APPENDIX F

LANDSCAPE AND VISUAL AMENITY REPORT

iris

EnergyConnect (Victorian Section)

Visual and landscape character impact assessment

April 2021

Contents

Glossary

Term	Definition
Amenity	'The pleasantness of a place as conveyed by desirable attributes including visual, noise, odour etc.' (Australian Institute of Landscape Architects QLD 2018)
Character	'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, and often conveys a distinctive 'sense of place'. This term does not imply a level of value or importance.' (Australian Institute of Landscape Architects 2018)
Construction footprint	For references to area of land on which works are proposed.
Cultural Landscape	A cultural landscape is a physical area with natural features modified by human activity resulting in patterns of evidence layered in the landscape. These layers give a place its distinctive spatial, historical, aesthetic, symbolic and memorable character. Within cultural landscapes there are areas where human impact is more obvious. These places '…may include components, contents, spaces and views' (Murray–Darling Basin Authority, 2019).
Disturbance area	Refers to the area that would be directly impacted by both construction and operation (including the areas that would be impacted by maintenance activities) of the proposal including all proposal infrastructure elements (including the proposed transmission line alignment, i.e. the operational footprint) as well as locations for currently proposed construction elements such as access tracks, laydown and staging areas, brake/winch sites.
Glare	'Condition of vision in which there is discomfort or a reduction in ability to see, or both, caused by an unsuitable distribution or range of luminance, or to extreme contrasts in the field of vision.' (AS4282:2019)
Landscape	'Landscape is an all-encompassing term that refers to areas of the earth's surface at various scales. It includes those landscapes that are: urban, peri-urban, rural, and natural; combining bio-physical elements with the cultural overlay of human use and values.' (Australian Institute of Landscape Architects 2018)
Landscape and visual study area	An area which includes the visual catchment of the proposal and extends to approximately three kilometres from the centreline of the proposal.
Magnitude	'The extent of change that will be experienced by receptors. This change may be adverse or beneficial. Factors that could be considered in assessing magnitude are: the proportion of the view / landscape affected; extent of the area over which the change occurs; the size and scale of the change; the rate and duration of the change; the level of contrast and compatibility.' (Australian Institute of Landscape Architects 2018)
Operational footprint	Refers to the areas where the physical infrastructure would be located and the areas where the operational activities would occur. This includes all proposed infrastructure elements such as the proposed transmission line (overhead) and structures, any new substation infrastructure or permanent access tracks. This also includes the corridor containing the transmission line which would require vegetation maintenance (50 metres in width).

Term	Definition
(the) proponent	The proposal is proposed to be undertaken by NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (referred to as TransGrid). TransGrid is the operator and manager of the main high voltage (HV) transmission network in NSW and the Australian Capital Territory (ACT), and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015* (NSW).
(the) proposal	The proposal is known as '*EnergyConnect (Victoria)*' The proposal involves the following key features: - construction of about 1.3 kilometres of new double circuit 220kV transmission line, with four new transmission line pole locations. At two of these locations, two poles would be installed. At the remaining locations only a single pole would be installed - the decommissioning and removal of the existing transmission line and towers - the establishment of a formal 50 metre wide corridor for the new transmission line - upgrade of access tracks for use during construction and operation - establishment of small sections of new access tracks. The description of the proposal as presented in the reports is indicative and based on the current level of design. The proposal would continue to be refined during detailed design.
Proposal footprint	Refers to the area that would be directly impacted by both construction and operation (including the areas that would be impacted by maintenance activities) of the proposal including all proposal infrastructure elements (including the proposed transmission line alignment, i.e. the operational footprint) as well as locations for currently proposed construction elements such as access tracks, laydown and staging areas, brake/winch sites.
Proposal study area	The study area for the assessment in this report generally comprises a 200m wide corridor between NSW/Victoria border at Monak and the Red Cliffs substation facility. It also encompasses the Red Cliffs substation facility and access track off Woomera Avenue into the proposal area. The proposal would be located within the proposal study area, however the entirety of the proposal study area would not be subject to direct impacts arising from the proposal. Some technical assessments will have an additional study area specific to the methodologies of the assessment (e.g. for database searches, or areas of influence due to nature of the impacts). Such areas, where required, have been clearly defined in the specific report.
Sense of place	Is the intangible qualities and character of a place, interpreted and valued by people.
Sensitivity	'Susceptibility of a landscape or receptor to accommodate change without losing valued attributes.' (Australian Institute of Landscape Architects 2018)
Sky glow	'The brightening of the night sky that results from radiation (visible and non-visible), scattered from the constituents of the atmosphere (gaseous, molecules, aerosols and particulate matter), in the direction of observation.' It comprises Natural sky glow and artificial sky glow. (AS4282:2019)
Spill light	'Light emitted by a lighting installation that falls outside of the design area. Spill light may or may not be obtrusive depending on what it affects' (AS4282:2019)
Transmission line corridor	An area up to 50 metres wide containing and directly beneath the transmission lines and other infrastructure in which TransGrid has rights to enter to access and maintain infrastructure and vegetation.

Term	Definition
Values	'Any aspect of landscape or views people consider to be important. Landscape and visual values may be reflected in local, state or federal planning regulations, other published documents or be established through community consultation and engagement, or as professionally assessed.' (Australian Institute of Landscape Architects 2018)
View	'Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features.' (Australian Institute of Landscape Architects 2018)
Viewpoint	'The specific location of a view, typically used for assessment purposes.' (Australian Institute of Landscape Architects 2018)
Visual absorption capacity	'The potential for a landscape or scene to absorb a particular change without a noticeable loss of valued attributes.' (Australian Institute of Landscape Architects 2018)

Executive summary

The proposal

TransGrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity transmission operator in South Australia (SA)) are seeking regulatory and environmental planning approval for the construction and operation of a new High Voltage (HV) interconnector between NSW and SA, with an additional connection to Red Cliffs in north-west Victoria (VIC). Collectively, the proposed interconnector is known as EnergyConnect.

EnergyConnect comprises several components or 'sections' (shown on Figure 1-1). The Victorian section (referred to as 'the proposal') is the subject of this report and includes upgrade of the 220 kilovolt (kV) transmission lines between the NSW/VIC border and Red Cliffs substation facility.

Approach to this landscape and visual impact assessment

The assessment considers a landscape and visual study area which extends beyond the proposal study area to include areas where there would be views to the proposal. This assessment identifies the landscape character of the landscape and visual study area and considers views from within this area.

This assessment identifies the potential landscape and visual impact of the proposal during the day and at night, for the period of construction and operation. GIS analysis, photomontages and cross sections have been developed to analyse and communicate the potential visibility of the proposal to assist in the interpretation of visual impact.

Landscape impact

The landscape and visual study area includes landscapes of local and regional landscape sensitivity which would be directly impacted by the removal of vegetation and changes to the character of recreational areas as a result of the proposal. Overall, these impacts would be low during construction and operation of the proposal. This is due to the relatively small area of direct impact with the proposal replacing and being located alongside an existing corridor, and within the context of other existing electricity infrastructure. The proposal would require some vegetation clearing and trimming but minimal landform changes. The proposal avoids impacts upon the important landscape features, by being set back from the river edge and the distinctive red cliffs. Those visual impacts which have been identified have a **low landscape impact** during construction, and **low landscape impact** during operations. There would be no direct impact upon the regionally sensitive landscapes of the Red Cliffs Scenic Reserve, and therefore a **negligible landscape impact** during operation.

Visual impact

Overall, the visual impacts of the proposal are relatively low and have a relatively small influence as there are a relatively small number of receptor locations.

During construction there would be **negligible** to **low visual impacts** from the Red Cliffs Scenic Reserve. The low impact would be experienced from the viewing platform where the view is of greater sensitivity and the vantage point provides greater visibility of the proposal. There would also be **low visual impact** experienced in views from the residential properties on Woomera Avenue, from the recreational areas and tracks within the Kings Billabong Park, in views from vessels within the Murray River and in views from the air.

This low impact is mainly due to the removal of vegetation at each structure location and the trimming of vegetation within in the transmission line corridor and scale of the machinery and transmission line structures, which would be seen rising above the vegetation which surrounds the transmission line corridor. These impacts would be temporary and for a reasonably short duration.

During operations there would be a **low visual impact** in views from the Red Cliffs Scenic Reserve lookout, from within the Kings Billabong Park and from the Murray River. This impact would be due to the larger scale of the transmission line structures, which would be taller and have a greater visual mass.

Visual impacts at night

At night there would be a **low visual impact** during construction of the proposal. This would be due to works extending to 7pm on a daily basis and the short duration when there would be lighting required along the transmission line construction areas. During operations this would reduce to a **negligible visual impact** as there is no permanent lighting proposed.

Mitigation measures

There are opportunities for landscape and visual mitigation during both construction and operation of the proposal. This would include detailed construction planning to minimise impacts on vegetation where feasible and maintain park access for recreational users during construction.

1. Introduction

1.1. Proposal context and overview

TransGrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity transmission operator in South Australia (SA)) are seeking regulatory and environmental planning approval for the construction and operation of a new High Voltage (HV) interconnector between NSW and SA, with an additional connection to Red Cliffs in north-west Victoria. Collectively, the proposed interconnector is known as EnergyConnect.

EnergyConnect comprises several components or 'sections' (shown on Figure 1 1). The Victorian Section (referred to as 'the proposal') is the subject of this report.

EnergyConnect aims to secure increased electricity transmission between SA, NSW and Victoria in the near term, while facilitating the longer-term transition of the energy sector across the National Electricity Market (NEM) to low emission energy sources.

EnergyConnect has been identified as an immediate priority project in the Australian Energy Market Operator (AEMO) *2018 Integrated System Plan* (ISP) and a 'no regret' actionable project in the 2020 ISP (AEMO, 2020). This is due to its ability to 'increase transfer capacity between SA and NSW by 750 MW, achieve fuel cost savings and unlock already stranded renewable investments' within the REZs in western NSW, SA and north-west Victoria (AEMO, 2020).

