no identified natural features or registered national estate sites (Natural Features and Resource Overlay Map 1); nor are there any important views or vistas identified within the shire.

It is however, a Desired Environmental Outcome of the *Burdekin Shire IPA Planning Scheme*, that urban development and infrastructure '*retains and enhances the residential and architectural style of the towns and villages, including scale, intensity, built form, visual impacts and environmental impacts'* (s.3.1.3 c vi, Burdekin Shire Council, 2011).

### 5.2.2. Charters Towers Regional Council Planning Scheme

The *Charters Towers Regional Town Plan 2020* (Charters Towers Regional Council, 2020) has the objective of protecting the region's historic character, scenic natural landscapes and rural character and amenity.

The corridor selection crosses the central part of the council area, south of Charters Towers, within the rural zone. The rural zone code supports uses and activities that are compatible with '*the character and environmental features of the zone'* (s. 6.2.7.3.2).

Although the natural environment overlay code supports development that '*maintains or enhances the scenic amenity of important natural landscapes, views and vistas*', the plan does not identify any areas specifically containing landscape character value, nor does it identify any views or vistas for protection (s. 7.2.4.2).

There are requirements for buildings adjacent to heritage listed buildings, which would be relevant if a temporary construction camp is planned adjacent to such a building. There is also a requirement for outdoor lighting to be designed so that it does not create loss of amenity.

### 5.2.3. Flinders Shire Council Planning Scheme

A key objective of the *Shire of Flinders Planning Scheme 2017* is to preserve the Shire's '*liveability and sense of place*' (s.3.2). In particular, the plan supports development that '*integrates with and protects the natural values and character of the local area'* (s.3.5.2.2 SO1).

The corridor selection crosses the Flinders River, northeast of Hughenden. The wetland and waterway corridor overlay code requires that '*the natural scenic, amenity and landscape values of waterway corridors and wetlands'* be maintained or enhanced and the acceptable outcomes require '*restoration/rehabilitation of native vegetation of adjoining nearby degraded areas'* to be undertaken (s. 8.2.6.3, AO 3.1).

The planning scheme does not identify any specific views, lookouts or areas containing landscape character value for protection within the Shire.

### 5.2.4. Richmond Shire Council Planning Scheme

The corridor selection crosses the central part of the council area, south of Richmond, within the rural zone (Richmond Shire Council, 2005). The rural zone code supports the uses and activities that are '*compatible with the character of the locality'* (Table 3.1C, P2) and '*will not detrimentally affect rural amenity*' (s. 3.1.2b).

### 5.2.5. McKinlay Shire Council Planning Scheme

The corridor selection crosses the central part of the council area, south of the Flinders Highway, within the rural zone, which aims promote uses and activities that are compatible with character and environmental features of the zone, and maintain the '*character and landscape of all rural land*' (s.5.2.4.1, McKinlay Shire Council, 2019).

The non-resident workforce accommodation (NRWA) code also aims to ensure they are '*appropriately located to protect the amenity of the locality'* and '*appropriately screened and landscaped*' (s.6.3.2).

### 5.2.6. Cloncurry Shire Council Planning Scheme

The *Cloncurry Shire Planning Scheme 2016* recognises the scenic value of the shire's landscape. The scenic amenity clause requires development to protect '*existing views to areas of high scenic value within the Shire, including the Selwyn Ranges and Overlander*'s Way' (s.3.4.2.2[2]). The corridor selection crosses the Selwyn Ranges south of Cloncurry and crosses the Barkly Highway (Overlander's Way) in two locations, between Cloncurry and Mount Isa.

Specific outcomes for managing the scenic amenity of the shire include:

*(1) Visual intrusions on the landscape such as mining, extraction or other forms of visually dominant development, are designed, located, operated and rehabilitated to mitigate negative scenic amenity impacts.*

*(2) Regional landscape and scenic amenity areas are preserved, especially along the Overlander's Way, a predominant tourist route, with additional outdoor recreation activities promoted in these areas* (s.3.4.2.1[1-2]).

The planning scheme does not identify any specific views, lookouts or areas containing landscape character value for protection within the Shire.

### 5.2.7. Mount Isa City Council Planning Scheme

The *City of Mount Isa Planning Scheme 2020* recognises the '*unique character*' scenic value of the city's landscape, including the '*ranges, valleys, waterways, floodplains, vegetation and rural farming areas, and the specific views of these from various locations'* (s. 3.4.4, SO2).

The corridor selection crosses through a hilly area southeast of the city containing '*scenic amenity'* value, as identified in the overlay maps. The natural environment and scenic amenity clause requires development to protect the '*predominant natural character of these areas'* and ensure the '*vegetation on the hills'* is retained (s. 3.4.4, LS 2.1-2). The scenic amenity overlay code further requires the following relevant outcomes for areas containing scenic value:

- '*Development is compatible with the character and does not reduce the scenic amenity of a place*
- *Development is sited to minimise any potential adverse impacts on the scenic qualities of the site and the area, having regard to (amongst other things):*
  - *(a) retaining important skyline elements, including vegetated ridgelines; and*
  - *(b) retaining significant views into and out of the area; and*
  - *(c) achieving built form which is not obtrusive, particularly from key viewing points and access routes; and*
  - *(d) retaining and supplementing significant vegetation and other landscaping; and*
  - *(e) avoiding earthworks, driveways, car parking areas and other development that might contribute to visual scarring of the landscape*.
- *The scale and design of development complements the integrity of the landscape*

*and does not dominate or adversely impact the natural scenic landscape.*

- *Development on the hills does not obstruct views from key outlooks, e.g. Mount Isa Lookout*' (s. 8.2.9.3, Table 8.2.9.1, PO1-4).

## 6.0 Existing environment

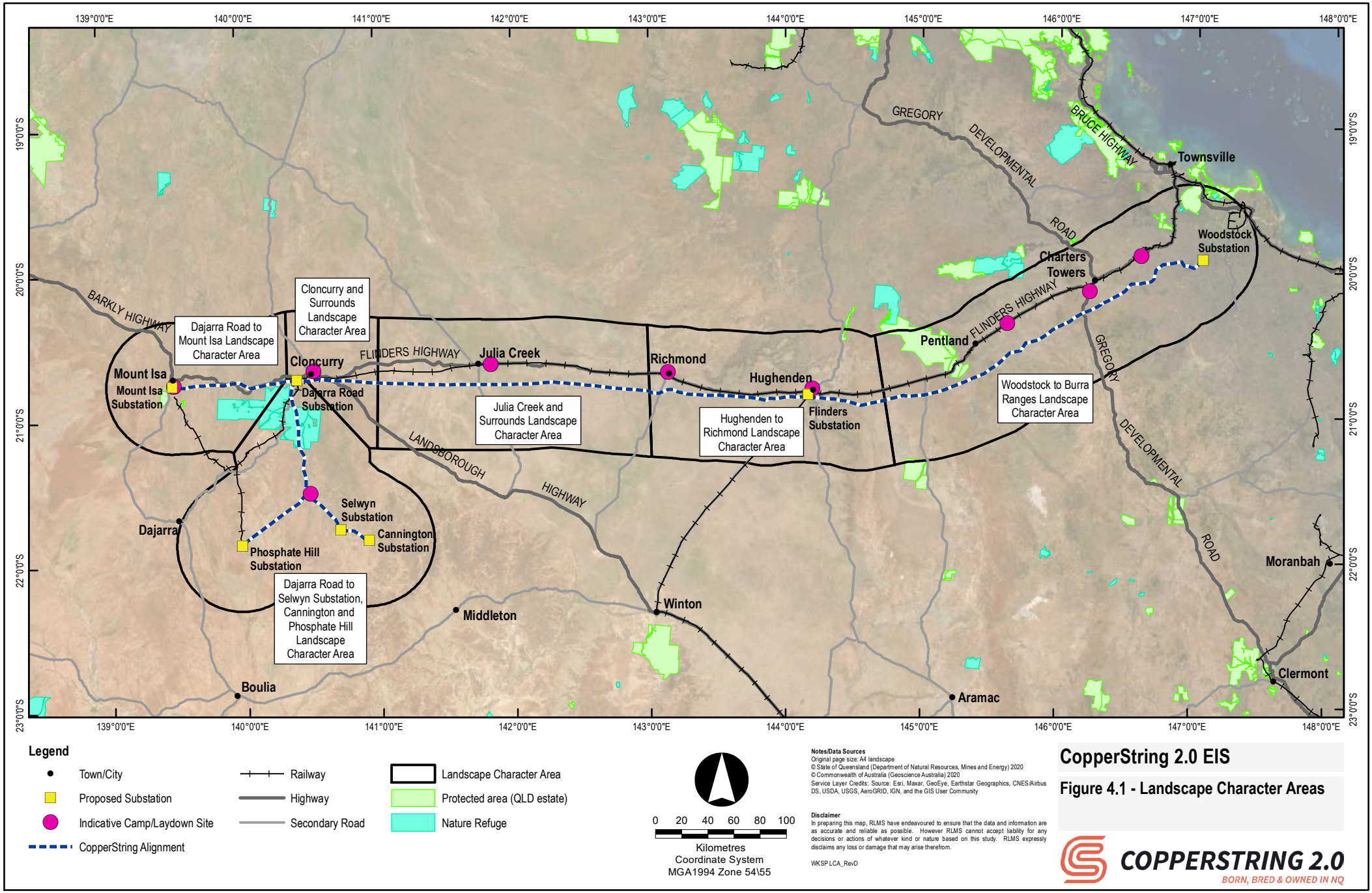
The following section describes the existing visual conditions of the study area.

The site is located between Townsville in the east, Mount Isa in the west and Cannington and Phosphate Hill in the south, extending approximately 1,000 km and generally following the alignment of the Flinders Highway before fanning out across the North West Minerals Province. Although there is a diverse mosaic of landscapes which comprise this corridor, six key landscape character areas have been identified. These relate to the landscape's ability to visually absorb the transmission line, and therefore are based primarily on topography and vegetative cover. Refer Figure 6.1.

These landscape character areas are:

- Woodstock to the Burra Range
- Hughenden to Richmond and surrounds
- Julia Creek and surrounds
- Cloncurry and surrounds
- Dajarra Road to Mount Isa
- Dajarra Road to Cannington and Phosphate Hill

The following section describes each of these landscape character areas in greater detail.

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## Figure 4.1 - Landscape Character Areas

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## 6.1. Woodstock to the Burra Range

In the vicinity of Woodstock the landform is mountainous, as the corridor selection begins in the eastern foothills of the Great Dividing Range and traverses the range as it travels west towards the Burdekin Falls Dam Road. This landscape is heavily vegetated and largely in its natural state. The Burdekin Falls Dam Road is the first sealed road intersected by the Study Area, and the closest the public are likely to get visual access to the first 100 km of the Project from publicly accessible locations.

Vegetative cover between Woodstock and Pentland has largely been retained, giving the Study Area a wooded character. The study area predominantly consists of dry Eucalypt woodland with a grass understory.

The landform is gently undulating, and the study area is dissected by the Burdekin and Cape Rivers which are sizable waterways with large sandy floodplains.

The major town in the Study Area is Charters Towers (approx. population of 8000) which contains low-set, low density housing. The townscape is dominated by the Main Street which has a distinct period character. It is lined with a number of historical buildings that appear in good condition. Built development is otherwise limited to small townships.

Pentland is a small cluster of houses located to the west of the Highway, centred around the railway station. It includes a couple of historic rural character shops and buildings and mainly low storey houses scattered around a grid of sealed roads centred on the Highway. There are only unsealed roads leading south towards the corridor selection at this location.

Just beyond the township of Pentland, the Highway climbs the Great Dividing Range, which has an elevation of 550 m AHD, as it passes through the White Mountains National Park.

This landscape is also known as the Einasleigh Uplands. The Burra Range Lookout is located adjacent to the Highway and includes interpretive signage, a picnic shelter, water and seating. This viewpoint provides a vantage point from which an attractively composed view through the range and over the plains is featured.

West of the range the small township of Torrens Creek is located at the intersection of the Flinders Highway and Torrens Creek Aramac Road which extends south towards Aramac and Barcaldine. The Kennedy Energy Park, comprising wind and solar farms with battery storage, is located between Torrens Creek and Hughenden. The wind turbines provide visual interest in views towards Mount Walker on the eastward approach to Hughenden.

The Flinders Highway is a two lane main road running generally east to west through the study area and largely running parallel to the north of the corridor selection.

A railway line also generally runs to the south and parallel to the Flinders Highway. The line is located at grade with the Highway in most parts and merges visually into the surrounding landscape, unless a train is passing. Railway stations are located at Charters Towers, Torrens Creek and Pentland.

At night, the landscape is generally very dark, with lighting mainly associated with the towns and settlements in the Study Area. Charters Towers would be visually quite a bright location in this area. Pentland has minimal lighting, restricted to a few street lights centred around the train station and in front of the shops on the Highway, and lighting from private residences and vehicles.