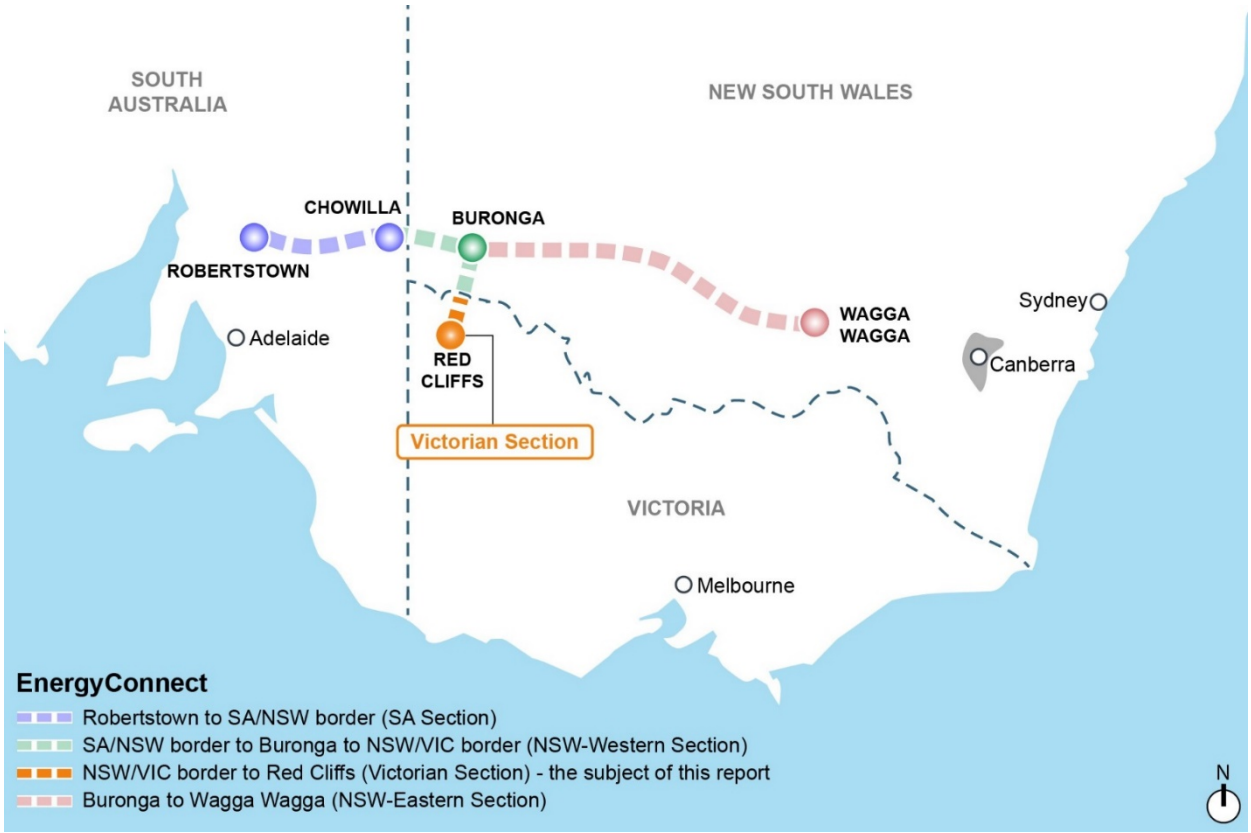

FIGURE 1-1: OVERVIEW OF ENERGYCONNECT

1.2. The Proposal

1.2.1. Approvals Pathway

TransGrid are seeking approval from Mildura Rural City Council for the upgrade of an existing TransGrid 220kV single circuit transmission line to a 220kV double circuit transmission line within a 50-metre-wide corridor that extends for approximately 1.3 kilometres. The proposal is located within a Public Conservation and Resource Zone (PCRZ).

The proposal requires primary State planning, environmental and Aboriginal heritage approvals under the Planning and Environment Act 1987, and Aboriginal Heritage Act 2006. The proposal seeks to lodge planning and environmental approvals through a planning permit to the Mildura Rural City Council and a Cultural Heritage Management Plan to the First People of Millewa Mallee Aboriginal Corporation for assessment.

1.2.2. Key features of the proposal

The proposal comprises the upgrade of an existing TransGrid 220kV single circuit transmission line between the NSW/Victorian border and the Red Cliffs substation to a 220kV double circuit transmission line. Specifically this comprises:

- site establishment works including vegetation clearance, minor access track improvements and construction of tower pad and laydown areas
- construction of about 1.3 kilometres of new double circuit 220kV transmission line, with four new transmission line pole locations. At two of the four locations, a double arrangement (i.e. two poles) would be installed. At the remaining locations only a single pole structure would be installed
- the decommissioning and removal of the existing 220kv single circuit transmission line and towers once the new line is operational. Decommissioning activities would include removal of all existing towers, fittings and conductors from the corridor. Some sub surface footings would be left in place to minimise excavation and disturbance.
- the establishment of a formal 50 metre wide corridor for the new transmission line and poles
- vegetation removal required to maintain appropriate clearances between ground vegetation and transmission lines. Vegetation with growth height greater than four metres in height, within a 50-metre corridor below transmission lines would require ongoing maintenance throughout the operation to ensure electrical safety clearances and protection zones are maintained.
- upgrade of access tracks for use during construction and operation
- establishment of small sections of new access tracks.

The connection of the new transmission line to the Red Cliffs substation and disconnection of existing transmission line within the substation boundary would be undertaken as a separate scope of works and planning approvals process by AusNet.

The new line would also connect to a new line on the NSW side of the border (part of the NSW – Western Section of EnergyConnect). The planning approvals for this component are being progressed separately under NSW planning processes.

An overview of the proposal is provided in Figure 1-2. The final location of transmission poles and transmission line corridor would be confirmed during detailed design.

Construction of the proposal would commence in late-2021. Construction timeframes for the proposal are subject to approvals, and the final program would be confirmed during detailed design.

1.2.3. Proposal location and study area

The proposal is located in the Kings Billabong Park, Red Cliffs, in the Sunraysia region within the Mildura Local Government Area and approximately 16 kilometres from Mildura and 544 kilometres from Melbourne respectively.

The proposal study area comprises of a 200 metre wide corridor that extends for about 1.3 kilometres and extends from the Red Cliffs substation to the north-east where it meets the Victorian/NSW border at the Murray River. The proposal study area comprises approximately 33.15 hectares of land and follows the existing 220kV transmission line corridor and also encompasses the Red Cliffs substation facility and access track into the proposal study area (see Figure 1-2).

The bulk of the proposal study area is classified as Crown Reserve with the remainder typically freehold land.

1.2.4. Proposal need

The proposal would increase transfer capacity between the state markets of Victoria and NSW and would supports the establishment of the missing transmission link between the SA and NSW transmission networks. The upgrade to the existing transmission line between Buronga and Red Cliffs would relieve system constraints and allow for Victorian, NSW and SA consumers to benefit from expanded access to low-cost, large-scale solar generation in north-west Victoria and south-west NSW.

The proposal is an essential component of EnergyConnect.

1.3. The proponent

The proposal would be carried out by NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (referred to as TransGrid). TransGrid is the operator and manager of the main high voltage transmission network in NSW and the Australian Capital Territory (ACT) and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015* (NSW).

1.4. Purpose of this technical report

IRIS Visual Planning and Design has been commissioned by WSP on behalf of TransGrid to prepare the Landscape and Visual Impact Assessment to support the statutory planning approvals for the proposal. The purpose of this technical paper is to identify potential impacts and recommend potential appropriate management during the construction and operation of the proposal.

Further detail on the methodology applied in this assessment is detailed in Section 3 of this technical paper.

1.5. Limitations

The following describes the limitations of this assessment:

- Due to COVID-19 restrictions access to the site was limited during the undertaking of this assessment. Site photography was undertaken by members of the project team under the guidance of the visual assessment experts.

FIGURE 1-2 OVERVIEW OF THE PROPOSAL

2. Legislative and policy context

The following review identifies key documents which provide relevant guidance for the visual assessment of the proposal. This should be read in conjunction with the planning report and its response to the planning scheme benchmarks.

2.1. Mildura Planning Scheme

The proposal is located in the Mildura local government area, between the Red Cliffs substation and the Murray River. The Mildura Planning Scheme intends to '*provide a clear and consistent framework within which decisions about the use and development of land can be made*' (VPP 01).

The transmission line corridor crosses Kings Billabong Park, which is within the Public Conservation and Resource Zone (PCRZ). A key objective of this zone is to '*protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values*' (VPP 36.03). Kings Billabong Park is also part of the Murray River Corridor Environmental Significance Overlay (ESO1, LPP 42.01). The remaining native riverine forests, woodlands and wetlands that adjoin the waterway of the Murray River, are described as '*critically important*' to maintaining the '*scenic beauty*' of the corridor (ESO1, LPP 42.01). The native riverine forests are located within Kings Billabong Park as well as the riverside section of Red Cliffs Scenic Reserve, one kilometre south-east of the proposal. The '*visual and landscape qualities*' of these environments are also recognised as being '*the basis for the demand for tourist and recreation development*' (ESO1, LPP 42.01). It further suggests that the '*visual impact of buildings in the riverine landscape can be lessened by the retention of existing native vegetation and by the planting of appropriate vegetation species*' (ESO1, LPP 42.01).

The Murray River corridor is identified as one of the state's three '*significant economic, environmental and cultural assets*' (VPP 12.03-1S). A strategy for the protection and enhancement of river corridors, waterways, lakes and wetlands is to '*ensure development is sensitively designed and sited to maintain and enhance environmental assets, significant views and landscapes along river corridors and waterways and adjacent to lakes and wetlands*' (VPP 12.03-1S). The Mildura Planning Scheme also refers to the State 'Landscapes' policy clause (VPP 12.05-2S) to '*protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments*' such the Murray River and adjacent native riverine forests.

Red Cliffs Main Pumping Station is a locally listed heritage building, located about 300 metres to the south of the proposal, adjacent to Red Cliffs substation. The Mildura Planning Scheme refers to the State 'Heritage Conservation' policy clause (VPP 15.03-1S) for the protection and enhancement of heritage items, to '*ensure an appropriate setting and context for heritage places is maintained or enhanced*'.

The south-western section of the proposal is within the Special Use Zone, associated with the existing Red Cliffs substation. The planning scheme aims to ensure that the development of facilities within this zone '*takes place in an orderly and proper manner and does not cause a loss of amenity to the surrounding neighbourhood*' (LPP 37.01).

2.2. Loddon Mallee North Regional Growth Plan

The Loddon Mallee North Regional Growth Plan identifies opportunities to encourage and accommodate growth within this region over the next 30 years. It builds upon the directions from the *Loddon Mallee Regional Strategic Plan – Northern Region* (2010). The transmission line corridor will be located the northern part of the Loddon Mallee North region. The region is valued for its environmental assets, including the Murray River and wetlands, which '*contribute to the region's identity*' (p.30).

The plan intends to protect and enhance the region's environmental assets whilst supporting the growing population with infrastructure services. These services include power, which is identified as one of the challenges for growth within the region (p.15). The development of renewable energy and associated industries within the region, including solar projects, are identified as an opportunity around Red Cliffs area (p.22).

2.3. River Red Gum Parks Management Plan

This plan outlines the management of more than 100 parks and reserves along the Murray, Ovens and Goulburn Rivers, including Kings Billabong Park. The proposed transmission line corridor crosses the Kings Billabong Park, which is identified as a protected ecological area in this plan. While there are no specific views, vistas or viewing locations have been identified within the plan, the landscapes and views within Kings Billabong Park are identified generally as 'visually significant' (s.6.3).

2.4. Mildura Older Irrigation Area Rural Strategy, 2008

While horticulture underpins the Mildura Rural City's economy, this strategy indicates that 'increasingly the MOIA is valued for the landscape amenity it provides, in particular for rural residential living as the "green oasis" and is a fundamental part of the character and identity of Mildura.' (page i)

This strategy indicates that the prevailing community position is that rural activities need to be supported to ensure the amenity of the area is maintained. (page v) The review of the MOIA concluded that 'Horticulture and the horticultural landscape is a significant element in the identity, image and liveability of the Mildura Rural City'. (page vi)

Several strategic objectives were identified, including to 'Protect the amenity of the area afforded by horticulture.' (page v).

3. Methodology

3.1. Guidance for landscape and visual impact assessment

A range of guidance is available for the assessment of landscape and visual impact. However, the industry typically refers to the following guidance:

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

The following steps were undertaken in the assessment of the landscape and visual impacts of the proposal.

3.2. Assessment of landscape impact

Landscape is defined as … 'Landscape is an all-encompassing term that refers to areas of the earth's surface at various scales. It includes those landscapes that are: urban, peri-urban, rural, and natural; combining bio-physical elements with the cultural overlay of human use and values.' (Australian Institute of Landscape Architects, 2018)

The landscape assessment begins with the identification of landscape character areas. An assessment of landscape impact was then carried out by identifying the sensitivity of each landscape character area, and the likely magnitude of change expected as a result of the proposal. These factors were combined to make an overall assessment of landscape impact.

3.2.1. Existing landscape character

The landscape assessment begins with a description of the existing landscape character of the landscape and visual study area. Character is the … 'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, and often conveys a distinctive 'sense of place'. This term does not imply a level of value or importance' (Australian Institute of Landscape Architects, 2018). The existing landscape character of this area reflects the qualities of the built, natural and cultural environment, including geology, topography, vegetation, waterways, built form, patterns and types of land use.

3.2.2. Landscape sensitivity

Landscape sensitivity refers to the value placed on a landscape and its susceptibility to change. The sensitivity of a landscape may reflect the frequency and volume of users but it may also reflect valued characteristics such as rarity, tranquillity, scenic amenity and its contribution to sense of place. The value of landscapes can be described in Federal, State and local government masterplans and planning documents and protected by legislation. These protections reflect the importance of landscape resources to the local, regional and state-wide community.

Landscape sensitivity in this assessment is therefore considered in the broadest possible context, from those landscapes of national importance through to those considered to be landscapes of importance locally.

Table 3-1 lists the landscape sensitivity levels that applies to this assessment.

TABLE 3-1: LANDSCAPE SENSITIVITY LEVELS

Landscape sensitivity	Description
National	- Landscape feature or place protected under national legislation or international policy e.g. the Red Top visitor areas of the World Heritage Listed Mungo National Park, The Great Ocean Walk at the Twelve Apostles within the Port Campbell National Park. - These landscapes are generally unique and uncommon nationally.
State	- Landscape feature or place that is heavily used and/or is iconic to the State, e.g. Federation Square, Birrarung Marr and the Royal Botanic Gardens Melbourne - These landscapes are generally unique to or uncommon within the state.
Regional	- Landscape feature or place that is heavily used and valued by residents of a major portion of a city or a non-metropolitan region and / or - Places with regionally important scenic value or to landscape features e.g. Red Cliffs Scenic Reserve, sections of the Murray River. - These places are generally unique or uncommon within the region.
Local	- Landscape feature valued and experienced by concentrations of residents and/or local recreational users and / or - Places of local scenic value or local landscape features. - These places are likely to be somewhat common within the landscape.
Neighbourhood	- Places without any particular scenic values or local landscape features - These places are likely to be common within the landscape.

3.2.3. Magnitude of change to the landscape

The changes to the landscape that would occur as a result of the proposal are assigned a magnitude of change level. This considers direct impacts on the landscape such as the removal of trees and landform change, as well as indirect impacts, such as changes to the activities within of a nature reserve recreation area. The magnitude of change can result in adverse or beneficial effects.

Table 3-2 lists the magnitude of change levels that have been used in this assessment.

TABLE 3-2: LANDSCAPE MAGNITUDE OF CHANGE LEVELS

Magnitude of change	Description
Very high	- The landscape is altered such that the proposal dominates and / or transforms its character, amenity and / or function.
High	- The proposal substantially changes and / or is not compatible with the character, amenity, and function of the landscape. - This would result in an extensive and / or severe change in landscape values.
Moderate	- The proposal somewhat changes and / or is not compatible with the character, amenity, and function of the landscape. - This would result in a considerable and / or unsympathetic change in landscape values.
Low	- The proposal changes are minor and / or are compatible with the character, amenity, and function of the landscape. - It would result in a slight change in landscape values.
Negligible	- The proposal would not change the character, amenity and/ or function of the landscape. - If there is a change, it would not be perceived as altering the landscape values.

3.2.4. Assigning landscape impact levels

An assessment of landscape impact has been made by combining the landscape sensitivity and magnitude of change levels to assign an overall level of impact (refer to Table 3-3).

TABLE 3-3: LANDSCAPE IMPACT LEVELS

	Sensitivity				
Magnitude of change	National	State	Regional	Local	Neighbourhood
Very high	Very high	Very high	High	High	Moderate
High	Very high	High	High	Moderate	Low
Moderate	High	High	Moderate	Low	Low
Low	Moderate	Moderate	Low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

3.3. Assessment of visual impact

The assessment of visual impact uses a representative viewpoint assessment approach. Representative viewpoints have been selected from the potential visual catchment of the proposal. Each view has then been assessed by identifying the magnitude of change level created by the proposal, and the sensitivity of the viewer. Combined, these characteristics of the view are then used to assign a level of potential visual impact. This methodology is explained more fully in the following paragraphs.

3.3.1. Existing visual conditions

Visual catchment and potential visibility of the proposal

A map has been prepared to illustrate the potential visual catchment of the proposal and extent of visibility from areas within this catchment. This visibility analysis uses a 3D model which shows terrain, vegetation and buildings, with points on the top of each proposed transmission line structure, to identify the areas from which views to the proposal may be seen. The analysis shows areas where a greater number of transmission line structures are visible as a darker colour.

The 3D model uses a 1 metre Digital Surface Model (DSM) derived from the Mildura LiDAR LAS Point Cloud, from the NSW Spatial Services, Department of Finance, Services and Innovation 2013). The model is a representation based on data points and is the first step in the analysis process. The filtering effect of vegetation, mitigating effect of distance and other environmental conditions will be verified on site.

3.3.2. Representative viewpoint assessment

Site photographs were taken in June and October of 2020. These inspections verified the results of a preliminary viewshed analysis.

Photographs representing the range of views of the proposal have been selected. They include views from areas where the greatest number of viewers are likely to congregate, such as lookouts, major roads and scenic routes, as well as locations in sensitive recreational and natural areas. They also include views from local streets and in residential areas to represent the views from these areas. Views from the air and views from the Murray River have been addressed generally for the proposal study area.

Photomontages have been prepared for some viewpoints to support the assessment of impact. These views illustrate locations where the proposal would be seen from higher sensitivity locations and to show a typical view within each landscape character area.

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.

To ensure the impacts are attributed fairly, the sensitivity of each viewpoint is considered in the broadest context of possible views, including those of national importance through to those considered to have a neighbourhood importance. The following terminology has been used to describe the level of visual sensitivity, see Table 3-4.

TABLE 3-4: VISUAL SENSITIVITY TABLE

Visual sensitivity	Description
National	- Heavily experienced view to a national icon, e.g. view from the Red Top Lookout at the World Heritage Listed Mungo National Park, or views to the Twelve Apostles from a viewing platform within the Port Campbell National Park and / or - Views to areas with a scenic value of national importance or to landscape features of the state, and / or - Views from World Heritage Listed Places. - These views are generally unique and uncommon nationally.
State	- Heavily experienced view to a feature or landscape that is iconic to the state, e.g. views to and from the Royal Botanic Gardens to Melbourne's central business district and / or - Views to areas with a scenic value recognised by the state. - These views are generally unique or uncommon within the state.
Regional	- Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space e.g. view from the Red Cliffs Scenic Reserve lookout, and / or - Views to areas of regionally important scenic value or to landscape features of the region. - These views are generally unique or uncommon within the region.
Local	- High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users, and / or - Views to areas of local scenic value or to local landscape features. - These views are somewhat common within the landscape.
Neighbourhood	- Views where visual amenity is not particularly important to the wider community, such as lower quality views briefly glimpsed from roads. - These views are likely to be common within the landscape.

Magnitude of change

The magnitude of change refers to the change to the landscape that would occur as a result of proposal from a given viewpoint. This includes what has changed, and how it has changed. Visual modification 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 landscape. Visual modification can result in an improvement or reduction in visual amenity.

A high magnitude of change will result if the proposal contrasts strongly with the existing landscape. Whereas a low degree of visual modification 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 proposal may be noticeable but does not markedly contrast with the existing modified landscape.

Table 3-5 lists the terminology used to describe the level of visual modification.

TABLE 3-5: MAGNITUDE OF CHANGE

Magnitude of change	Description
Very high	- The view is altered such that the proposal visually dominates and transforms the character of the view. - It would result in a substantial change in the amenity of the view.
High	- The proposal is visually prominent, and / or contrasts with the character of the view. - It would result in a considerable change in the amenity of the view.
Moderate	- The proposal is somewhat prominent and / or is not compatible with the character of the view. - It would result in a noticeable change in the amenity of the view.
Low	- The proposal is not visually prominent and / or is visually compatible with the character of the view. - It would result in a slight change in the amenity of the view.
Negligible	- The proposal is not visible, is not visually prominent in the view and / or is compatible with the character of the view. - It would result in no perceived change in the amenity of the view.