## 6.2. Hughenden to Richmond and surrounds

After crossing the Great Dividing Range, the landscape flattens, although some low hills feature on the horizon. A number of dry waterways traverse the corridor selection; the Flinders River is the largest waterway and runs generally east to west through the Study Area between 10 km and 50 km north of the Project.

As the viewer progresses westwards, the vegetation becomes sparser and the tree canopy lowers to 5-10 m in height. Vegetation changes from Eucalypt woodland to mid-story Acacia scrub with a grass understory. As the transmission line approaches Richmond, trees become rare and grassland dominates. The landscape becomes increasingly rural in appearance with cattle grazing and occasional homesteads. The horizon becomes a dominant feature of the landscape as the topography flattens.

As the vegetation becomes sparser, built infrastructure including existing power lines and the railway line, running parallel to the Flinders Highway become more visually prominent. They parallel the Highway for great distances, creating a strong set of lines converging on the horizon and emphasising the open and flat landscape. In some situations, where the powerlines and rail cross the Highway and follow an alternate route, these elements become visually jarring against the flat landscape.

Hughenden is the main township in this landscape character area with a population of around 1200. It forms the north eastern destination on the 'Australian Dinosaur Trail'. It has a historical central street, but is flanked by rail yards, electricity substations and a convergence of powerlines and railway lines. These elements give the town a somewhat visually unappealing view from its approaches, emphasised by the broad, open plain on which it sits.

Hughenden is surrounded by two elevated areas, the Porcupine Gorge National Park which is situated some 50 km to the north; and Mount Walker located 10 km to the south. Both of these areas rise out of a broad plain. A viewing area has been developed at Mount Walker including six designated viewing locations. These locations are accessed by an unsealed road, however the location is well advertised in town and is particularly popular for sunset views.

The Hughenden Lookout, oriented generally north to northeast, has Hughenden visible within its panoramic view. The township is located in the middle ground, and Porcupine Range creates a scenic backdrop.

Further to the west, and forming the north western destination on the 'Australian Dinosaur Trail', is the much smaller township of Richmond, home to around 550 people. This township has a similar character to Hughenden with a scattering of historic buildings and a context of converging powerlines and rail.

The Flinders Highway is a two lane Highway running generally east to west through the study area and largely running parallel to the corridor selection. A railway line also generally runs to the south and parallel to the Flinders Highway. Railway stations are located at Hughenden and Richmond. The railway sits generally at the same grade as the Highway and surrounding landscape, however, for a number of stretches between Hughenden and Richmond the railway corridor is elevated on embankment. This embankment obscures views to the south of the Highway, and completely blocks them when trains pass.

A rest stop, with basic picnic facilities and an amenities building is located between Hughenden and Richmond, adjacent to the Flinders Highway and oriented to the south towards the corridor selection.

At night, the landscape is generally very dark, with lighting mainly associated with the significant towns along the corridor selection. Hughenden and Richmond in particular would

be visually quite bright locations in this character area, and whereas smaller locations such as Pentland, would have minimal lit areas, restricted to a few street lights centred around the train station and in front of the shops on the Highway, and lighting from private residences and vehicles.

### 6.3. Julia Creek and surrounds

Julia Creek, with an approximate population of 500, is the main physical feature of this landscape area. It is a small, low-set township with the Highway forming the main street.

The landscape surrounding Julia Creek, known as the Carpentaria and Inland Plains and Mitchell Grass Downs Savanna, is very flat. The vegetation is sparse and dry, with pasture and grassland visually dominant. The Flinders River runs through this character area and has a broad river catchment.

The Flinders Highway continues through this character area as a two lane Highway running generally east to west and largely running parallel to the corridor selection. The railway line generally runs to the south and parallel to the Flinders Highway travelling west to Julia Creek, however it diverts significantly to the south as it passes Julia Creek, not rejoining the Highway again within this character area. A station is located at Julia Creek. The rail is mainly at the same grade as the Highway throughout this area.

The town has its own 30 m high wineglass-shaped water tower, which it is boasted can be seen from 20 km away.

At night, the landscape is generally very dark, with lighting mainly associated with the significant towns along the corridor selection. Julia Creek would be visually quite bright locations in this character area, and whereas smaller clusters of development would include minimal lighting, associated with private residences and vehicles.

### 6.4. Cloncurry and surrounds

Approximately 50 km to the east of Cloncurry, the topography alters, with gently undulating hills and rocky outcrops, known as the Isa Highlands, appearing. The vegetation also changes, with Acacia scrub replacing the grasslands. The corridor selection crosses a number of narrow, ephemeral waterways in this character area. Large termite mounds and more visibly ‘red’ soils also feature in the landscape.

Cloncurry, with an approximate population of 2700, has a similar appearance to other townships along the Flinders Highway. It is low set with wide streets and a number of historical buildings, including the foundation site of the Royal Flying Doctors Service. The township sits next to the Cloncurry River which can run dry.

Just beyond Cloncurry, an existing electricity substation is located at Chumvale, on the Cloncurry Dajarra Road. The Flinders Highway continues through this character area as a two lane Highway running generally east to west and largely running parallel to the corridor selection. The railway line joins the Flinders Highway some 25 km east of Cloncurry, and runs generally to the south and parallel to the Flinders Highway until it reaches the Landsborough Highway where it again diverts south before skirting by the southern outskirts of Cloncurry township and into town where a passenger train station is located.

At night, the landscape surrounding Cloncurry is generally very dark, with lighting mainly associated with the township of Cloncurry, and vehicles on the Highways which converge on the town.

### 6.5. Dajarra Road to Mount Isa

The Northwest Highlands Bioregion is characterized by its rugged hills separated by undulating valleys. The landscape is largely vegetated with grasslands, scattered shrubs and clumps of eucalypts, creating a largely vegetated landscape. The combination of rocky hills and

variable vegetation result in considerable visual interest. A number of rivers run through this area, and are fringed with overarching eucalypts and other riparian vegetation, punctuating the surrounding landscape.

The Flinders Highway meanders through this character area as a two lane Highway running generally east to west. A number of rest stops, memorials of cultural interest, day use and camping facilities are located along this route. The Highway weaves through the valleys, highlighting views towards a rugged hillside at each turn. In a number of locations, these hills and ridges remain a focal point for a number of kilometres.

This area includes a number of existing transmission lines cutting through this landscape and stepping over the hills. In some locations this infrastructure reduces the scenic amenity of the area, particularly to views from the Highway.

Mount Isa, with an approximate population of 18500, is a regional centre. The town is centred on the Mount Isa Mine, which towers over the city. The city itself has a functional appearance with a small central business district surrounded by residential areas.

At night, the landscape is generally very dark throughout much of this character area. However, the town of Mount Isa is a brightly lit area, with the sky glow associated with the town being visible from approaching views. Vehicles using the Highways which converge on Mount Isa would also be transient sources of light, brightening an otherwise dark landscape.

## 6.6. Dajarra Road to Cannington and Phosphate Hill

In the north, the topography of this area comprises gently undulating hills with rocky outcrops, known as the Isa Highlands, this gradually flattens to the south. The vegetation also changes from mainly acacia scrub and grasslands in the north to more open grasslands to the south. A number of narrow dry waterways traverse this landscape, tributaries of the Burke, Hamilton and McKinlay Rivers.

This is a mining district, with three major mining operations being located in this area, Cannington, Phosphate Hill and Osborne. These mining areas include a range of industrial infrastructure and workers camps and are serviced by heavy vehicle and rail transportation.

A few local roads and un-surfaced tracks provide access to this area, the largest and most heavily trafficked roads are the Cloncurry Dajarra Road in the north east, and Toolebuc McKinlay Road in the southeast of this character area.

Heavy rail traverses the landscape beginning at Cloncurry and Mount Isa, in the east and west, and joining in the vicinity of Boundary Hill, where they follow a relatively straight route south to the Phosphate Hill Mine. Passenger rail follow this route from Cloncurry to Mount Isa via Boundary Hill.

At night, the landscape in this area is generally very dark. There are no towns, and lighting is generally limited to the mines themselves, private residences and properties, lights from vehicles using the roads, and trains on the rail lines.

# 7.0 Visual impact assessment

## 7.1. Visual Sensitivity of the Study Area

The visual sensitivity of the study area is influenced by a range of tourist routes, facilities and land uses located throughout the study area. The following discussion summarises these generally. These characteristics will then be used in the representative viewpoint assessment to inform the visual sensitivity of each view.

Overall, the study area includes several important historic and cultural tourist routes. The location of a view on a tourist route or within a designated open space area or viewpoint typically increases its sensitivity due to the greater number of likely viewers and the greater emphasis that travellers, tourists and recreational users have on landscape appreciation. Key receptors identified as likely to have an elevated visual sensitivity are:

- The **Flinders Highway** and **Barkly Highways**, which combine to run east to west through the entire study area follow a route that is called the 'Overlanders Way'. This tourist route runs from Townsville to Tennant Creek, and is a historic route that has been in use for over 100 years. This route offers oblique views to the study corridor, available for long durations. This is a heavily trafficked route, particularly by 'Grey Nomads' (Retired Australians with Campervans or Trailers).
- The **'Inlander' travel train** passenger service runs generally to the south and parallel to the Flinders Highway, with a passenger service running twice a week between Townsville and Mount Isa. This railway corridor includes both passenger services and freight trains. Railway stations are located at Charters Towers; Torrens Creek; Pentland; Hughenden; Richmond; Julia Creek; and Cloncurry. The passenger service runs infrequently, with a weekly service stopping at all 'pre-booked' stations, and is likely to have many travellers on each train. This vantage point offers its passengers long duration, 180-degree views from windows along each side of the train.
- The **Landsborough Highway** forms part of the 'Matilda Way' tourist route through the outback. The route runs from the New South Wales border in the south to the Gulf of Carpentaria in the north, between Cunnamulla and Karumba.
- The **'Great Inland Way'**, a national route from Sydney to Cairns, crosses the corridor selection as it passes the Gregory Development Road south of Charters Towers.
- The **White Mountains National Park** offers panoramic and scenic viewpoints across the Woodstock to Burra Range character area.
- **'Australia's Dinosaur Trail'** forms a triangle between Hughenden, Richmond and Winton, utilising the Flinders Highway between Hughenden and Richmond, the Richmond Winton Road (Marine Fossil Byway) and the Kennedy Developmental Road (Dinosaur Way) to Winton.
- **Mount Walker**, a distinctive wooded ridge rising from the broad plains of Hughenden offering panoramic views from several formalised viewpoints. This viewing area is accessed by an un-surfaced road, with informal car parking and picnic tables.
- **Chinaman Creek Dam Reserve**, a local recreation area and lookout are located in the Chinaman Creek Dam reserve, south west of Cloncurry. The lookout offers broad 180-degree views across the landscape, and includes the township of Cloncurry, the Great Australia Mine (Copper and Gold) and several existing powerline easements.

These elements provide visual and focal points within this view.

- Burke and Wills Memorial, is a small local memorial located adjacent to the Barkly Highway between Cloncurry and Mount Isa.

Table 7.1 summarises the sensitivity from these receptors.

TABLE 7.1 SENSITIVITY OF KEY RECEPTORS

| Location | Visual Sensitivity |
|---|---|
| Flinders Highway, Woodstock to Cloncurry | Low |
| Landsborough (Matilda) Highway, Winton to Cloncurry | Low |
| White Mountains National Park | Moderate |
| Barkly Highway (Mount Isa Riversleigh Byway), Cloncurry to Mount Isa | Moderate |
| Inlander Travel Train, Townsville to Mount Isa | Low |
| Kennedy Developmental Road (Dinosaur Way) Hughenden to Winton | Low |
| Richmond Winton Road (Marine Fossil Byway) | Low |
| Mount Walker | Low |
| Chinaman's Creek Dam Reserve | Moderate |
| Burke and Wills Memorial | Low |

Generally, view from townships and local roads would range from low to minimal sensitivity due to the spatial separation .

## 7.2. Magnitude of change Project considerations

The magnitude of change level describes the extent of change resulting from the Project and the compatibility of these new elements with the surrounding landscape. There are some general principles regarding the relationship between the Project and the landscape which determine the magnitude of change.

These principles, or assumptions, relate to how well a transmission line (and associated Project infrastructure) can be absorbed into the landscape and what is more or less visually harmonious. These include:

- Scale, the larger the scale of the structures, the more visually prominent they are likely to be
- Form, the style and form of the infrastructure can assist in the absorption of development into a view i.e. lattice towers can be seen through and more visually light weight in some settings
- Distance, the greater the distance, the less prominent the towers are likely to be
- Landform, the location of the towers in relation to the surrounding landform i.e. landform may intervene and screen views, or may allow greater visibility if the Project elements are located on higher ground
- Vegetation, taller trees and more dense vegetation will screen and reduce visibility
- Development context and character, the presence of other existing infrastructure of a similar character can increase the compatibility of development within a view
- Alignment and line, simple lines and an alignment reflecting the patterns of the existing landscape can reduce visual contrast, whereas intersecting lines and discordant alignments can increase the visual prominence of Project elements.

These principles will be applied generally to the viewpoint assessment.

## 7.3. Assessment of Representative Viewpoints

### 7.3.1. Selection of Representative Viewpoints

Field work was undertaken during March of 2020. The following viewpoints were selected as representative of the range of views to the site and the proposed development:

**Woodstock to the Burra Range**

1. Burdekin Falls Dam Road, view north
2. Tower Hill Lookout, Charters Towers, view south
3. Gregory Developmental Road, view south
4. Ju Ju's lookout, White Mountains National Park, view south

**Hughenden to Richmond and surrounds**

5. Prairie Muttaburra Road, view south
6. Flinders Highway, east of Hughenden, view south
7. Hughenden Muttaburra Road, view south
8. Mount Walker, Hughenden, view north
9. Flinders Highway, west of Hughenden, view south
10. Flinders Highway rest stop at Marathon, view south

**Julia Creek and surrounds**

11. Richmond Winton Road, view south
12. Maxwelton Rest Stop, Flinders Highway, view south
13. Julia Creek Kynuna Road, view north
14. Julia Creek- Cloncurry rest stop, Flinders Highway, view south

**Cloncurry and surrounds**

15. Landsborough Highway, view north
16. Chinaman Creek Dam Recreation Area lookout, view south
17. Cloncurry Dajarra Road, view south

**Dajarra Road to Common South Point, Cannington and Phosphate Hill**

18. Cloncurry Dajarra Road, view south
19. Cloncurry Dajarra Road, view north east

**Dajarra Road to Mount Isa**

20. Barkly Highway rest stop, view southeast
21. Barkly Highway, view north east
22. Barkly Highway, view west
23. Barkly Highway rest stop, view south east
24. Mount Isa Duchess Road, view south
25. Old Mica Creek Road, Mount Isa, view south.

## 7.4. Assessment of Daytime Impacts

The following sections summarise the daytime visual impacts identified in the representative viewpoint assessment and site visit observations.

### 7.4.1. Woodstock to the Burra Range

#### 7.4.1.1. Representative viewpoint Assessment

Figure 7.1 shows the location of the viewpoints which have been assessed within the Woodstock to Burra Range landscape character area.


FIGURE 7-1 VIEWPOINT LOCATION PLAN – WOODSTOCK TO THE BURRA RANGE LANDSCAPE CHARACTER AREA

*Viewpoint 1: Burdekin Falls Dam Road, view north*

FIGURE 7-2 VIEWPOINT 1: BURDEKIN FALLS DAM ROAD, VIEW NORTH

FIGURE 7-3 VIEWPOINT 1: BURDEKIN FALLS DAM ROAD, VIEW NORTH, PHOTOMONTAGE

TABLE 7-2 VIEWPOINT ASSESSMENT - VIEWPOINT 1

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| View across a relatively flat landform with woodland vegetation along the road enclosing the view. | **Low**<br>Local road connecting the Flinders Highway with Burdekin Falls Dam. | **Moderate**<br>The corridor selection would cross this view, with towers located about 100m away, and crossing the road in the foreground of this view.<br>• Vegetation clearing would be seen where it occurs adjacent to the road, if required, and otherwise would be screened by retained roadside vegetation outside the corridor.<br>• Towers would be set back from the road partly screened by existing vegetation.<br>• The towers would be seen rising prominently above the surrounding vegetation for a short section of the road.<br>Overall, this change would change the visual character of views from a short section of this road. | **Low** |

*Viewpoint 2: Tower Hill Lookout, Charters Towers, view south*

FIGURE 7-4 VIEWPOINT 2: TOWER HILL LOOKOUT, CHARTERS TOWERS, VIEW SOUTH

TABLE 7-3 VIEWPOINT ASSESSMENT - VIEWPOINT 2

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Broad panoramic view over Charters Towers and the surrounding landscape including the Hervey Range (north of Townsville) in the far background. | **Moderate**<br>Interpretive trail and lookout used by residents and visitors to Charters Towers. | **Negligible**<br>The corridor selection would cross this view, located about 18 km away, and with numerous towers following a mainly straight alignment.<br>• Towers would be in the far background of this view (approximately 18 km) and unlikely to be discernible<br>• The towers would be seen against a backdrop of vegetation further absorbing the towers and any vegetation clearing into the view. | **Negligible** |

*Viewpoint 3: Gregory Developmental Road, view south*

FIGURE 7-5 VIEWPOINT 3: GREGORY DEVELOPMENTAL ROAD, VIEW SOUTH

TABLE 7-4 VIEWPOINT ASSESSMENT - VIEWPOINT 3

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Woodland vegetation encloses the view across an undulating landform with small hills providing visual interest in the background of the view. | **Low**<br>Road used by local residents, visitors and workers travelling between Charters Towers and Clermont | **Moderate**<br>The corridor selection would cross this view, with towers located about 500 m away, and crossing the road in the middle ground of this view.<br>• Vegetation clearing would be seen where it occurs adjacent to the road, if required, and otherwise would be screened by retained roadside vegetation outside the corridor.<br>• Towers would be set back from the road partly screened by existing vegetation.<br>• The towers would be seen rising prominently above the surrounding vegetation for a short section of the road.<br>Overall, this change would change the visual character of views from a short section of this road. | **Low** |

*Viewpoint 4: Ju Ju's lookout, White Mountains National Park, view south*

FIGURE 7-6 VIEWPOINT 4: JU JU'S LOOKOUT, WHITE MOUNTAINS NATIONAL PARK, VIEW SOUTH

TABLE 7-5 VIEWPOINT ASSESSMENT - VIEWPOINT 4

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Elevated, panoramic view to the south, over the undulating foothills of the Burra Range. Dense vegetation and with interesting rock formations characterise this view. | **Moderate**<br>Also known as Burra Range lookout, it is located at the southern end of White Mountains National Park. | **Negligible**<br>The corridor selection would cross this view, located about 11 km away, and with numerous towers following a mainly straight alignment.<br>• Vegetation clearing and towers would be in the far background of the view and unlikely to be perceptible at this distance.<br>Overall, this change would not alter the character of this view. | **Negligible** |

#### 7.4.1.2. Summary of visual impact

*Views from publicly accessible roads*

A number of local roads and tracks cross the corridor selection in this area. During operation of the Project, it is expected that there would be a **negligible** visual impact in views from intersecting roads, such as Burdekin Falls Dam Road (refer Viewpoint 1) and the Gregory Developmental Road (refer Viewpoint 3). This is due to the relatively low sensitivity of these routes and high visual absorption capacity of the surrounding landscape. The gently undulating landform and open forest, with large trees, would reduce the visibility of the Project from intersecting roads.

The corridor selection is aligned generally east-west, parallel to the Flinders Highway, at a distance which varies between 10 and 20 kilometres south of the Highway. Due to this distance, as well as the undulating landform and vegetation, there would be **negligible** visual impact**s** from the Flinders Highway as a result of the Project.

During construction, there would be additional heavy vehicle traffic seen local roads and the Flinders Highway. However, these vehicles are unlikely to cause a noticeable change in the amenity of views as there are heavy vehicles often seen on these roads.

*Views from the railway*

The passenger and freight rail generally follows the Flinders Highway between Woodstock and the Burra Range, located approximately 10 to 20 kilometres north of the corridor selection. As the corridor selection would not be in close proximity to views from the railway, it is not likely that the Project would be a prominent feature in views experienced by passengers on this tourist route. Overall, there would be a **negligible** visual impact in views from the railway.

*Views from public open space and viewpoints*

The most sensitive viewpoints in this area are from Tower Hill lookout, on the southern outskirts of Charters Towers (refer Viewpoint 2) and Ju Ju's Lookout (also known as Burra Range Lookout) at the southern end of White Mountains National Park beside the Flinders Highway (refer Viewpoint 4). These views are of regional sensitivity; however, the distance, intervening vegetation, undulating landform and vegetated background would result in no perceived change in the amenity of these views and a **negligible** visual impact.

*Views from townships*

The corridor selection is located approximately 18 kilometres to the southeast of Charters Towers, and approximately 22 kilometres to the southeast of Pentland. Due to these considerable distances, the Project would not be visible from these townships and therefore there would be a **negligible** visual impact.

### 7.4.2. Hughenden to Richmond and surrounds

#### 7.4.2.1. Representative viewpoint Assessment

Figure 7.7 shows the location of the viewpoints which have been assessed within the Hughenden to Richmond and surrounds landscape character area.

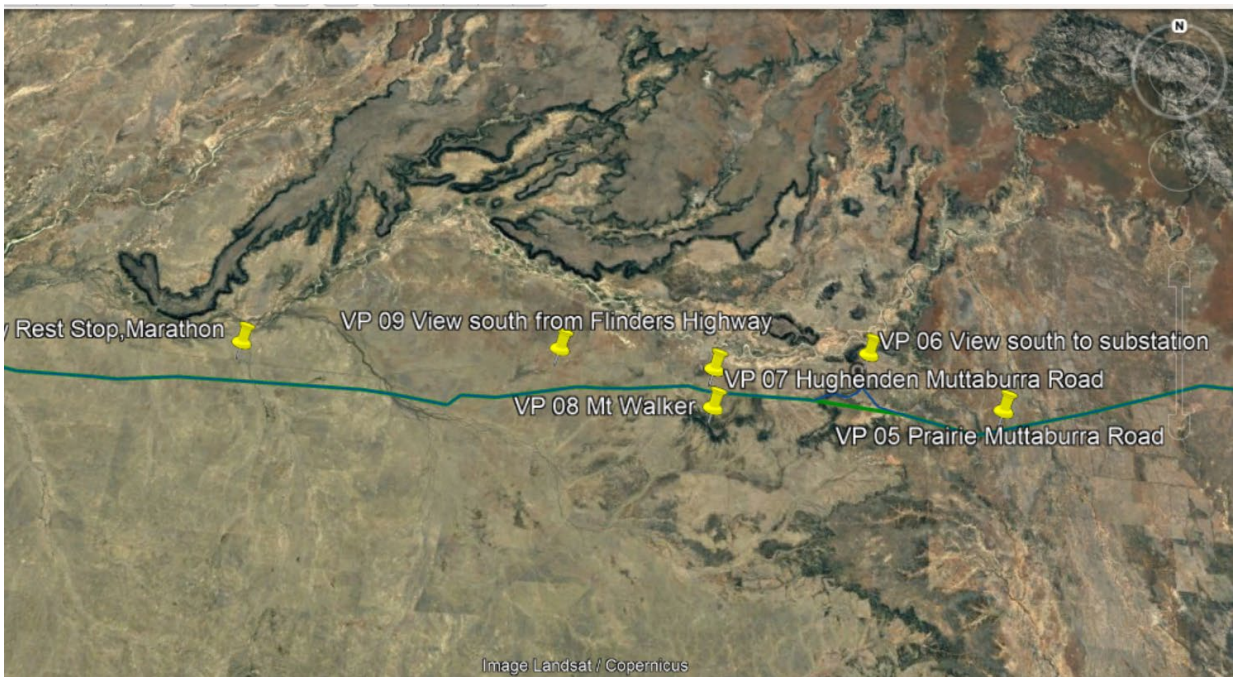



FIGURE 7-7 VIEWPOINT LOCATION PLAN – WOODSTOCK TO THE BURRA RANGE LANDSCAPE CHARACTER AREA

*Viewpoint 5: Prairie Muttaburra Road, view south*

FIGURE 7-8 VIEWPOINT 5: PRAIRIE MUTTABURRA ROAD, VIEW SOUTH

TABLE 7-6 VIEWPOINT ASSESSMENT - VIEWPOINT 5

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| View is enclosed by existing woodland vegetation on a predominantly flat landform. | **Minimal**<br>A local road connecting Prairie and Muttaburra, used mainly by residents and visitors to nearby rural properties. | **Moderate**<br>The corridor selection would cross this view, with towers located about 500 m away, and with numerous towers following a mainly straight alignment, extending east (left of image) and west (right of image).<br>• Vegetation clearing would be seen where it occurs adjacent to the road, if required, and otherwise would be screened by retained roadside vegetation outside the corridor.<br>• Towers would be set back from the road partly screened by existing vegetation.<br>• The towers would be seen rising prominently above the surrounding vegetation for a short section of the road.<br>Overall, this change would change the character of views from a short section of this road. | **Negligible** |

*Viewpoint 6: Flinders Highway, east of Hughenden, view south*

FIGURE 7-9 VIEWPOINT 6: FLINDERS HIGHWAY, EAST OF HUGHENDEN, VIEW SOUTH

TABLE 7-7 VIEWPOINT ASSESSMENT - VIEWPOINT 6

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| This view contains existing large-scale infrastructure, including the Hughenden Solar farm, the wind turbines at Kennedy Energy Park (which are viewed against the skyline) and a substation. | **Low**<br>Forms part of the 'Overlander's Way' tourist route between Townsville and Tennant Creek. | **Moderate**<br>The proposed Jardine Creek Substation would be visible in the centre of this view, about 1 km from the Highway. There would be a transmission line (towers and wires) extending from the south (right of view) to connect with the new substation.<br>• Additional substation, towers and overhead wiring would be seen in the<br>• This infrastructure would be clearly visible unobstructed by vegetation.<br>• Infrastructure, including towers and overhead wiring connecting to substation, characterise this view.<br>While there would be further infrastructure visible, this would be consistent in character with the existing view, and not dominate or change the overall character of this view. | **Low** |