There are some general principles regarding the relationship between the proposal and the landscape which determine the magnitude of change level. These principles, or assumptions, relate to how well a transmission line can be absorbed into the landscape and what is considered to be more or less visually harmonious. These principles will be applied generally to the viewpoint assessment, and 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 proposal into a view i.e. lattice transmission line structures can be seen through and more visually light weight in some settings;
- **Distance**, the greater the distance, the less prominent the transmission line structures are likely to be;
- **Landform**, the location of the transmission line structures in relation to the surrounding landform i.e. landform may intervene and screen views, or may allow greater visibility if the proposal 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; and
- **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 proposal elements.

These principles have been applied generally to the viewpoint assessment.

3.3.3. Assigning visual impact levels

An assessment of visual impact has been made by combining the visual sensitivity and magnitude of change levels for each representative viewpoint and assigning an impact level (refer to Table 3-6).

TABLE 3-6: VISUAL IMPACT LEVELS

	Sensitivity				
Magnitude of change	National	State	Regional	Local	Neighbourhood
Very high	Very high	Very high	High	High	Moderate
High	Very high	High	High	Moderate	Low
Moderate	High	High	Moderate	Low	Low
Low	Moderate	Moderate	Low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

3.3.4. Photomontages

Two photomontages have been prepared to illustrate the expected changes to views as a result of the proposal. Photomontages are created using a combination of 3D modelling and photo editing techniques.

The process used to prepare these images was as follows:

- GPS coordinates and details of the camera was recorded;
- A terrain model was prepared using contours with five metre intervals;
- The camera was positioned in the model using the photograph GPS data for each image;
- A minimum of three points were identified in each view, from the terrain model, and used to align the view; and
- The transmission line structures, wires and associated infrastructure were modelled in 3D and materials assigned to the model.

These modelled views were then edited in photoshop to insert the model into the photograph.

For this assessment, the proposed transmission line corridor and approximate structure locations (four locations in total) have been used. The final locations would be confirmed during detailed design, however, the assessment presents a representative assessment of impacts. Due to scattered nature of the recreational receptors in the area, the assessment should remain appropriate to any minor changes to the structure locations during detailed design.

The photomontages used in this assessment represent the operational view to the proposal. Photomontages of construction activity have not been prepared as these are temporary activities which would change throughout the construction process.

The depiction of the proposal within the photomontages has assumed the maximum proposed height of 46 metres, with four mono-pole type structure locations spaced about 400 metres apart. At two of these locations, (being the northern pole location near the Murray River and southern pole location near the existing Red Cliffs substation) two poles would be installed. At the remaining locations, only single poles would be installed

The viewpoints used to create these photomontages were chosen to represent views from areas with the greatest visual sensitivity, where the greatest number of viewers would be located, and where the proposal would be most visible.

3.4. Assessment of night-time visual impact

An assessment of the potential visual impacts of the proposal at night has been undertaken for the area.

The assessment of night-time impact has been carried out with a similar methodology to the daytime assessment. However, the assessment also draws upon the guidance contained within AS4282 *Control of the obtrusive effects of outdoor lighting* (2019).

AS4282 identifies four main potential effects of lighting, which are, the effects on residents, transport system users, transport signalling systems and astronomical observations. Of relevance to this assessment is the effects of lighting on the visual amenity of residents and local road users.

AS4282 identifies environmental zones which are useful for categorising night-time landscape settings. The following assessment will use these environmental zones to describe the existing night-time visual condition and assign a sensitivity to these settings.

3.4.1. Night-time visual sensitivity

The environmental zone (defined in AS4282) which best describes the existing night-time visual condition of the proposal has been selected. These zones are typical night-time settings and reflect the predominant light level of each landscape character area. Each environmental zone is assigned a level of sensitivity as described in Table 3-7.

TABLE 3-7: ENVIRONMENTAL ZONE SENSITIVITY – NIGHT-TIME

	Environmental Zones (AS4282:2019)	
Sensitivity level	**Description**	**Examples**
Very high	A0: Intrinsically dark	UNESCO Starlight Reserve IDA Dark Sky Parks Major optical observatories No road lighting – unless specifically required by the road controlling authority
High	A1: Dark	Relatively uninhabited rural areas No road lighting – unless specifically required by the road controlling authority
Moderate	A2: Low district brightness	Sparsely inhabited rural and semi-rural areas
Low	A3: Medium district brightness	Suburban areas in towns and cities
Negligible	A4: High district brightness areas	Town and city centres and other commercial areas Residential areas abutting commercial areas

3.4.2. Night-time magnitude of change

Following the sensitivity assessment, the magnitude of change that would be expected within each landscape character area at night is then identified. These changes are described, as relevant, in terms of:

- Sky glow – which is the brightening of the night sky
- Glare – condition of vision in which there is discomfort or a reduction in ability to see
- Light spill – light emitted by a lighting installation that falls outside of the design area.

Table 3-8 lists the categories used to describe the visual magnitude of change at night.

TABLE 3-8: VISUAL MAGNITUDE OF CHANGE LEVELS – NIGHT-TIME

Magnitude of change	Description
Very high	- Substantial change to the level of skyglow, glare or light spill expected, and / or - The lighting of the proposal would transform the character of the surrounding setting at night, and / or - The effect of lighting would be experienced over an extensive area.
High	- Considerable change to the level of skyglow, glare or light spill and / or - The lighting of the proposal would noticeably contrast with the surrounding landscape at night and / or - The effect of lighting would be experienced across a large portion of the landscape.
Moderate	- Alteration to the level of skyglow, glare or light spill would be expected, and / or - The lighting of the proposal would contrast somewhat with the surrounding landscape at night, and / or - The effect of lighting would be experienced across a moderate portion of the landscape.
Low	- Alteration to the level of skyglow, glare or light spill would be expected, and / or - The lighting of the proposal would not contrast substantially with the surrounding landscape at night, and or - The effect of lighting would be experienced across a small portion of the landscape.
Negligible	- Either the level of skyglow, glare and light spill is unchanged or - if it is altered, the change is generally unlikely to be perceived by viewers or - compatible with the existing or intended future use of the area.

3.4.3. Night time visual impact levels

An assessment of night-time visual impact has been made by combining the visual sensitivity of the environmental zone with the night-time visual magnitude of change for each area generally and assigning an impact level (refer to Table 3-9).

TABLE 3-9: VISUAL IMPACT LEVELS – NIGHT TIME

	Sensitivity (AS4282:2019 Environmental Zone)				
Magnitude of change	Very high (A0)	High (A1)	Moderate (A2)	Low (A3)	Negligible (A4)
Very high	Very high	Very high	High	High	Moderate
High	Very high	High	High	Moderate	Low
Moderate	High	High	Moderate	Low	Negligible
Low	Moderate	Moderate	Low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

3.5. Mitigation

Methods for reducing the landscape and visual impact of the proposal have been considered and specific mitigation approaches recommended. These measures are identified for the construction and operation of the proposal.

4. Landscape assessment

The following section includes a description of the existing conditions and sensitivity of this landscape character area and describes the magnitude of change expected as a result of the proposal and assigns an impact level (refer Figure 4-2).

4.1. Existing landscape character

The landscape character of the proposal study area is strongly associated with the Murray River floodplain. The River meanders through this area, carving cliffs and creating shallow flood plains. The southern side of the river corridor is defined by distinctive red cliffs, that rise high from the river edge (refer to Figure 4-1).

Further to the north and northeast of the proposal, the landform broadens out and slopes more gently towards the Murray River, including expansive areas of low wetlands. Some areas along this stretch of the river are conservation areas, including Kings Billabong Park, and Red Cliffs Scenic Reserve. These areas are '*strongly valued for the opportunities they provide for recreational activities such as camping and water-based activities such as fishing*' (Parks Victoria, 2018, cl.1.5). Kings Billabong Park is considered to contain '*visually significant*' landscape and geological features (Parks Victoria, 2018, cl.6.3).

Kings Billabong Park, located on lower lying land, comprises wetlands and includes a several small access tracks, a boat ramp and picnic area. The Red Cliffs Scenic Reserve, to the southeast of the proposal, includes the distinctive red cliffs and recreational facilities including trails, boardwalks and viewing areas. Both areas offer views to and across the Murray River, to NSW, where there is further cliffs and riverine vegetation, as well as rural landscapes.

To the north and south of the proposal, the landscape is characterised by large-scale power infrastructure. This includes Red Cliffs substation and the 220 kilovolt transmission lines which extend between Buronga and Red Cliffs, crossing the Murray River north-east of the substation. There are also transmission lines that run south, alongside the river through Red Cliffs Scenic Reserve. The presence of transmission lines strongly influences the character of this area.

A small cluster of houses on suburban size lots is located along Woomera Avenue, beside the substation. Further to the south, there are some small acreage properties and rural lifestyle blocks overlooking the river. Other infrastructure in the area include a reservoir and a number of rural structures including sheds, workshops, packing and processing facilities, supporting the surrounding agricultural uses.

West of the Red Cliffs substation, the landscape is relatively flat and then gently undulating to the towards the township of Red Cliffs. This landscape has been extensively cleared and modified for irrigated arable farming purposes since the early 1920s, when the Red Cliffs Main Pumping Station was built (c.1920-1923) to draw water from the Murray River up over the cliffs and into extensive irrigation channels. Although the pumping station is now disused, it is a local landmark in this area, reflected in its local heritage listing in *Mildura Planning Scheme*. This rural landscape includes a mix of cereal crops, viticulture, and horticulture such as citrus, and wine and table grapes. Beyond the irrigated area, broad-acre dryland crops are grown (refer to Figure 4-3 and Figure 4-1.

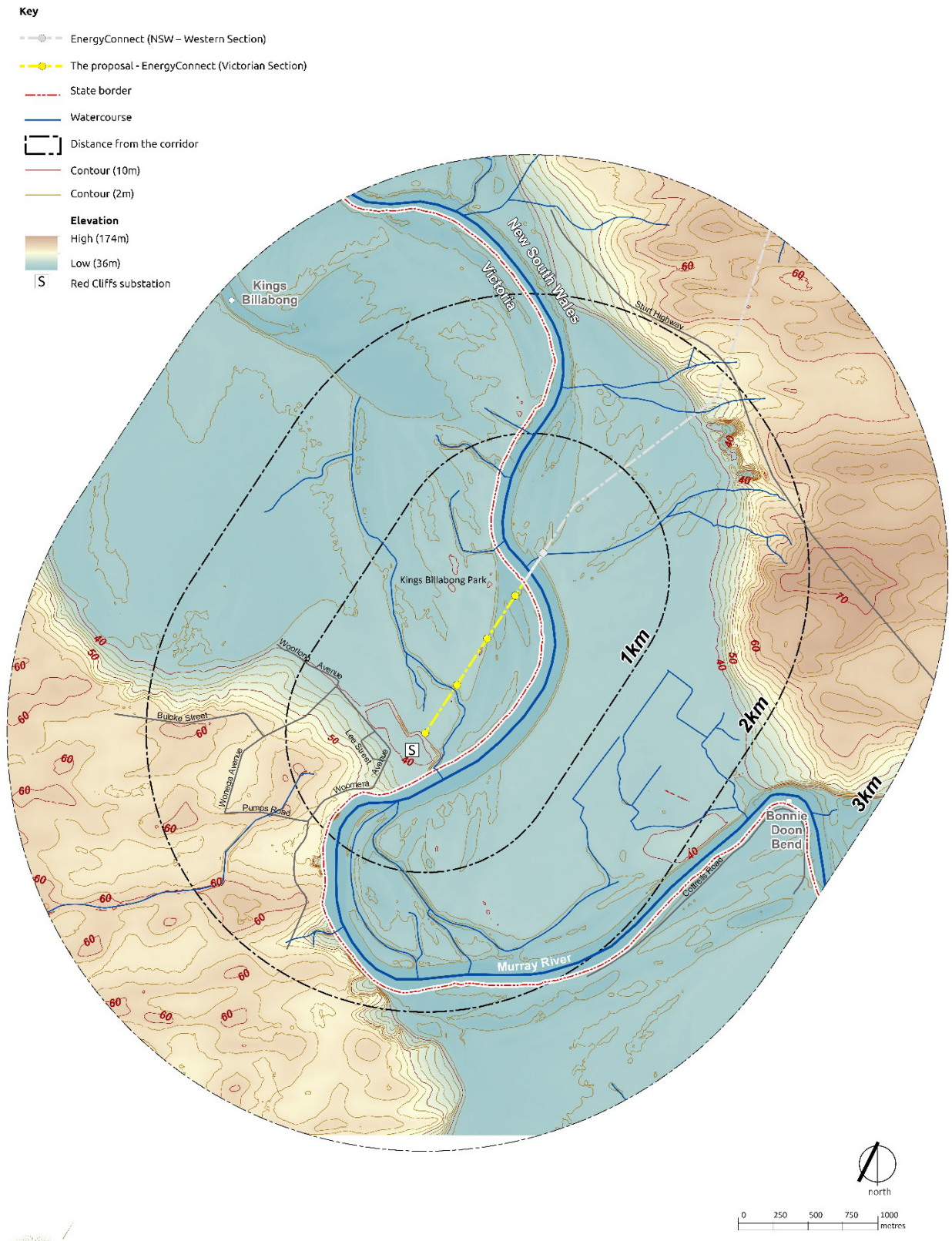

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FIGURE 4-2 TOPOGRAPHY

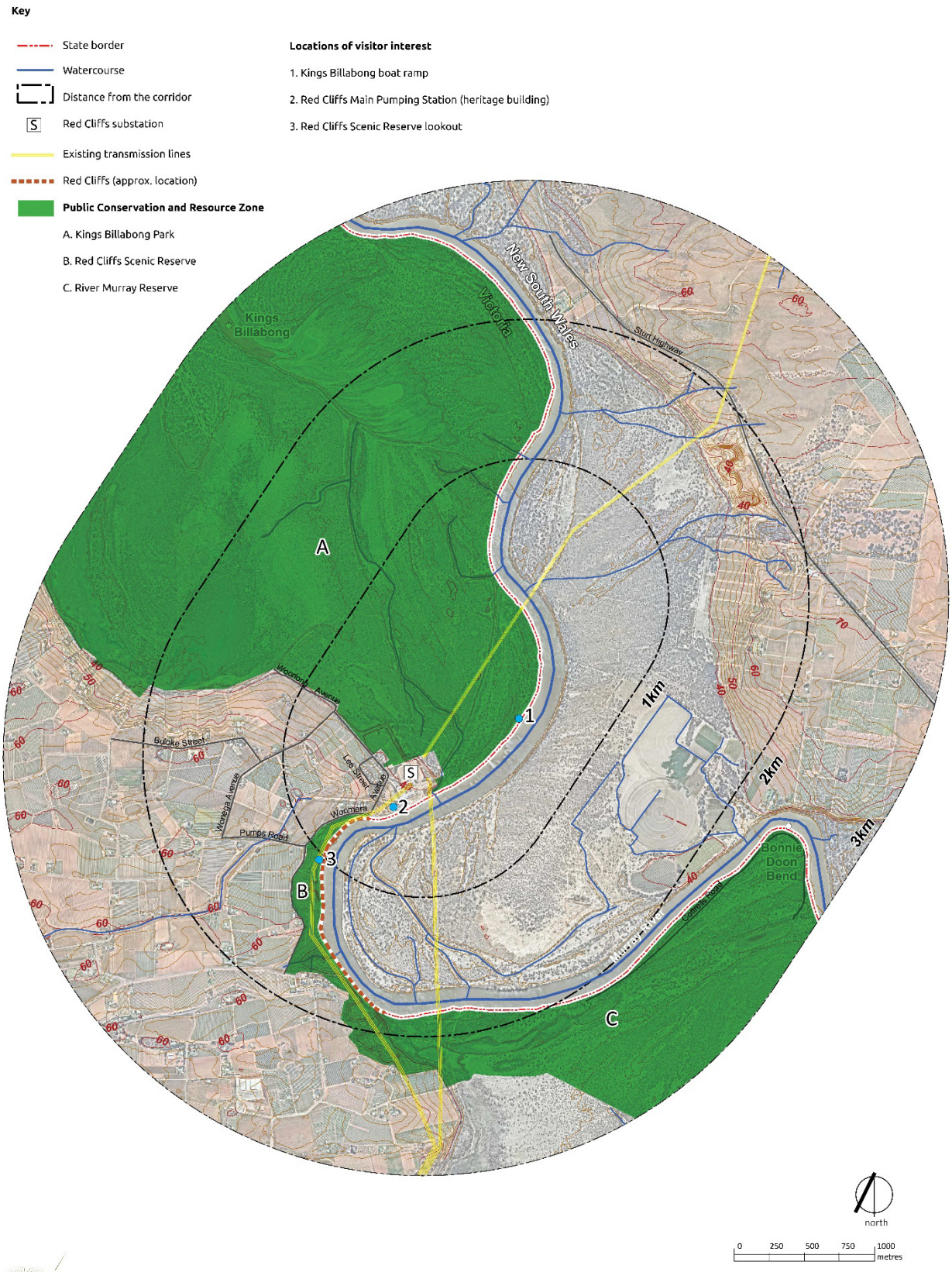

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FIGURE 4-3 LANDSCAPE FEATURES

4.2. Landscape sensitivity

This landscape includes riverfront areas of the Murray River, including Kings Billabong Park and Red Cliffs Scenic Reserve (refer to Figure 4-4). These are recreational and conservation areas with, identified as having scenic and landscape values in the *Mildura Planning Scheme*. This landscape would be used by both locals and visitors to the region using the reserves and river for recreation. Overall, due to the level of facilities provided in the Red Cliffs Scenic Reserve, it would be of **regional landscape sensitivity**, whereas the remaining areas are of **local landscape sensitivity**.

4.3. Landscape impact during construction

Construction access tracks would be established, and some areas prepared for storage and laydown areas in locations at each transmission line structure. Vegetation within the construction footprint would be impacted with some vegetation completely removed and some trimmed to lower heights to form a corridor. Full vegetation removal is expected at each transmission line structure worksite and along access tracks.

There would be some minor localised landform modification required at each transmission structure, particularly in areas where the landform is more undulating near the Murray River. Apart from the vegetation removal, the proposal would not directly impact on any important landscape features. While there would not be any direct impact on the boat ramp and picnic area, there would be some minor impact on recreational activities where access to these areas is temporarily diverted.

Overall, there would be a low magnitude of change to this landscape, which is of local landscape sensitivity, and a **low landscape impact** during construction.

4.4. Landscape impact during operation

The proposal would replace the existing transmission line structures with new structures, and also create a larger corridor. The conservation and recreational uses would continue around and under the transmission lines and within the transmission line corridor. Areas impacted by construction, outside the corridor, would be reinstated and revegetated as appropriate.

The proposal would consist of taller steel pole style transmission line structures, regularly spaced across this landscape, replacing the existing steel lattice 220 kilovolt transmission structures. This would increase the scale of power infrastructure in the immediate vicinity of the transmission line corridor, but not substantially alter the character of the wider landscape which has a strong presence of transmission line infrastructure. Although the transmission line corridor would be wider initially, vegetation clearing would only occur where the transmission structures are installed and vegetation removal within the remainder of the corridor would maintain trees and shrubs to a height of two metres tall. The proposal would utilise existing maintenance access tracks, although some tracks would be widened to eight metres, requiring vegetation removal.

Overall, there would be a low magnitude of change to this landscape which is of local landscape sensitivity, and a **low landscape impact** during operation.

There would be no direct impact upon the regionally sensitive landscapes of the Red Cliffs Scenic Reserve, and therefore a **negligible landscape impact** during operation.

FIGURE 4.4 LANDSCAPE CHARACTER IMAGES

4.5. Summary of landscape impacts

In summary, the proposal study area includes areas of local and regional landscape sensitivity, however, there would be relatively low magnitude of change on the landscape during construction and operation of the proposal. This is due to several factors including the relatively small area of direct impact on vegetation, the flat landscape along the transmission line corridor requiring minimal landform changes, the presence of existing transmission line infrastructure within this area, and the conservation and recreational uses that would continue (refer to Table 4-1).

TABLE 4-1: SUMMARY OF LANDSCAPE IMPACTS

		Construction		Operation	
Landscape character area	Landscape sensitivity	Magnitude of change	Landscape impact	Magnitude of change	Landscape impact
Murray River plain landscape	Local	Low	Low	Low	Low
Red Cliffs Scenic Reserve	Regional	Negligible	Negligible	Negligible	Negligible

5. Visual impact assessment

5.1. Visual catchment of the proposal

Figure 5-1 shows the potential visual catchment of the proposal. This map highlights areas where a greater length of the proposal would be seen with an increasingly darker colour. This visual catchment diagram shows that the proposal would be visible from a broad visual catchment due to the height of the structures.

The visual catchment of the proposal is mostly determined by landform and vegetation cover. Therefore, due to the height of the structures, the visibility of the upper portion of the structures extends across a broad area surrounding the transmission line corridor.