*Viewpoint 7: Hughenden Muttaburra Road, view south*

FIGURE 7-10 VIEWPOINT 7: HUGHENDEN MUTTABURRA ROAD, VIEW SOUTH

FIGURE 7-11 VIEWPOINT 7: HUGHENDEN MUTTABURRA ROAD, VIEW SOUTH, PHOTOMONTAGE

TABLE 7-8 VIEWPOINT ASSESSMENT - VIEWPOINT 7

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Open view to grazing land with scattered trees. Several plateaus, including Mount Walker (right of view) are prominent features visible on the horizon. | **Low**<br>A local road extending north-south between Hughenden and Muttaburra, used mainly by residents and visitors to these towns and nearby rural properties | **Moderate**<br>The corridor selection would cross this view, with towers located about 500 m away, and with numerous towers following a mainly straight alignment, extending east (left of image) and west (right of image).<br>• The towers would be seen unobstructed, rising prominently above the flat landscape and viewed (in part) against the sky.<br>• The towers and wires would add visual clutter to an open view to Mount Walker<br>Overall, this change would alter the character of views from a section of this road. | **Low** |

*Viewpoint 8: Mount Walker, Hughenden, view north*

FIGURE 7-12 VIEWPOINT 8: MOUNT WALKER, HUGHENDEN, VIEW NORTH

FIGURE 7-13 VIEWPOINT 8: MOUNT WALKER, HUGHENDEN, VIEW NORTH, DETAIL

TABLE 7-9 VIEWPOINT ASSESSMENT - VIEWPOINT 8

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Turbines at Kennedy Energy Park visible against skyline of ridgeline to the east (right of view) and solar farm seen near Hughenden (right of view) | **Moderate**<br>Mount Walker includes several lookout locations, offering elevated panoramic views over the surrounding flat rural plains.<br>Frequented by local residents and particularly tourists, including those visiting the Dinosaur Trail | **Low**<br>The corridor selection would cross this view, with towers located about 5 km away, and with numerous towers following a mainly straight alignment.<br>• Due to the elevated location of the viewer, the Project would be seen against the surrounding landscape, assisting in its absorption in the view.<br>• The distance would reduce the prominence of the towers, and the lines would be largely indistinguishable at this distance.<br>Overall, this change would not dominate or change the character of this view. | **Low** |

*Viewpoint 9: Flinders Highway, west of Hughenden, view south*

FIGURE 7-14 VIEWPOINT 9: FLINDERS HIGHWAY, WEST OF HUGHENDEN, VIEW SOUTH

TABLE 7-10 VIEWPOINT ASSESSMENT - VIEWPOINT 9

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Flat landform in the foreground rises to a plateau in the middle ground. Open fields with some blocks of vegetation and scattered trees allow views across the rural landscape to this rise.<br><br>The foreground of this view includes the rail line and Highway infrastructure. | Low<br><br>Located on the 'Overlander's Way' tourist route | Low<br>The corridor selection would cross this view, with towers located on the plateau about 3.5 km away.<br>• The Project would be partly screened by intervening vegetation but otherwise seen rising above the surrounding landscape and viewed against the sky.<br>• The distance would reduce the prominence of the towers, and the lines would be largely indistinguishable at this distance.<br>Overall, this change would not dominate or change the character of this view. | Low |

*Viewpoint 10: Flinders Highway rest stop at Marathon, view south*

FIGURE 7-15 VIEWPOINT 10: FLINDERS HIGHWAY REST STOP AT MARATHON, VIEW SOUTH

TABLE 7-11 VIEWPOINT ASSESSMENT - VIEWPOINT 10

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Flat landform and open fields, with some blocks of low vegetation, allow expansive views across the rural landscape. | Low<br>Located on the 'Overlander's Way' tourist route | Low<br>The corridor selection would cross this view, with towers located about 3.2 km away.<br>• The Project would be partly screened by intervening vegetation but otherwise seen rising above the surrounding landscape and viewed against the sky.<br>• The distance would reduce the prominence of the towers, and the lines would be largely indistinguishable at this distance.<br>Overall, this change would not dominate or change the character of this view. | Low |

#### 7.4.2.2. Summary of visual impact

*Views from publicly accessible roads*

The corridor selection is generally aligned east-west and parallel with the Flinders Highway. It is located between two and 12 kilometres south of the Highway through this landscape character area. In areas where the corridor selection is further away there would be no view of the Project and a there would be a **negligible** visual impact. However, where the corridor selection comes within view of the Flinders Highway, there would be a **low** visual impact.

This includes the views from the Flinders Highway to the proposed Jardine Creek Substation (refer viewpoint 6). In this view the existing substation, renewable energy and existing transmission lines increase the capacity of this view to absorb the Project without changing the character of the view.

In views from the Highway, west of Hughenden, (refer viewpoint 9 and 10) while the open landscape would allow views to the towers and wires on the horizon, they would not be prominent due to the distance.

Several local roads cross the alignment in this area. The Prairie Muttaburra Road passes through an area of woodland vegetation which provides some screening of views towards the corridor selection (refer viewpoint 5), and while the corridor selection would cross this road, the localised removal of vegetation and scale of the towers, would only be appreciated for a short section of the road, and there would be a **low** visual impact.

Views from Hughenden Muttaburra Road would include close range views to the towers and there would be a **moderate** visual impact (refer Viewpoint 7).

*Views from the railway*

The passenger and freight rail generally follows the Flinders Highway between Hughenden and Richmond, about two to 12 kilometres to the north of the corridor selection Due to this distance it is not likely that the Project will be visible to passengers, and where it comes within view, it would not be visually prominent. Therefore, there would be a **low** impact on views from the railway.

*Views from public open space and viewpoints*

Panoramic views from Mount Walker are of moderate visual sensitivity. Due to the distance between this viewpoint and the Project, the route crossing diagonally through a portion of the view, and the Project being viewed against the landscape from an elevated location, the magnitude of change is considered to result in a low reduction in visual amenity and therefore the visual impact on these views is considered to be **low** visual impact (refer Viewpoint 8).

*Views from townships*

The corridor selection runs approximately 5-6 kilometres to the south of Hughenden. There will be some visibility to the corridor selection from receptors on the southern outskirts of the town. However, the visual context of converging railway tracks, a solar farm, urban development and transmission lines reduces the visual sensitivity of this area and increases the capacity of these views to absorb the Project without changes to the character of these views. Therefore, views from Hughenden are expected to be of low sensitivity, and experience a low magnitude of change, resulting in a **low** visual impact.

The corridor selection runs approximately 14 kilometres south of Richmond and is not likely to be visible from the township itself, resulting in a negligible visual impact.

### 7.4.3. Julia Creek and surrounds

#### 7.4.3.1. Representative viewpoint Assessment

Figure 7.16 shows the location of the viewpoints which have been assessed within the Woodstock to Burra Range landscape character area.

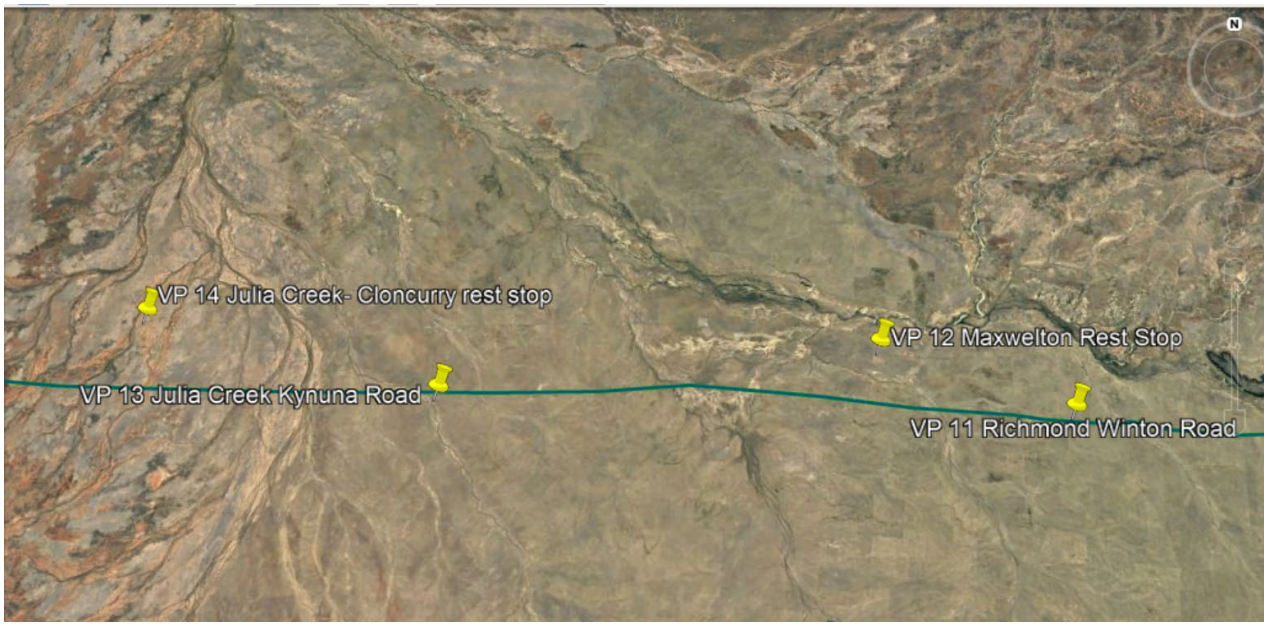



FIGURE 7-16 VIEWPOINT LOCATION PLAN – JULIA CREEK AND SURROUNDS LANDSCAPE CHARACTER AREA

*Viewpoint 11: Richmond Winton Road, view south*

FIGURE 7-17 VIEWPOINT 11: RICHMOND WINTON ROAD, VIEW SOUTH

TABLE 7-12 VIEWPOINT ASSESSMENT - VIEWPOINT 11

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Flat landform and open fields allow expansive views across the rural landscape. | **Low**<br>Road used by local residents accessing Richmond and nearby rural properties, and tourists travelling along the 'Marine Fossil Byway' (part of Australia's Dinosaur Trail) | **High**<br>The corridor selection would cross this view, with towers located to the east and west, extending over the road in the middle ground of this view.<br>• The view to the towers and wires would be unobstructed<br>• The towers would be seen rising prominently above the surrounding landscape and viewed against the sky.<br>Overall, this change would dominate and change the character of this view. | **Moderate** |

*Viewpoint 12: Maxwelton rest stop, Flinders Highway, view south*


FIGURE 7-18 VIEWPOINT 12: MAXWELTON REST STOP, FLINDERS HIGHWAY, VIEW SOUTH

TABLE 7-13 VIEWPOINT ASSESSMENT - VIEWPOINT 12

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Flat landform and open fields, with some blocks of low vegetation, allow views across the rural landscape. | **Low**<br>Road used by local residents accessing nearby rural properties and visitors using the rest stop and travelling along the 'Overlander's Way' tourist route between Richmond and Julia Creek | **Negligible**<br>The corridor selection would cross the view in the far background, about 11 km to the south.<br>• The view to the towers and wires would be partly obstructed by intervening vegetation<br>• The distance would diminish the prominence of the towers which would be seen rising above the surrounding landscape in the far background.<br>Overall, this change would not dominate or change the character of this view. | **Negligible** |

*Viewpoint 13: Julia Creek Kynuna Road, view south*

FIGURE 7-19 VIEWPOINT 13: JULIA CREEK KYNUNA ROAD, VIEW SOUTH

TABLE 7-14 VIEWPOINT ASSESSMENT - VIEWPOINT 13

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Flat landform and open fields, with some blocks of low vegetation, allow expansive views across the rural landscape. | **Minimal**<br>Road used by local residents accessing nearby rural properties | **Moderate**<br>The corridor selection would cross this view, with towers located to the east and west, extending over the road in the middle ground of this view.<br>• The view to the towers and wires would be mostly unobstructed, with some vegetation<br>• Tracks and vegetation clearing along the corridor would not alter the view substantially<br>• The towers would be seen rising prominently above the surrounding landscape and viewed against the sky.<br>Overall, this change would somewhat dominate and change the character of this view. | **Negligible** |

*Viewpoint 14: Julia Creek–Cloncurry rest stop, Flinders Highway, view south*

FIGURE 7-20 VIEWPOINT 14: JULIA CREEK- CLONCURRY REST STOP, FLINDERS HIGHWAY, VIEW SOUTH

TABLE 7-15 VIEWPOINT ASSESSMENT - VIEWPOINT 14

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Flat landform and open fields, with some blocks of low vegetation in the background, allow views across the rural landscape. | **Low**<br>Road used by local residents accessing nearby rural properties and visitors using the rest stop and travelling along the 'Overlander's Way' tourist route between Julia Creek and Cloncurry | **Negligible**<br>The corridor selection would cross the view in the far background, about 15 km to the south.<br>• The view to the towers and wires would be partly obstructed by intervening vegetation<br>• The distance would diminish the prominence of the towers which would be seen rising above the surrounding landscape in the far background.<br>Overall, this change would not dominate or change the character of this view. | **Negligible** |

#### 7.4.3.2. Summary of visual impact

*Views from publicly accessible roads*

The corridor selection continues to be aligned east-west in parallel to the Flinders Highway, about 15 kilometres south of the highway. Due to this distance, it is unlikely that the Project would be visible and there would be **negligible** visual impacts in views from the Flinders Highway (refer viewpoint 12 and 14).