Generally, there is the potential for a higher level of visibility of the proposal from areas along the river, including where the landform rises steeply along the cliffs, and with less visibility to the east and west, where the landform flattens out and is elevated above the river.

Within this area there would be close range views to the proposal, where existing access tracks cross the transmission line corridor, however, the vegetation surrounding the proposal would limit views from recreational areas along the flatter areas of the river plain. There would be close and middle range views to the proposal from the Murray River, where the transmission line crosses the river into NSW.

There would be views from the paths and elevated viewing areas within the Red Cliffs Scenic Reserve, where the landform rises and views are possible across the broader landscape.

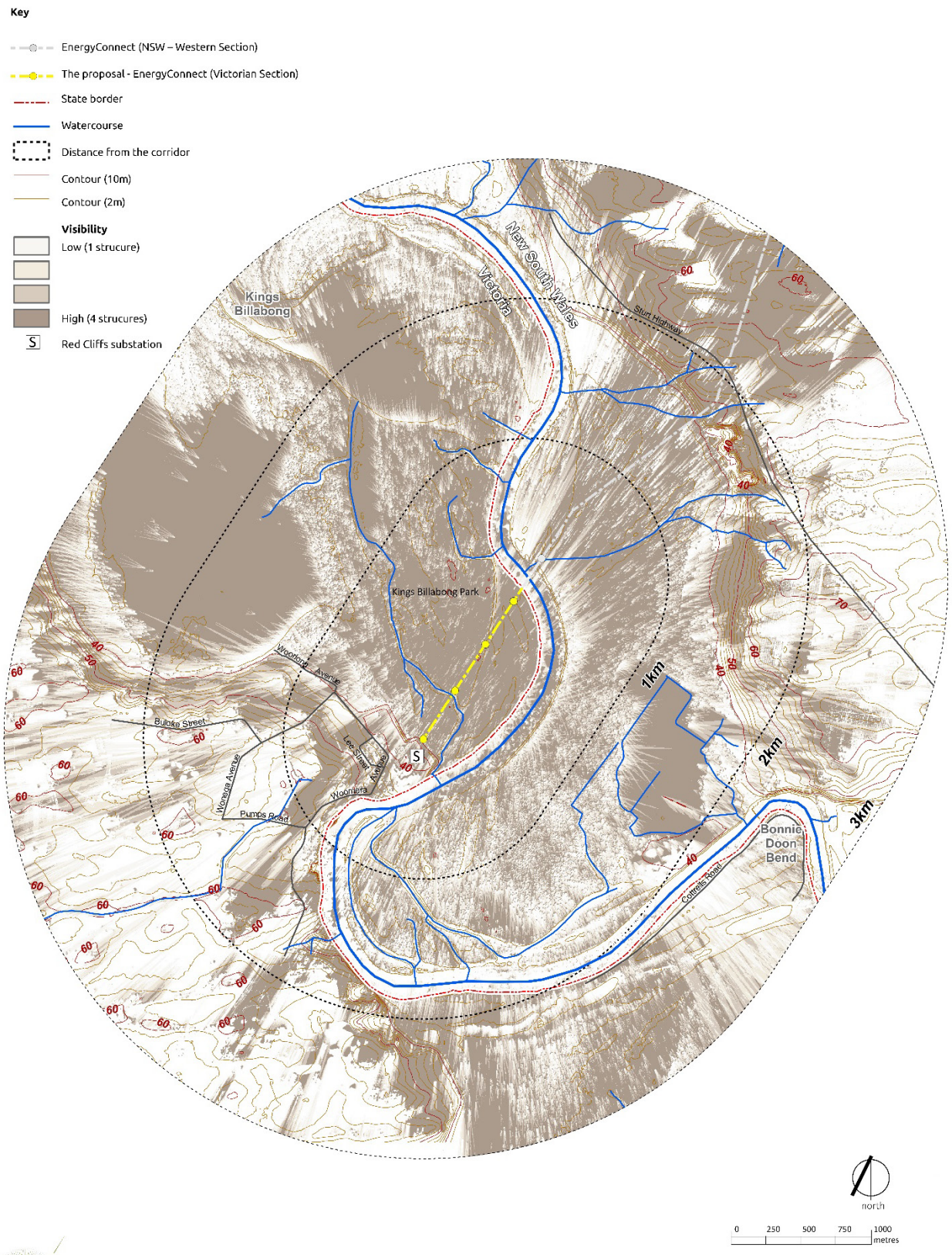

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FIGURE 5-1 VISIBILITY ANALYSIS

5.1.1. Visual sensitivity of the proposal study area

The proposal study area includes several locally important scenic and environmental reserves that are used for recreation. The location of a view within a designated lookout, open space area or reserve 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.

The following receptors have been identified as likely to have an elevated visual sensitivity:

- Red Cliffs Scenic Reserve, including views from the lookout and boardwalk. The lookout provides elevated views over the Murray River and to the distinctive cliffs. The riverside part of this reserve is identified as environmentally significant (ESO1) in the *Mildura Planning Scheme*. The '*visual and landscape qualities'* of this environment are also recognised as being '*the basis for the demand for tourist and recreation development'* (Schedule 1 to ESO1).
- Kings Billabong Park, including the riverside boat ramp and picnic areas, is identified as environmentally significant (ESO1) in the *Mildura Planning Scheme* as well as a protected ecological area in the *Red River Gums Parks Management Plan*. While there are no specific views, vistas or viewing locations identified within this area, the landscapes and views within Kings Billabong Park are identified generally as '*visually significant'* (s.6.3).
- Murray River, including from recreational and house boats. The Murray River is described as a '*key attraction for visitors to the area*' in the *River Red Gum Parks Management Plan*. The river corridor is also identified as one of the state's three '*significant economic, environmental and cultural assets'* (VPP 12.03-1S), including native riverine forests, woodlands and wetlands that contribute to the '*scenic beauty*' of the corridor (ESO1, LPP 42.01).

5.2. Assessment of daytime visual impacts

5.2.1. Selection of representative viewpoints

The following views represent the range of views to the proposal and will be assessed in this technical paper:

1. View north-west from Red Cliffs Scenic Reserve lookout
2. View north-west from Red Cliffs Scenic Reserve
3. View east from Woomera Avenue
4. View south-west from the boat ramp access track, Kings Billabong Park.

The location of these viewpoints is shown in Figure 5-2.

In addition, views from the Murray River, and views from the air would be considered generally as they relate to the proposal study area.

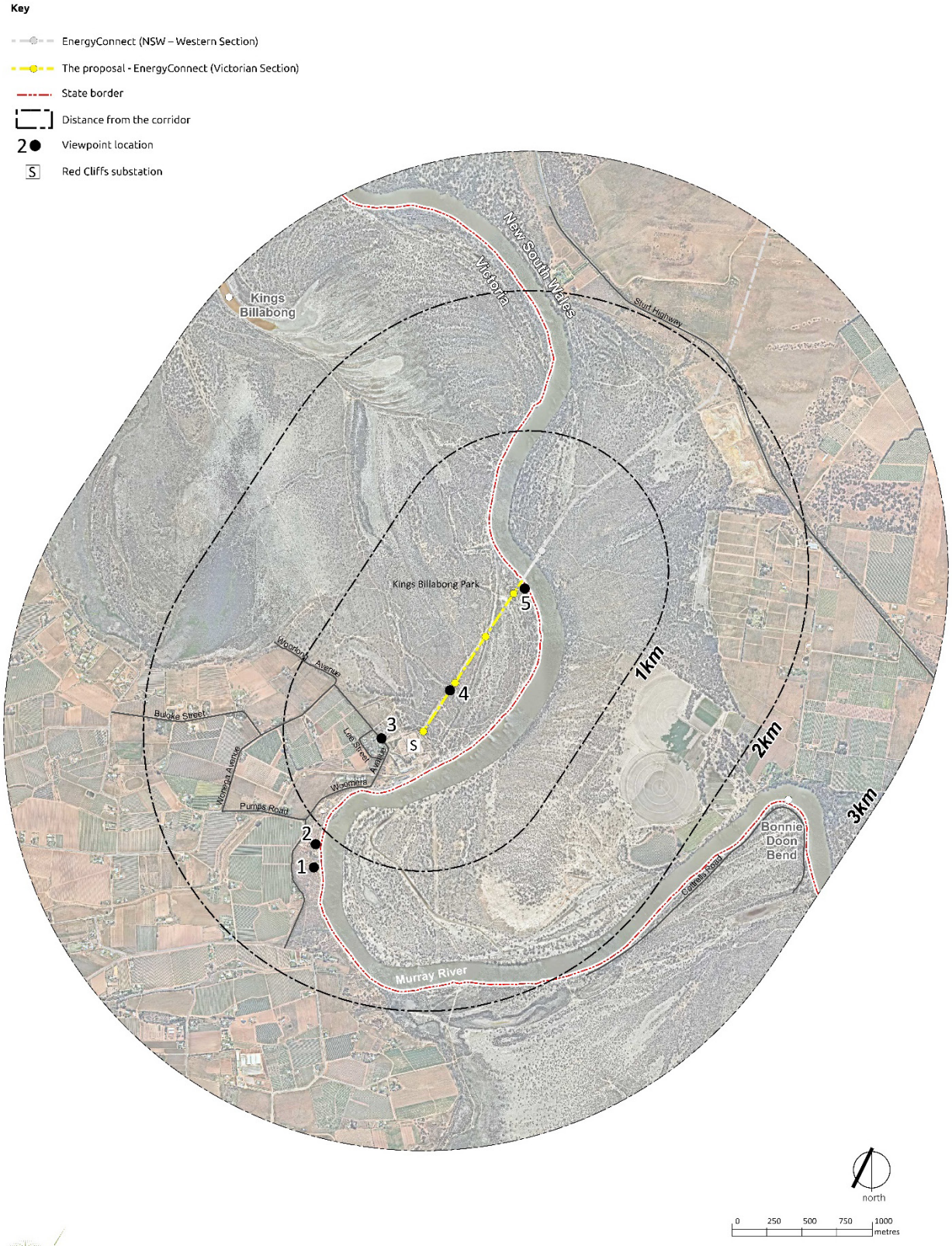

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FIGURE 5-2 VIEWPOINT LOCATION PLAN

5.2.2. Assessment of representative viewpoints

The following section includes an assessment of each representative view and identifies the daytime visual impacts.