There are only a few roads radiating from Flinders Highway in the vicinity of Julia Creek. Crossing the alignment in this area are Richmond Winton Road and Julia Creek Kynuna Road.

Richmond Winton Road has a slightly higher visual sensitivity, as it is a part of Australia's Dinosaur Trail tourist route. There would be a reduction in the amenity of views from this road due to the introduction of large-scale vertical towers in an otherwise flat rural landscape, resulting **moderate adverse** visual impact (refer Viewpoint 11).

*Views from the railway*

The passenger and freight rail generally follow the Flinders Highway in the vicinity of Julia Creek at a distance of about 10 to 15 kilometres north of the alignment. Due to this distance, only the upper section of the towers would be seen in the distant background of views, and would not alter the character of the view, therefore resulting in a **negligible** visual impact in the vicinity of Julia Creek.

West of Julia Creek, the rail deviates south from the highway, so that it would be about 10 kilometres away from of the alignment as it approaches Cloncurry. Again, due to this distance, it is not likely that the corridor selection would be visible to passengers and therefore there would be a **negligible** visual impact.

*Views from public open space and viewpoints*

The Maxwelton Rest Stop, along the Flinders Highway (refer Viewpoint 12) offers broad open views across the rural landscape. Although this area contains mainly grasslands with little landform or tree cover to enclose views, views from the verge and rest stops along the Flinders Highway are likely to have a **low** visual impact, due to distance of the corridor selection from the rest stop (between 10 to 15 km away).

*Views from townships*

The corridor selection runs approximately 15 kilometres to the south of Julia Creek. It is unlikely that the Project would be visible at this distance, therefore, it is considered that views from Julia Creek would be **negligible**.

### 7.4.4. Cloncurry and surrounds

#### 7.4.4.1. Representative viewpoint Assessment

Figure 7.21 shows the location of the viewpoints which have been assessed within the Woodstock to Burra Range landscape character area.

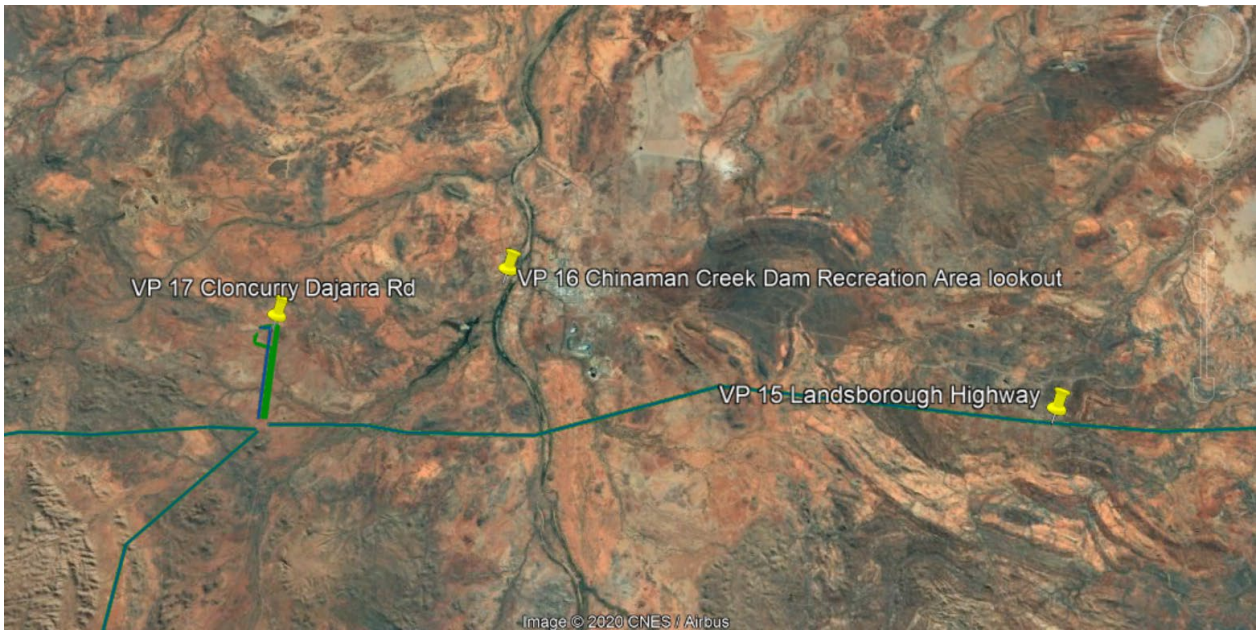



FIGURE 7-21 VIEWPOINT LOCATION PLAN – CLONCURRY AND SURROUNDS CHARACTER AREA

### 7.4.4.2. Viewpoint Assessment

*Viewpoint 15: Landsborough Highway, view north*

FIGURE 7-22 VIEWPOINT 15: LANDSBOROUGH HIGHWAY, VIEW SOUTH

FIGURE 7-23 VIEWPOINT 15: LANDSBOROUGH HIGHWAY, VIEW SOUTH, PHOTOMONTAGE

TABLE 7-16 VIEWPOINT ASSESSMENT - VIEWPOINT 15

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| The landform is undulating to hilly with attractive small dome shaped hills and ridges, providing visual interest and variety. The scattered clumps of vegetation obstruct and frame views from the road. | Low<br>Located on 'The Matilda Way' tourist route, south east of Cloncurry. | Moderate<br>The corridor selection would cross the view in the middle ground of this view.<br>• Towers would be seen from the road for a short section where vegetation and landform does not intervene.<br>• The wires would cross the road at an angle forming a discordant alignment with the road and increasing the prominence of the wires and towers.<br>Overall, this change would somewhat dominate and change the character of this view for a short section of the Highway. | Low |

*Viewpoint 16: Chinaman Creek Dam Recreation Area lookout*

FIGURE 7-24 VIEWPOINT 16: CHINAMAN CREEK DAM RECREATION AREA LOOKOUT, VIEW SOUTH, 180° PANORAMA

FIGURE 7-25 VIEWPOINT 16: CHINAMAN CREEK DAM RECREATION AREA LOOKOUT, VIEW SOUTH, DETAIL VIEW

TABLE 7-17 VIEWPOINT ASSESSMENT - VIEWPOINT 16

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Panoramic view over the town of Cloncurry, existing mine, transmission lines and broader landscape including the dam, river, hills and surrounding bushland areas. | **Moderate**<br><br>Recreational area and lookout used by residents and visitors to Cloncurry. | **Negligible**<br><br>The corridor selection would cross this view, with towers located about 5.5 km away, and follow a mainly straight alignment.<br><br>• Intervening vegetation would intervene and the upper parts on the towers would be seen against a backdrop of vegetation, assisting in their absorption into the view.<br><br>• The distance would reduce the prominence of the towers, and the lines would be largely indistinguishable at this distance.<br><br>Overall, this change would not dominate or change the character of this view. | **Negligible** |

*Viewpoint 17: Cloncurry Dajarra Road, view south*

FIGURE 7-26 VIEWPOINT 17: CLONCURRY DAJARRA ROAD, VIEW SOUTH

TABLE 7-18 VIEWPOINT ASSESSMENT - VIEWPOINT 17

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| The view includes several large (some partly constructed) transmission towers and lines. A backdrop of hills and undulating landform enclose the view. The middle ground is a largely open landscape, with some blocks of vegetation and scattered trees, allowing views across the landscape. | **Minimal**<br><br>A surfaced road used to access mining areas and the town of Dajarra by a small number of locals and workers. | **Low**<br><br>• A transmission line (towers and wires) would extend along Cloncurry Dajarra Road towards the existing substation (right of view).<br><br>• This infrastructure would be clearly visible mostly unobstructed by vegetation.<br><br>• Infrastructure, including towers and overhead wiring connecting to substation, already characterise this view, increasing the absorption of the Project into this view.<br><br>While there would be further infrastructure visible, this would be consistent in character with the existing view, and not dominate or substantially change the overall character of this view. | **Negligible** |

#### 7.4.4.3. Summary of visual impacts

*Views from publicly accessible roads*

The Flinders and Landsborough highways converge to the east of Cloncurry. Generally, the corridor selection is located between one and five kilometres to the south of the Flinders Highway and crosses the Landsborough Highway about 17 kilometres southeast of Cloncurry.

Due to the distance and intervening landform the Project would not be visible from the Flinders Highway in this area and therefore would not experience any significant visual impacts.

The Landsborough Highway, however, would experience a **low** visual impact due to the absorption capacity of the landscape, which is undulating to hilly with scattered trees and vegetation which reduce the visibility of the towers and wires. (refer Viewpoint 15).

West of Cloncurry, there would be views to the Project from the Barkly Highway at Cloncurry Dajarra Road. At this location, the Project would connect with a substation and existing transmission infrastructure. Due to the low to minimal visual sensitivity of views in this location, and the context of existing power infrastructure, there would be a **negligible** impact on views to the Project from this location (refer Viewpoint 17).

*Views from the railway*

The passenger and freight rail runs approximately 10 kilometres to the north of the alignment as it approaches Cloncurry.

Due to this distance, intervening landform and vegetation, it is not likely that the Project will be visible to passengers and therefore there will be a **negligible** visual impact.

West of Cloncurry, for approximately 20 kilometres, the 'Inlander' passenger and freight rail would be within viewing distance of the Project as it continues west towards the Dajarra substation, and south towards the common south point. The rail would be parallel to the Cloncurry Dajarra Road for a further kilometre on the eastern side of the Road.

There would be a low magnitude of change seen from the train, which are of low visual sensitivity, and a **low** visual impact.

*Views from public open space and viewpoints*

The Project would be visible in the background of southward, panoramic views from the Chinamans Creek Dam lookout. However, due to distance and the complexity of this view, the Project would be largely absorbed into the view and there would be a **negligible** visual impact.

*Views from townships*

The corridor selection runs approximately five kilometres to the south of Cloncurry. It is unlikely that the Project will be visible at this distance with intervening vegetation and development and there would be a **negligible impact** on views.

### 7.4.5. Dajarra Road to Selwyn Substation, Cannington and Phosphate Hill

#### 7.4.5.1. Representative viewpoint Assessment

Figure 7.27 shows the location of the viewpoints which have been assessed within the Woodstock to Burra Range landscape character area.


FIGURE 7-27 VIEWPOINT LOCATION PLAN – CLONCURRY AND SURROUNDS CHARACTER AREA

*Viewpoint 18: Cloncurry Dajarra Road, view south*

FIGURE 7-28 VIEWPOINT 18: CLONCURRY DAJARRA ROAD, VIEW SOUTH

TABLE 7-19 VIEWPOINT ASSESSMENT - VIEWPOINT 18

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| A backdrop of hills and undulating landform enclose the view. The middle ground is a largely open landscape, with some blocks of vegetation and scattered trees, allowing views across the landscape. | **Minimal**<br><br>A surfaced road used to access mining areas and the town of Dajarra by a small number of locals and workers. | **Moderate**<br><br>• The Dajarra Substation would be visible in the middle ground of this view, and there would be transmission lines (towers and wires) extending north along Cloncurry Dajarra Road towards the existing substation (behind, out of view). There would a further three transmission lines converging on the substation, approaching the substation from the south, east and west.<br><br>• This infrastructure would be clearly visible mostly unobstructed by vegetation.<br><br>• While there is some infrastructure in the far background, the open landscape characterises this view.<br><br>Overall, this change would somewhat dominate and change the character of this view for a short section of the road. | **Negligible** |

*Viewpoint 19: Cloncurry Dajarra Road, view north east*

FIGURE 7-29 VIEWPOINT 19: CLONCURRY DAJARRA ROAD, VIEW NORTH EAST

Table 7-20 Viewpoint Assessment - Viewpoint 19

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Hills and undulating landform frame this view. Blocks of vegetation and scattered trees form a backdrop and partly enclose this view, containing the visual catchment to this valley. | **Minimal**<br><br>A surfaced road used to access mining areas and the town of Dajarra by a small number of locals and workers. | **Low**<br><br>• The corridor selection would cross the view in the middle ground of this view, partly obstructed by the intervening hillside and vegetation.<br><br>• The wires would cross the road at an angle forming a discordant alignment with the road and increasing the prominence of the wires and towers.<br><br>• Towers would be seen from the road for a short section where vegetation and landform does not intervene.<br><br>Overall, this change would somewhat dominate and change the character of this view for a short section of the Highway. | **Negligible** |

#### 7.4.5.2. Summary of impacts

*Views from publicly accessible roads*

There are only a few surfaced roads in this character area. The Duchess Dajarra Road, leading from the Barkly Highway south, and the Toolebuc McKinlay Road, leading from McKinlay south west towards Cannington. These roads are of minimal visual sensitivity, as they are minor scale roads providing access to the mining areas of the south west. There would be a view to the Project from the Duchess Dajarra Road, and while there would be a moderate magnitude of change seen from this road, due to the low sensitivity, there would be a **negligible** visual impact overall.

*Views from the railway*

The passenger and heavy rail follow a route from Cloncurry south west to the area in the vicinity of Duchess and then northwest to Mount Isa. For approximately one kilometre the railway runs parallel to the east of the Cloncurry Dajarra Road.

This route is of low visual sensitivity as it is a tourist route. As there would be a low magnitude of change expected in views over this short distance, there would be a **low** visual impact.

For the remainder of the route, however, there would be no views to the Project and a **negligible** visual impact to views from rail passengers travelling to Mount Isa between the Cloncurry Dajarra Road west.

### 7.4.6. Dajarra Road to Mount Isa

#### 7.4.6.1. Representative viewpoint Assessment

Figure 7.30 shows the location of the viewpoints which have been assessed within the Woodstock to Burra Range landscape character area.

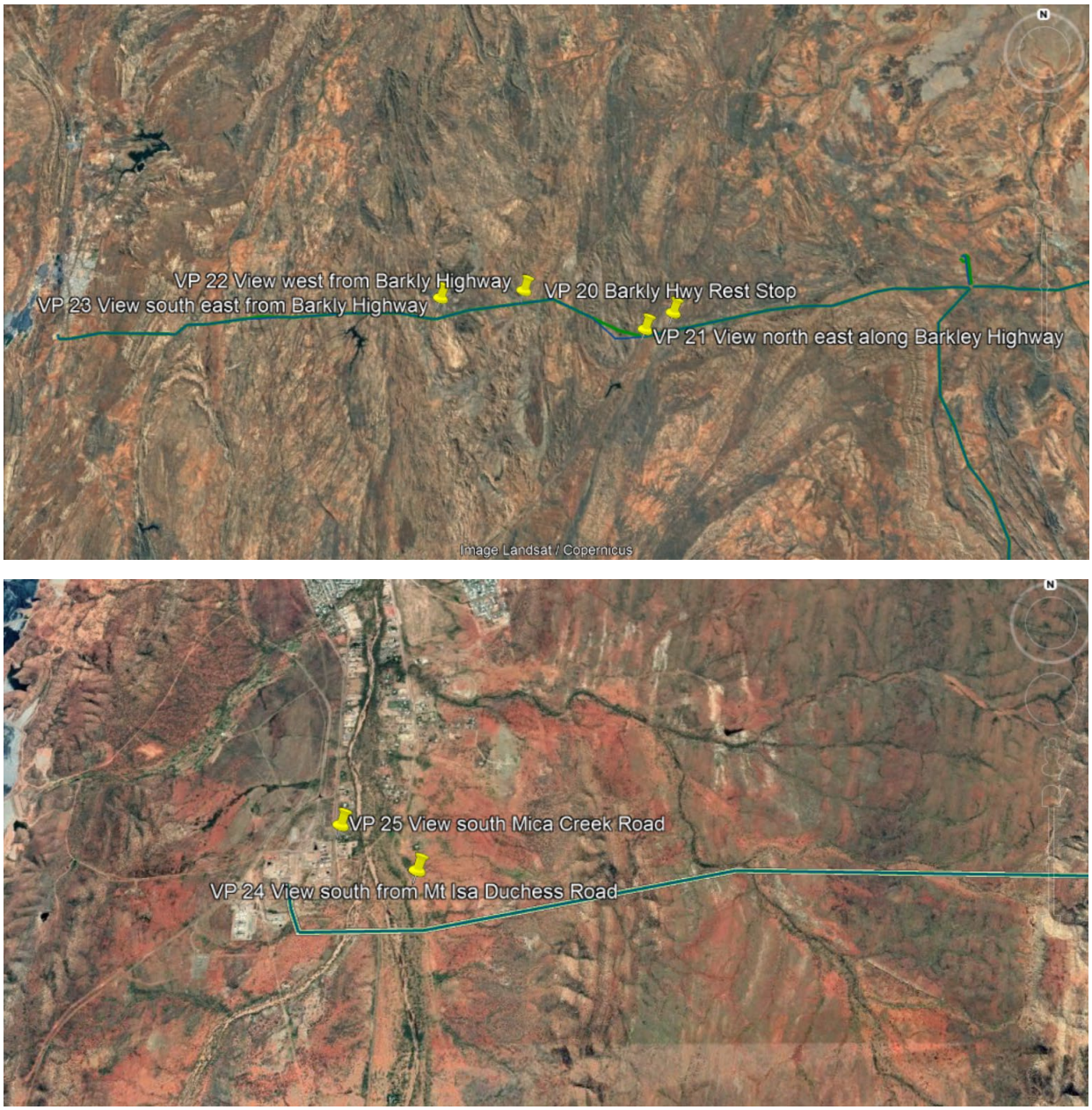



FIGURE 7-30 VIEWPOINT LOCATION PLAN – WOODSTOCK TO THE BURRA RANGE LANDSCAPE CHARACTER AREA

*Viewpoint 20: Barkly Highway rest stop, view southeast*

FIGURE 7-31 VIEWPOINT 20: BARKLY HIGHWAY REST STOP, VIEW SOUTHEAST

TABLE 7-21 VIEWPOINT ASSESSMENT - VIEWPOINT 20

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| The foreground includes the Cultural Heritage site and vehicle parking area, off the Highway. The Dense vegetation to the south of the Highway encloses this view, with some glimpses to the distant vegetated ridgeline.<br><br>The existing 66kv Duchess Road to Cloncurry transmission towers can be seen in the far background of this view (left of view). | **Low**<br>Indigenous Cultural Heritage site and rest stop located along the Barkly Highway, between Cloncurry and Mount Isa is a low use local attraction. | **Negligible**<br>• The Project would be located about 600 metres to the south of this view, aligned parallel to the existing power easement, and may be glimpsed in the background of view, rising above the roadside vegetation.<br>Overall, this change would be absorbed into the background of this view and not dominate or change the character of this view. | **Negligible** |

*Viewpoint 21: Barkley Highway, view north east*

FIGURE 7-32 VIEWPOINT 21: BARKLEY HIGHWAY, VIEW NORTH EAST

TABLE 7-22 VIEWPOINT ASSESSMENT - VIEWPOINT 21

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| Hills and undulating landform frame this view along the Highway. Blocks of vegetation and scattered trees form a backdrop and partly enclose this view, containing the visual catchment.<br>This view includes some existing 220kv transmission towers and line (Mica Creek power station to Chumvale substation), aligned at an oblique angle to the highway seen in the middle ground of view. | Low<br>The Barkly Highway is used by local residents, visitors and workers (e.g. commercial trucking vehicles, mining staff) travelling between Cloncurry and Mount Isa. | Low<br>▪ The Project would follow the alignment of the existing transmission easement.<br>▪ Towers and wires would be seen in the foreground of view, crossing the road.<br>▪ There would be some screening by intervening vegetation and landform, but the towers would also be seen rising above the skyline.<br>Overall, this change would not dominate or substantially change the character of this view. | Low |

*Viewpoint 22: Barkly Highway, view west*

FIGURE 7-33 VIEWPOINT 22: BARKLY HIGHWAY, VIEW WEST

TABLE 7-23 VIEWPOINT ASSESSMENT - VIEWPOINT 22

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| This view includes a highly varied landform with hills and undulating landform, and scattered trees.<br><br>The existing 66kv Duchess Road to Cloncurry towers can be seen in this section of the Highway (north and out of view) | Low<br><br>The Barkly Highway is used by local residents, visitors and workers (e.g. commercial trucking vehicles, mining staff) travelling between Cloncurry and Mount Isa. | Low<br><br>• The Project would cross the highway in the middle ground of this view.<br><br>• The towers would be seen against the skyline and contrast to the natural profile of the landscape.<br><br>• The varied landform and vegetation beside the highway would screen the lower sections of the towers.<br><br>Overall, this change would not dominate or substantially change the character of this view. | Low |

*Viewpoint 23: Barkly Highway rest stop, view south east*

FIGURE 7-34 VIEWPOINT 23: BARKLY HIGHWAY, VIEW SOUTH EAST

TABLE 7-24 VIEWPOINT ASSESSMENT - VIEWPOINT 23

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| A vegetated ridgeline and hills form a background to this view. There are two transmission lines located prominently on the ridgeline to the south of the highway, including the 220kv Mica Creek power station to Chumvale line (middle ground of view), and smaller 66kv Duchess Road to Cloncurry line (foreground of view) | Low<br>The Barkly Highway is used by local residents, visitors and workers (e.g. commercial trucking vehicles, mining staff) travelling between Cloncurry and Mount Isa. | Low<br>▪ The Project would be in the background of this view, about 900 metres to the south of the highway, on the elevated land in the background of this view.<br>▪ The Project would be seen amongst several existing transmission lines<br>▪ The towers would be partly screened by intervening vegetation but seen in part against the skyline.<br>Overall, this change would not dominate or substantially change the character of this view. | Low |

*Viewpoint 24: Mount Isa Duchess Road, view south*

FIGURE 7-35 VIEWPOINT 24: MOUNT ISA DUCHESS ROAD, VIEW SOUTH

TABLE 7-25 VIEWPOINT ASSESSMENT - VIEWPOINT 24

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| A vegetated ridgeline and hills form a background to this view. A large transmission tower rises prominently above the backdrop of hills and can be seen against the skyline. | Low<br><br>The Barkly Highway is used by local residents, visitors and workers (e.g. commercial trucking vehicles, mining staff) travelling between Cloncurry and Mount Isa. | Low<br>• The towers and wires would extend across the width of this view.<br>• The Project would be seen amongst several existing transmission lines<br>• The towers would be partly screened by intervening vegetation but seen in part against the skyline.<br>Overall, this change would not dominate or substantially change the character of this view. | Low |

*Viewpoint 25: Old Mica Creek Road, Mount Isa, view east*

FIGURE 7-36 VIEWPOINT 25: OLD MICA CREEK ROAD, MOUNT ISA, VIEW EAST

TABLE 7-26 VIEWPOINT ASSESSMENT - VIEWPOINT 25

| Viewpoint description | Visual Sensitivity | Magnitude of impact | Visual Impact |
|---|---|---|---|
| The existing Mica Creek power station dominates the foreground of this view. There are existing transmission lines in the background of this view. | **Minimal**<br>Old Mica Creek Road provides access to some local residences as well as to the Mica Creek power station.<br>It has a character dominated by the power infrastructure and is not a view of amenity value. | **Negligible**<br>• The proposed substation and transmission line (towers and wires) would be located in the background of this view.<br>• The existing infrastructure would obstruct views to the Project.<br>Overall, this change would not dominate or change the character of this view. | **Negligible** |

### 7.4.6.2. Summary of visual impacts

*Views from publicly accessible roads*

There are a number of locations along the Barkly Highway between Dajarra Road and Mount Isa where the Project would be visible. This roadway is a tourist route and is more highly trafficked as it collects travellers from both the Flinders and Landsborough Highways. This is generally an attractive and visually interesting landscape, although one which currently includes a large number of existing transmission lines of differing scales and alignments. Generally, the road meanders through the undulating landscape, reducing the likelihood of the Project's continuous visibility at any point.

Beginning at the intersection with the Cloncurry Dajarra Road, the alignment runs approximately 2.5 to 4 kilometres to the south of the highway for some 20 kilometres and would not be visible. There will be a negligible magnitude of change and a **negligible** visual impact.

Beyond this point, the alignment runs parallel with the Barkly Highway at approximately 300 to 500 metres south, for about 17 kilometres. In this area the towers would be seen following the alignment of several other transmission lines. This would include sections where the towers would be prominently located on local hills and ridges, and also partly screened by the intervening landform and vegetation

In these views the Project is often seen at an oblique angle to the viewer. On this route the Highway passes the Burke and Wills Memorial, and an Indigenous Cultural Heritage site from which there may be a distant glimpse to the Project. The Project is therefore considered to result in negligible to low magnitude of change and a **negligible** visual impact (refer Viewpoint 20).