Viewpoint 1: View north-west from Red Cliffs Scenic Reserve lookout

FIGURE 5-3: VIEW NORTH-WEST FROM RED CLIFFS SCENIC RESERVE LOOKOUT

FIGURE 5-4: PANORAMIC VIEW NORTH-WEST AND NORTH FROM RED CLIFFS SCENIC RESERVE LOOKOUT

FIGURE 5-5: PANORAMIC VIEW NORTH AND NORTH-EAST FROM RED CLIFFS SCENIC RESERVE LOOKOUT

Location: 34°17'52.20"S, 142°13'54.82"E

Existing conditions: This view from Red Cliffs Scenic Reserve lookout shows a bend in the Murray River, and the distinctive cliffs along the western bank of the river. The shallow banks and flat river plains on the north-eastern side of the river (right of view) are also visible with scattered vegetation. The existing steel lattice structures and wires of the 220 kilovolt transmission lines can be seen extending west towards the Red Cliffs substation, through Red Cliffs Scenic Reserve, and then north through the Kings Billabong Park, crossing the Murray River, and continuing north towards the Sturt Highway. The dense vegetation within the Kings Billabong Park obstructs the view to the Red Cliffs substation and lower sections of the transmission structures. The vegetation along the river also screens views to the fields of arable farmland to the north-east and south-west.

Sensitivity: While the Red Cliffs Scenic Reserve is identified as having higher scenic values in the *Mildura Planning Scheme* the quality of this particular aspect of the view is reduced by the existing infrastructure which detracts from the quality of this view. Overall, this view is of **regional visual sensitivity**.

Visual impact during construction: The proposal would be located about one kilometre to the north-west of this location. Several structures would be constructed in the background of this view. The upper portions of the construction activities and equipment installing the steel monopole structures and stringing of the wires and conductors would be visible in the background, rising above the adjacent vegetation. The removal of vegetation within the construction footprint may be seen, however, the ground level construction works and equipment would be screened by intervening vegetation which would remain in areas to the east and west of the proposal.

The works would be seen in the background of this view and filtered by vegetation. Overall, there would be a low magnitude of change and a **low visual impact** in views from this location.

FIGURE 5-6: VIEW NORTH-WEST FROM RED CLIFFS SCENIC RESERVE LOOKOUT, PHOTOMONTAGE

Visual impact during operation: The proposal would extend in a north-easterly direction from the Red Cliffs substation, located to the east of the existing Buronga to Red Cliffs transmission line (closer to the viewer), which would be removed. The proposed transmission line structures would be new steel monopole transmission line structures, which would be partially visible in the middle and background of this view. These structures would be larger in height than the existing structures and would be seen rising above the existing vegetation.

Overall, while these transmission line structures would rise prominently above the tree line, they would not dominate or change the prevailing character of this view. There would be a low magnitude of change as a result of the proposal, and a **low visual impact**.

Viewpoint 2: View north-west from Red Cliffs Scenic Reserve

FIGURE 5-7: VIEW NORTH-WEST FROM RED CLIFFS SCENIC RESERVE

Location: 34°17'59.48"S, 142°13'53.48"E

Existing conditions: The view is from a trail in Red Cliffs Scenic Reserve to the southern bank of the river. This view includes parts of the distinctive red cliffs, which characterise this area of the river, in the fore and middle ground. The vegetation along the riverbanks and reserve filter views to the river, and the Red Cliffs substation and surrounding built structures, which are located about one kilometre to the north-west (centre and out of view). The existing steel lattice structures and wires of the 220 kilovolt transmission lines extending from the substation through Red Cliffs Scenic Reserve, is visible in the middle ground. There are also several other smaller distribution poles and wires located in the background of this view.

Sensitivity: While the Red Cliffs Scenic Reserve is identified as having higher scenic values in the *Mildura Planning Scheme* the quality of this particular view is reduced by the existing infrastructure which detracts from the quality of this view. Overall, this view is of **local visual sensitivity**.

Visual impact during construction: The proposal would extend in a north-easterly direction from existing Red Cliffs substation. The proposal would be constructed adjacent to the existing Buronga to Red Cliffs transmission line structures (OX1 Line) and would be largely out of view due to the intervening vegetation and distance of the proposal from this location.

Any construction activity that would be seen, would be glimpsed above the intervening vegetation and seen in the background of the view. Overall, any works would be absorbed into this view, which already contains large scale transmission line infrastructure, so that there would be a negligible magnitude of change and a **negligible visual impact**.

Visual impact during operation: This view would be largely unchanged as the existing steel lattice transmission structures and lines extending north-east of Red Cliffs substation, which would be removed and replaced with new monopole transmission line structures, would be glimpsed in the background of this view. While the proposed transmission line structures would taller than the existing structures, they would be seen amongst and rising above the existing vegetation. They would have a simpler form and would recede into the background of this view. The vegetation in the foreground of this view would be retained and there would not be a clear view to the cleared transmission line corridor. Overall, there would be a negligible magnitude of change and a **negligible visual impact**.

Viewpoint 3: View east from Woomera Avenue

FIGURE 5-8: VIEW EAST FROM WOOMERA AVENUE

Location: 34°17'30.17"S, 142°14'12.42"E

Existing conditions: The Red Cliffs substation is visible in the middle ground of this view. The substation is enclosed by fencing, set back from the road and partially screened by trees and shrubs within and surrounding the substation site. The fence line in the centre of view marks the boundary between substation site and adjacent Kings Billabong Park, a protected ecological area used for conservation and recreation. The view contains a mixture of steel lattice and monopole transmission structures and wires, including the 220 kilovolt Buronga to Red Cliffs line (OX2 Line), which extends north through the Kings Billabong Park.

Sensitivity: Woomera Avenue is a surfaced road providing access to the substation, adjacent pumping station, the Red Cliffs irrigation district including several residences. This is a locally common view which would be experienced from vehicles moving at low speed through this residential area, by a low number of receivers. It also represents views from nearby houses along Woomera Avenue. Overall, this view is of **neighbourhood visual sensitivity**.

Visual impact during construction: There would be construction vehicles accessing the proposal from Woomera Avenue seen in the foreground of this view. Works to clear and trim vegetation and to install the southern-most transmission line structure would be seen in the middle ground of the view, beyond and partly filtered by the existing substation. The new monopole structure would be installed to the east (right of view) of the existing lattice structure, which would be removed. Works to erect the transmission line structure and string the wires would be seen and include the use of large machinery such as excavators and graders, cranes, and ground pulled draw wire.

This construction activity would be seen in close proximity to a residential locality. Overall, there would be a low magnitude of change and a **negligible visual impact** in views from this location.

Visual impact during operation: The existing steel lattice transmission structures and lines extending north-east from the substation would have been removed and replaced with monopole structures, visible in the middle to background of this view. The proposal transmission line corridor would be located to the east (right of view) of the existing Buronga to Red Cliffs transmission line, which would have been removed, and would be partly screened by the existing substation. The new monopole structures would be taller than the existing lattice structures, and apart from some minor vegetation clearing and trimming along the corridor and at each monopole site, much of the vegetation seen in this view would be retained. Overall, there would be a low magnitude of change and a **negligible visual impact** in views from this location.

Viewpoint 4: View south-west from the boat ramp access track, Kings Billabong Park

FIGURE 5-9: VIEW SOUTH-WEST FROM THE BOAT RAMP ACCESS TRACK, KINGS BILLABONG PARK

Location: 34°17'16.35"S, 142°14'31.93"E

Existing conditions: This view is located on an access track within the Kings Billabong Park. The Red Cliffs Substation and existing 220 kilovolt steel lattice structures can be seen in the middle to background of this view, with low vegetation and an access track along the transmission line corridor. The vegetation in this location includes trees within shrubland which screens view to the surrounding gently undulating terrain and frames the view along the corridor.

Sensitivity: This view is from an access road within Kings Billabong Park, leading to a recreational area on the Murray Riverbank which includes a boat ramp and picnic seating. The reserve is identified as environmentally significant (ESO1) in the *Mildura Planning Scheme* identified as a protected ecological area in the *Red River Gums Parks Management Plan*. Overall, this view is of **local visual sensitivity**.

Visual impact during construction: Construction activity would be seen in the fore and middle ground of this view. The proposal would be located on the eastern side of the existing transmission line (left of view), and two new monopole structures would be installed in front of the substation, adjacent to the existing structures. Site establishment works would be seen at the monopole sites, including the removal of shrubs and undergrowth and minor earthworks. There would be vehicles seen transporting materials and equipment along the the existing access tracks, and the vegetation within the proposed corridor would be trimmed to between two and four metres tall, widening the corridor to the east (left of view).

Works to install the transmission line structure foundations, erect the transmission line structure and string the wires would also be clearly visible. This work would include the use of large machinery such as excavators and graders, cranes, ground pulled draw wire or stringing drones as required. Once the proposal is operational, the existing 220 kilovolt transmission line would be removed. This work would be seen in the context of the existing substation and transmission lines.

Overall, there would be a moderate magnitude of change to this view which is of local visual sensitivity, and a **low visual impact** in views from this location.

Visual impact during operation: The existing transmission lines would have been removed and there would be two new steel monopole transmission line structures seen in the middle ground of this view, with the wires crossing overhead. While the monopole style structures would have a simpler form, they would be taller and have a greater visual mass. A wide corridor of vegetation would have been cleared or trimmed opening up views along the corridor and to the existing substation. Overall, there would be a moderate magnitude of change to a view which is of local visual sensitivity and a **low visual impact**.

Viewpoint 4: View south-west from river access track, Kings Billabong Park

FIGURE 5-9: VIEW SOUTH-WEST FROM RIVER ACCESS TRACK, KINGS BILLABONG PARK

Location: 34°17'16.35"S, 142°14'31.93"E

Existing conditions: This view is located on an access track within the remote riverside landscape of Kings Billabong Park. The existing 220 kilovolt steel lattice structures can be seen in the middle ground of this view, set within a partially cleared corridor. The unsealed track in the view foreground of this view provides access to the Murray River. The vegetation in this location includes blocks of dense vegetation as well as scattered trees within shrubland, which filter foreground views and screen the surrounding gently undulating terrain in the background.

Sensitivity: This view is from an access road within Kings Billabong Park, leading to a recreational area on the Murray Riverbank. The reserve is identified as environmentally significant (ESO1) in the *Mildura Planning Scheme* identified as a protected ecological area in the *Red River Gums Parks Management Plan*. Overall, this view is of **local visual sensitivity**.