About 40 kilometres west of the Dajarra Road, the transmission line crosses from southeast to northwest. At this point the transmission line is viewed from the Highway. There would be a low magnitude of change as the visible towers will be mitigated by being viewed against a hillside of patchy and varied vegetation, resulting in a camouflaging effect and reducing the contrast with the surrounding landscape. The view includes an existing transmission line and towers, however, the Project would include towers of a larger scale. Overall, there would be a **low** visual impact at this point (refer Viewpoint 21)

The transmission line would be located to the north of the highway and out of view for approximately 8 kilometres (about 10 kilometres by the highway), resulting in a **negligible** visual impact in this area.

The transmission line crosses the Barkly Highway again from east to west at a location approximately 50 kilometres west of the Dajarra Road (refer to Viewpoint 22). The transmission line would be viewed against the undulating landscape, but may be prominently located on elevated land and partly seen against the skyline. Where the corridor selection crosses the highway there would be a **low** visual impact.

Further west, at approximately 53 kilometres to the west of Dajarra Road, the Project comes to within 300 m of the Highway, and remains at close proximity (between 700 metres and 1.4 kilometres) for approximately 7 kilometres. From viewpoints in this vicinity there are several existing transmission lines seen from the highway. This existing infrastructure provides a precedent for the Project towers and while the Project may include some visually prominent elements, they would be seen within this context, and also partly obstructed by intervening vegetation and landform. This would result in a **low** visual impact overall (refer Viewpoint 23).

The Highway veers north, away from the alignment, which is some 5 to 10 kilometres to the south for the remaining 35 kilometres of the journey to Mount Isa, therefore resulting in a **negligible** visual impact in this area.

Mount Isa Duchess Road is a local road which leads south from Mount Isa and crosses the alignment. The Project would cross in a view which includes several existing transmission lines with prominent towers and overhead wires. While the towers would rise prominently above the landscape, views in this location have a high capacity to absorb the Project and there would be a **negligible** visual impact (refer Viewpoint 24).

Views from Old Mica Creek Road are dominated by the existing Mica Creek power station and several converging transmission lines. The sensitivity of this view is minimal and this view has the capacity to absorb further development of this scale and character. Overall, there would be a **negligible** visual impact (refer Viewpoint 25) in views from this location.

*Views from the railway*

The railway does not follow the corridor selection through this area.

*Views from townships*

The corridor selection runs approximately 5 kilometres to the south of Mount Isa. There are several residential properties in Mica Creek that will be addressed in section 7.5 of this assessment (Views from buildings on private properties).

## 7.5. Views from buildings on private property

The following section will consider the potential views to the Project from private properties. This assessment considers properties located within the 5 km study area and from greater distances if there is a potential for there to be a view impact.

*Woodstock to the Burra Range*

Between Woodstock and the Burra Range there are small number of homesteads which have the potential to have a view of the Project, these include:

- A homestead on Avocavale Road (Glenelle North) about 2 km from the corridor selection
- A homestead to the east of Silver Valley Road, about 700 m from the corridor selection
- A homestead on Rochford Road (Silver Valley) about 1.7 km to the north of the corridor selection
- Two homesteads to the south of Charters Towers on Mount Leyshon Road about 1.7 km and 900 metres from the corridor selection
- A homestead on River View Road (River View), southeast of Pentland, about 1.8 km from the corridor selection.

Due to what are mostly distances of over 1.5 km, as well as the undulating landform and vegetation cover in the Woodstock to Burra Ranges landscape character area, these properties are unlikely to have views to the Project.

From properties which are closer to the alignment, the closest being at a distance of about 700 metres, it is also expected that the vegetation and undulating landform would reduce the visibility of the Project so that if it is seen, the Project would not result in a significant view impact.

In views from the properties homesteads on Mount Leyshon Road, south of Charters Towers, any view to the Project would be seen in the context of the existing Millchester-Mount Leyshon 66 kV transmission line, which crosses the corridor selection at Mount Leyshon Road.

Overall, due to the distance, intervening landform and vegetation, the Project is likely to be absorbed into the background of views from these properties. Overall, it is expected that there would be low to negligible visual impact on views from these residences.

Refer to Figure 7-37 for the location of these properties.

*Hughenden to Richmond and surrounds*

Between Hughenden and Richmond there are small number of homesteads which have the potential to have a view of the Project, these include:

- A homestead, south of the Flinders Highway, about 2 kilometres west of the corridor selection and the proposed Hughenden substation
- A homestead on the Kennedy Developmental Road, south of Hughenden, about 1 km from the corridor selection
- A homestead west of the Kennedy Developmental Road (Renfrow Park), 1.5 km south of the corridor selection
- A homestead south of the corridor, between Boree and Mumu, (Cannonball), 2.5 km south of the corridor selection
- A homestead south of Marathon, east of Marathon Stamford Road, about 1.2 kilometres south of the corridor selection
- A homestead south of Moselle, about 1.8 km north of the corridor selection

From the property south of the Flinders Highway, in the vicinity of the Hughenden substation, due to the more open landscape,

there would potentially be a view to the Project from this property, as well as a view to the wind turbines at Kennedy Energy Park, located about 4 kilometres to the south.

The properties located south of Hughenden, along Kennedy Development Road would view the Project in the context of the existing Hughenden-Winton 66 kV transmission infrastructure, which would intercept the corridor selection northwest of Kennedy Development Road. There are also views to other powerlines including smaller single poles proving power to the remote homesteads via local roads and crossing fields.

While the landscape is largely flat and open, with limited vegetation to screen views, the vastness of the landscape and long distances would reduce the potential impact of the Project.

Due to this context and viewing distances, the Project is likely to be absorbed into the background of views from these homesteads. Overall, it is expected that there would be low to negligible visual impact on views private properties.

*Julia Creek and surrounds*

Between Hughenden and Richmond there are small number of homesteads which have the potential to have a view of the Project, these include:

- A homestead south of Richmond, on Richmond Winton Road, about 1.2 km north of the corridor selection
- A homestead on an unnamed road between Richmond and Maxwelton, about 1.8 km south of the corridor selection
- A homestead (Bundoran) south of Nonda, and 1.8 km north of the corridor selection
- A homestead (Alexmere) south of Nelia, on Minamere Nelia Road about 1.8 km from the corridor selection
- Two houses on a property on Proa Road about 2 km south of the corridor selection.

While the landscape is broad and open in this character area, due to the large distances, the Project is likely to be absorbed into the background of views from these properties. Overall, it is expected that there would be low to negligible visual impact on views from these residences.

*Cloncurry and surrounds*

There are a small number of private residences which may have a view to the Project in the Cloncurry and surrounds landscape character area. These include:

- A homestead to the southeast of Clonclurry, on Round Oak Road, about 2 km south of the corridor selection
- Five houses to the south of Cloncurry, on Roxmere Road, about 1 km north of the corridor selection.

Any views to the Project would be seen in the context of the existing industrial and mining uses, including several other transmission lines. Due to the landform and vegetation cover in this area, and large distances, the Project is not likely to be prominent in views from these properties. Overall, it is expected that there would be low to negligible visual impact on views from these residences.

*Dajarra Road to Selwyn Substation, Cannington and Phosphate Hill*

No homesteads were identified within the vicinity of the corridor selection between Dajarra Road and Selwyn Substation, Cannington and Phosphate Hill.

*Dajarra Road to Mt Isa*

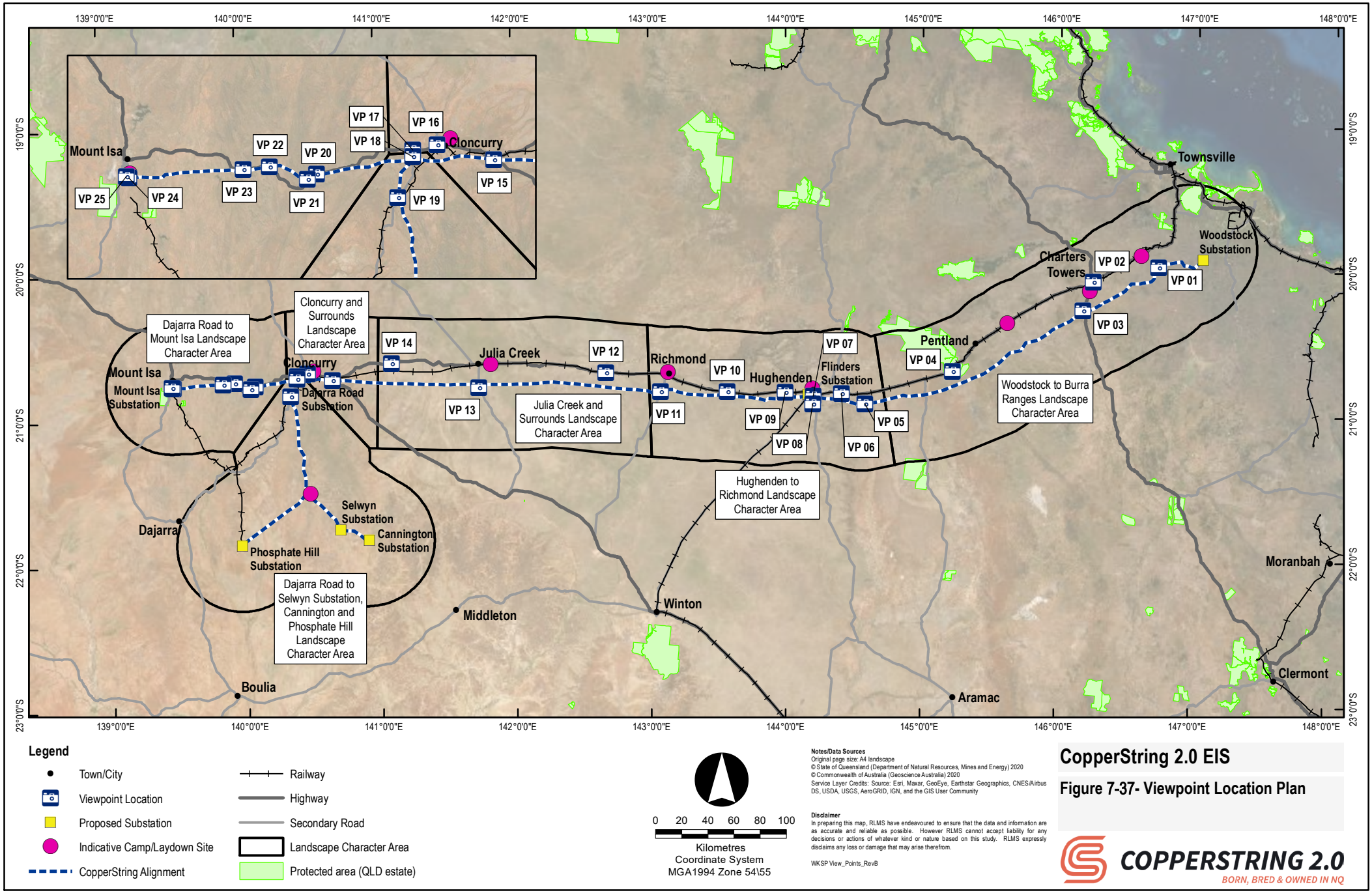
There are no private residences within the study area between Dajarra Road and the eastern outskirts of Mount Isa. However, as the corridor selection nears Mount Isa, there are a few residences at Mica Creek that are within the study area and may experience a visual impact. This includes:

- A house east of Duchess Creek Road, about 800 metres north of the corridor selection
- Four properties along Mica Creek Road, which are about 750 metres from the corridor selection
- Seven properties on Tecoma Street, about 150 metres and 300 metres from the corridor selection.

There would be some screening by intervening vegetation, however, these views are characterised by the existing large scale infrastructure which is located in this area, including existing transmission lines, the Mica Creek and Diamantina power stations.

While the Project may be visible from these properties, the Project would not dominate or alter the character of these views. Overall, it is expected that there would be low to negligible visual impact on views from these residences.

Refer to Figure 7-37 for the location of these properties.




**Legend**

- Town/City
- Viewpoint Location
- Proposed Substation
- Indicative Camp/Laydown Site
- CopperString Alignment
- Railway
- Highway
- Secondary Road
- Landscape Character Area
- Protected area (QLD estate)

0 20 40 60 80 100

Kilometres

Coordinate System
MGA1994 Zone 54\55

**Notes/Data Sources**
Original page size: A4 landscape
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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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WKSP View_Points_RevB

# CopperString 2.0 EIS

## Figure 7-37- Viewpoint Location Plan

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ

## 7.6. Assessment of Construction Program

During construction of the Project a range of construction equipment and activities will be visible including: the gradual clearing of the easement; construction and use of construction laydown areas; construction of access roads; erection of the towers; stringing of the lines, and the erection of the electrical equipment comprising the substations.

Each of these activities would be visible for a short duration and will occur consecutively over a construction period of approximately 18-24 months.

Erection of the towers and stringing of the line would be contained within the visual catchment of the Project, which has been assessed in the above discussion of impacts of the Project. Additional impacts, not already identified in this assessment include those related to the construction of those sites associated with construction that will be removed upon completion such as the construction laydown areas, concrete batching plants and pulling and tensioning sites. Furthermore, the transport of equipment using the Highways and other public roads, and finally the construction camps that would house the workforce, these impacts will each be considered in the following paragraphs.

*On-line construction activities*

Temporary construction laydown/delivery areas would be required to construct the Project. These laydown/ delivery areas will be approximately 500 x 500 m in size when located at substations, and 250 x 250 m adjacent to the line. Each of these sites would require some clearing of vegetation, construction of access roads and security fencing.

Pulling and tensioning sites would also be required approximately every 4-5 kilometres along the route.

There will be a cleared area of approximately 100 x 100 metres in size, located within the transmission line corridor and may include some incidental grading to create level pads for equipment.

Each of these elements would be located within the bounds of the Project alignment. In this context of intensive construction activity, the magnitude of change seen in views is likely to be low and result in a low impact in views. This relates particularly to those views available at a distance where the potential visibility of construction activity would be reduced by intervening landform and vegetation, and distance.

Where these elements are viewed at close proximity, such as at road crossing points, there may be some areas where a moderate magnitude of change is experienced. As most location where the Project would be seen in close proximity are of low to minimal sensitivity, this would result in a low visual impact.

These impacts would be short term as these sites will be removed and remediated at the conclusion of the construction activities.

*Transportation of materials and equipment*

From Townsville, it is envisaged that movement of construction materials to lay-down areas will be generally transported via road trains along the Flinders or Barkly Highways, or by rail along the Mount Isa Rail Line.

The Flinders and Barkly Highways are of low visual sensitivity. The additional traffic associated with construction would be absorbed into the already heavily trafficked by road trains and other large vehicles supporting to the mining and agricultural activities of the region. Generally, this would result in a negligible magnitude of change from low sensitivity viewing locations, and there would be a negligible visual impact on the Highways of the region.

Several local routes of low visual sensitivity would also be used to transport materials and equipment during the construction phase. These activities would result in a negligible magnitude

of change and there would be a **negligible** visual impact caused by additional traffic on the local routes of the region.

*Accommodation Camps*

The Project would be divided into several construction zones, each serviced by a central accommodation camp and Project office. This is likely to include camps at Woodstock, Charters Towers, Pentland, Hughenden, Richmond, Julia Creek, Cloncurry, Selwyn substation and Mount Isa as required.

Each camp would include demountable accommodation units for up to 350 persons. A mixed fleet of 4WD vehicles. These facilities would typically be located on the outskirts of a township or near the construction zone.

Due to the introduction of temporary buildings and associated infrastructure, roads, equipment and vehicle activity, lighting etc. it is expected that at each camp location there will be a low magnitude of change experienced in views.

Where the camp site is located on the outskirts of a town, in an existing area of rail and transmission line or existing industrial area, there is likely to be a **negligible** visual impact.

Sites where there is greater visibility, or the site is located within a scenic landscape, or where the site is viewed from a scenic route or lookout, there would likely be a **low** visual impact.

Any impacts associated with the camps would be temporary in nature, creating impact for the duration of the construction period, including construction and remediation of the camps themselves. Following the remediation of each site, these visual impacts will be reduced to **negligible**.

## 7.7. Assessment of Lighting Effects

At night the study area is predominantly dark with lit areas being mainly at townships. The highways, roads and railways of the study area are generally not lit outside of the towns and stations. The larger towns of Charters Towers, Cloncurry and Mount Isa would be the brightest areas of the landscape, emitting the greatest amount of light and skyglow.

There would be limited additional lighting introduced into the landscape by the Project. There would be no lit elements associated with the transmission line itself or the substations. However, the construction process will require some lighting.

Generally, the working hours of the construction would be during daylight hours, that is between 6:30 am and 6.30 pm, or earlier during summer months. However, the laydown/delivery areas would be functioning up to 24 hours a day, seven days a week. To accommodate potential after hours deliveries, lighting would be provided at each laydown/delivery. These areas would be located along the alignment and at each substation site, mostly outside township centres, and would contrast with the surrounding predominant dark landscape.

There would also be lighting associated with the workforce accommodation camps, which would be located near major towns if possible. However, if these camps are located close to the corridor selection, there would be the potential for brightly lit facilities which contrast with the surrounding predominantly dark landscape.

These camps would be temporary, and all lighting would be removed upon completion of construction.

Overall, in urban areas the Project would create a negligible to low magnitude of change and a **negligible** to **low** visual impact during construction. In predominantly dark areas, there would be a moderate magnitude of change at night and a **low** visual impact.

# 8.0 Summary of Visual Impacts

In summary, considering the length and scale of this Project, there are relatively few visual impacts. Those visual impacts which have been identified mostly having a **low** to **moderate** visual impact. These impacts are listed in Table 8-1.

TABLE 8.1 SUMMARY OF VISUAL IMPACTS

| No. | Location | Visual sensitivity | Magnitude of change | Visual impact |
|---|---|---|---|---|
| **Woodstock to the Burra Range** | | | | |
| 1 | Burdekin Falls Dam Road, view north | Low | Moderate | Low |
| 2 | Tower Hill Lookout, Charters Towers, view south | Moderate | Negligible | Negligible |
| 3 | Gregory Developmental Road, view south | Low | Moderate | Low |
| 4 | Ju Ju's lookout, White Mountains National Park, view south | Moderate | Negligible | Negligible |
| **Hughenden to Richmond and surrounds** | | | | |
| 5 | Prairie Muttaburra Road, view south | Minimal | Moderate | Negligible |
| 6 | Flinders Highway, east of Hughenden, view south | Low | Moderate | Low |
| 7 | Hughenden Muttaburra Road, view south | Low | Moderate | Low |
| 8 | Mount Walker, Hughenden, view north | Moderate | Low | Low |
| 9 | Flinders Highway, west of Hughenden, view south | Low | Low | Low |
| 10 | Flinders Highway rest stop at Marathon, view south | Low | Low | Low |
| **Julia Creek and surrounds** | | | | |
| 11 | Richmond Winton Road, view south | Low | High | Moderate |
| 12 | Maxwelton rest stop, Flinders Highway, view south | Low | Negligible | Negligible |
| 13 | Julia Creek Kynuna Road, view south | Minimal | Moderate | Negligible |
| 14 | Julia Creek–Cloncurry rest stop, Flinders Highway, view south | Low | Negligible | Negligible |
| **Cloncurry and surrounds** | | | | |
| 15 | Landsborough Highway, view north | Low | Moderate | Low |
| 16 | Chinaman Creek Dam Recreation Area lookout | Moderate | Negligible | Negligible |
| 17 | Cloncurry Dajarra Road, view south | Minimal | Low | Negligible |
| **Dajarra Road to Selwyn Substation, Cannington and Phosphate Hill** | | | | |
| 18 | Cloncurry Dajarra Road, view south | Minimal | Moderate | Negligible |
| 19 | Cloncurry Dajarra Road, view north east | Minimal | Low | Negligible |
| **Dajarra Road to Mount Isa** | | | | |
| 20 | Barkly Highway rest stop, view southeast | Low | Negligible | Negligible |
| 21 | Barkley Highway, view north east | Low | Low | Low |
| 22 | Barkly Highway, view west | Low | Low | Low |
| 23 | Barkly Highway rest stop, view south east | Low | Low | Low |
| 24 | Mount Isa Duchess Road, view south | Low | Low | Low |
| 25 | Old Mica Creek Road, Mount Isa, view east | Minimal | Negligible | Negligible |

# 9.0 Mitigation and management measures

There are few mitigation techniques that can reduce the visual impacts of this Project due to the size of the towers, length of the Project and character of the infrastructure. Furthermore, the location of the corridor selection has already anticipated visual amenity in refining the alignment.

Currently, the corridor selection route minimises the number of intersections with other infrastructure, which would require the use of taller towers, and has avoided towns along the alignment by running a distance to the south of the Flinders Highway. The corridor selection route has been modified since the final corridor from 2010, to minimise intersections with current farm infrastructure, mapped 'of concern' ecosystems and cultural heritage places.

Subject to other technical design considerations, there is some limited scope to consider the placement of towers at critical locations, as well as some vegetative screening to substations and maintenance areas. These opportunities are described in the following paragraphs.

## 9.1. Location of towers

Towers can be located so that they are at the maximum distance from sensitive viewpoints, so that they are viewed against a more visually absorptive background or so that intervening landform will block views, for example.

Where possible, towers can be located greater than 50 m from the road corridor boundary at a maximum spacing (between 400 - 500 m) and from visually sensitive roadways or viewing locations. This would be a suitable mitigation technique for roads such as Hughenden Muttaburra Road (viewpoint 7), outside of Hughenden, and Richmond Winton Road, outside of Richmond (viewpoint 11). In these locations there is no landform to provide screening, and screening vegetation would not be appropriate for the landscape character of the area. Also, where these roads are visible for a long duration, such as at Richmond Winton Road, the symmetry of the towers in relation to the roadway, and potential regular spacing of these towers, would reduce the visual contrast with the broad open plains of the surrounding landscape.

Views from the Flinders Highway Rest Stop at Marathon (refer Viewpoint 10), where the Project cuts from east to west across the view, would also benefit from a regular visual rhythm created by the consistent spacing of towers across the relatively flat open landscape, where technically feasible.

Views from the Landsborough and Barkly highways would benefit from the sensitive placement of the towers to maximise the screening effects of the undulating landform and vegetation. Distance from the viewer is important in this setting, whereas the symmetry of towers will have less of an effect in this location due to the meandering route of the highways through this area.

In addition, at the transmission line crossing points along the Barkly Highway, the location of towers should be carefully considered to ensure they are located to minimise the visual impact in these visually sensitive locations. The placement of towers should consider the maximum distance of the tower from the roadway, the southern tower should be hidden behind the intervening ridgeline, and the northern tower should be viewed against the distant hillside where possible (refer Viewpoints 20-24).

When seen adjacent to other existing transmission lines, such as in views along the Barkly Highway, having a similar tower spacing and aligning the corridor parallel to the existing lines would assist in the absorption of the Project into views without creating a visually jarring and overdeveloped visual effect.

## 9.2. Vegetative screening

Vegetative screening will have a limited effect in mitigating the visual impacts of the Project due to the height of the towers and scale of the substations. For example, at Richmond Winton Road and Julia Creek Kynuna Road, views to the towers and wires would be unobstructed and seen rising prominently above the surrounding landscape and viewed against the sky, with little opportunity for screening due to the flat, open rural character (refer Viewpoints 11 and 13).

However, it is recommended that some screening be considered to mitigate impacts at key locations. Primarily the low visual impacts expected at views from the Flinders Highway and Cloncurry Dajarra Road could be reduced by screening of the substations. This screen planting would need to be designed to appear as an informal block of vegetation, similar to that occurring naturally on the surrounding plains (refer Viewpoints 6 and 18). Similarly, the planting of vegetation along the Flinders Highway may be used to reduce the visibility of the Hughenden substation in views from Mount Walker (refer Viewpoint 8).

## References


Burdekin Shire Council, 2011, *Burdekin Planning Scheme 2011*, URL: https://www.burdekin.qld.gov.au/downloads/file/1111/burdekin-shire-council-ipa-planning-scheme (accessed 22/10/2019).

Charters Towers Regional Council, 2020, *Charters Towers Regional Town Plan*, URL: http://www.charterstowers.qld.gov.au/ctrc-planning-services (accessed 16/06/2020).

City of Mount Isa Council, 2020, *City of Mount Isa Planning Scheme 2020 URL:* https://www.mountisa.qld.gov.au/town-planning-schemes (accessed 16/06/2020).

Cloncurry Shire Council, 2016, Cloncurry Shire Planning Scheme, URL: http://www.cloncurry.qld.gov.au/planning-services (accessed 22/10/2019).

Flinders Shire Council, 2017, *Shire of Flinders Planning Scheme 2017*, URL: http://www.flinders.qld.gov.au/building-and-planning (accessed 22/10/2019).

QLD Department of Infrastructure and Planning, 2010, *North West Regional Plan 2010-2031*, URL: http://rdanwq.org.au/files/resources/nw-regional-plan-web-full.pdf (accessed 22/10/2019).

QLD Department of State Development, Manufacturing, Infrastructure and Planning, 2020, *North Queensland Regional Plan*, URL: https://planning.dsdmip.qld.gov.au/planning/better-planning/state-planning/regional-plans/north-queensland-regional-plan (accessed 16/60/2020).

McKinlay Shire Council, 2019, *McKinlay Shire Planning Scheme 2019*, URL: https://www.mckinlay.qld.gov.au/planning-development (accessed 22/10/2019).

Richmond Shire Council, 2005, *The Richmond Shire Council Planning Scheme 2005*, URL: https://www.richmond.qld.gov.au/council/council-publications (accessed 22/10/2019).

Townsville City Council, 2019, Townsville City Plan 2019, URL: *https://www.townsville.qld.gov.au/building-planning-and-projects/planning-and-building-approval/planning-guidelines-and-tools/city-plan-planning-scheme* (accessed 22/10/2019).