Visual impact during construction: Construction activity would be seen in the foreground of this view. The proposal would be located on the eastern side of the existing transmission line (right of view), and the new monopole structure would be installed alongside the existing structure. Site establishment works would be seen at the monopole site, including removal of shrubs and undergrowth within the corridor and minor earthworks. There would be vehicles seen transporting materials and equipment along the the existing access track, in the foreground of this view. The vegetation in the corridor would be trimmed to between two and four metres tall, including much of the vegetation seen in this view.

Works to install the transmission line structure foundations, erect the transmission line structures and string the wires would be clearly visible. This work would include the use of large machinery such as excavators and graders, cranes, ground pulled draw wire or stringing drones as required. Once the proposal is operational, the existing 220 kilovolt transmission line would be removed.

Overall, there would be a moderate magnitude of change to this view which is of local visual sensitivity, and a **low visual impact** in views from this location.

Visual impact during operation: The existing transmission lines would have been removed and there would be two new steel monopole transmission line structures seen in the foreground of this view, with the wires crossing overhead. While the monopole style structures would have a simpler form, they would be taller and have a greater visual mass. A wide corridor of vegetation would have been cleared or trimmed, opening up views along the corridor somewhat. Overall, there would be a moderate magnitude of change to a view which is of local visual sensitivity and a **low visual impact**.

FIGURE 5-9: VIEW SOUTH-WEST FROM RIVER ACCESS TRACK, KINGS BILLABONG PARK, PHOTOMONTAGE

Views from the Murray River

Existing conditions: From this section of the Murray River there are views to a varied landscape including the dramatic colourful cliffs of the Red Cliffs Scenic Reserve, and vegetated flats of the Kings Billabong Park. There is also a convergence of existing transmission line infrastructure converging on the Red Cliffs substation, including several transmission line crossings of the river.

Sensitivity: This section of the Murray River is used by motorised and non-motorised vessels of varying sizes. This includes scenic river cruises offered from Mildura, with routes passing the Kings Billabong Park and Red Cliffs Scenic Reserve. There are also houseboats which are often seen moored in the vicinity of the Kings Billabong Park and Red Cliffs Scenic Reserve.

While the river is mainly used for recreational and tourist purposes, and there are several visual features, views from the Murray River would be of **regional visual sensitivity**.

Visual impact during construction: The construction footprint would be setback from the river edge so that there would be views mainly to the upper portions of the transmission line structures and stringing of the wires above the existing vegetation. Works to construct the proposal would be seen within the context of existing power infrastructure, including a substation and existing transmission line structures of varying sizes and styles.

While the work to construct the proposal would be visible rising above the existing vegetation within the Kings Billabong Park, it would be seen with a complex landscape containing existing power infrastructure. Overall, there would be a low magnitude of change in views from the Murray River, which are of regional visual sensitivity, resulting in a **low visual impact**.

Visual impact during operation: The proposal would result in taller transmission structures. The proposal would be visible rising above the existing vegetation within the Kings Billabong Park and would be seen within a complex landscape containing existing transmission line infrastructure. The proposal would therefore result in a low magnitude of change in views of regional visual sensitivity, and a **low visual impact**.

Views from the air

Existing conditions: Views from the air would include the urban outskirts of Mildura transitioning to rural uses, mainly irrigated arable farmland, including a mix of cereal crops, viticulture, and horticulture. The Murray River would be a visual feature passing through this landscape, with vegetation and cliffs.

Sensitivity: There are scenic flights offered from Mildura Airport, with routes over Mildura and Wentworth, across Lake Victoria, Mungo National Park and Yanga National Park, generally to the north-west and east of Red Cliffs. As these scenic flights are for tourist and recreational purposes, the views from these flights would be of **regional visual sensitivity**.

Visual impact during construction: The construction footprint would be located to the south-east of Mildura, extending north-east from the Red Cliffs substation towards and crossing the Murray River. The line created by the proposal would be generally parallel with the existing Buronga to Red Cliffs transmission line, which would be removed. The clearing of vegetation would be visible with construction equipment visible within the construction footprint. Works to construct the proposal would be seen within the context of existing electricity infrastructure, including a substation and transmission line structures.

While the work to construct the proposal would be visible unobstructed from the air, it would be seen with a complex landscape containing existing power infrastructure, resulting in a low magnitude of change and a **low visual impact**.

Visual impact during operation: While the proposal would be seen unobstructed from the air, it would replace an existing set of four transmission line structures and extend across a small area of the landscape. Overall, the proposal would not change the prevailing character of views from the air, resulting in a negligible magnitude of change and a **negligible visual impact**.

5.3. Summary of daytime 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 **negligible** visual impact. These impacts are listed in Table 5-1.

TABLE 5.1 SUMMARY OF VISUAL IMPACTS

			Construction		Operation	
No.	Location	Visual sensitivity	Magnitude of change	Visual impact	Magnitude of change	Visual impact
1	View north-west from Red Cliffs Scenic Reserve lookout	Regional	Low	Low	Low	Low
2	View north-west from Red Cliffs Scenic Reserve	Local	Negligible	Negligible	Negligible	Negligible
3	View east from Woomera Avenue	Neighbourhood	Low	Negligible	Low	Negligible
4	View south-west from the boat ramp access track, Kings Billabong Park	Local	Moderate	Low	Moderate	Low
5	View south-west from river access track, Kings Billabong Park	Local	Moderate	Low	Moderate	Low
	Views from the Murray River	Regional	Low	Low	Low	Low
	Views from the air	Regional	Low	Low	Negligible	Negligible

5.4. Assessment of night-time impacts

The following section will summarise an assessment of the night-time impacts of the proposal.

Sensitivity: At night this landscape would have low light levels with limited developed areas within the Kings Billabong Park, Red Cliffs Scenic Reserve, and along the Murray River. Surrounding the river there are scattered rural residences and some small clusters of residences in surrounding rural areas. Vehicles travelling along local roads such as Woomera Avenue would contribute to the light levels. The sky glow from nearby settlements such as Red Cliffs, Irymple and Mildura may also influence the light levels in this character area. Overall, this landscape is an area of low district brightness (A2) and has a moderate visual sensitivity at night.

Visual impact during construction: Works along the transmission line corridor would occur between 7am-7pm, 7 days a week. Consequently, there would be lighting required during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting associated with works along the corridor, in areas used for storage and laydown ancillary areas and from the headlights from staff and construction vehicles accessing and moving within the disturbance area.

This lighting is likely to contrast somewhat with the surrounding area of low district brightness. However, there would be few receptors to this activity as the proposal is largely contained within vegetation and in areas which are used predominantly for recreation during the day. If visible, the effect of lighting would only occur for a short duration each day and for a short time within the construction program.

Overall, there would be a low magnitude of change to this landscape which is of moderate sensitivity, and a **low visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line. Therefore, there would be a negligible magnitude of change to this landscape which is of moderate sensitivity, and a **negligible visual impact** at night during operation.

6. Mitigation measures

The following mitigation measures should be considered to further reduce the potential visual impacts identified in this assessment.

TABLE 6-1: MITIGATION MEASURES

Reference	Mitigation measure	Timing	Applicable location(s)
LV1	Opportunities for the retention and protection of existing trees within the disturbance area will be identified during detailed construction planning.	Detailed design	Whole of proposal
LV2	Existing access tracks will be used where possible to minimise vegetation removal, changes to landform, and visual impacts.	Detailed design	Whole of proposal
LV3	Proposed permanent engineering batters and water management measures will be designed to integrate with the existing landforms and natural features.	Detailed design	Whole of proposal
LV4	Vegetation within or immediately adjacent to the disturbance area will be protected through the restriction of construction activities in accordance with the No-go Zone procedure defined within Table 5.1 of the Flora and Fauna Impact Assessment, to minimise the impact of the works on the long term health of these trees.	Pre-construction	Whole of proposal
LV5	Maintain park access to recreational areas during construction.	Construction	Whole of proposal

7. Conclusion

7.1. Landscape impact

The landscape and visual study area include landscapes of local and regional landscape sensitivity which would be directly impacted by the removal of vegetation and changes to the character of recreational areas as a result of the proposal. Overall, these impacts would be low during construction and operation of the proposal. This is due to the relatively small area of direct impact with the proposal being located alongside an existing transmission line and within the context of other existing electricity infrastructure. The proposal would require some vegetation clearing and trimming but minimal landform changes. The proposal avoids impacts upon the important landscape features, by being set back from the river edge and the Red Cliffs. Those visual impacts which have been identified have a **low landscape impact** during construction, and **low landscape impact** during operation.

7.2. Visual impact

Overall, the visual impacts of the proposal are relatively low and have a relatively small influence.

There would be a **low visual impact** from the lookout at the Red Cliffs Scenic Reserve during construction. This view is of greater sensitivity and the vantage point provides greater visibility of the proposal. During operation this impact would remain a **low visual impact** due to the scale of the proposed transmission structures and the sensitivity of this viewing location. In other areas of the scenic reserve the proposal would be less visible due to the viewing position and intervening vegetation, resulting in a **negligible visual impact**.

There would be **negligible visual impact** experienced in views from the residential properties on Woomera Avenue during construction, as there would be some work visible from this seen in the context of the existing substation and power infrastructure. During operation this impact would remain a **negligible visual impact**, as the proposed transmission line corridor is located behind the existing substation and would be absorbed into the character of the existing view.

From the recreational areas and tracks within the Kings Billabong Park there would be a **low visual impact** during construction, experienced in areas where the proposal is visible, such as the existing access tracks that cross the proposed corridor. This impact would remain a **negligible** during operation as the proposal would replace an existing 220 kilovolt transmission line and would have a similar character and visual influence within this area. There would not be any views to the proposal from the boat ramp, however, there would be views from the foreshore of the park to the transmission line crossing between Victoria and NSW.

In views from vessels within the Murray River and in views from the air there would be a **low visual impact** during construction due to the additional vegetation clearing and scale of construction activity that would be seen as the proposal is constructed over and on the bank of the river. During operation, the proposal would have a **low visual impact** due to the increased visual prominence of the transmission line structures in this view.

In views from the air, there would be a **low visual impact** during construction due to the removal of vegetation and scale of the machinery and installation of the transmission line structures seen in the vicinity of the Murray River and Red Cliffs Scenic Reserve. However, during operation the visual impact would be **negligible** as the proposal would be seen in the context of an existing transmission infrastructure and would be largely absorbed into the character of the views from the air.

7.3. Visual impact at night

At night there would be a **low visual impact** during construction of the proposal. The works may on occasion extend beyond standard work hours and require lighting. The duration when there would be lighting required along the transmission line construction areas would be short and direct light sources would be generally screened by the surrounding vegetation. There may be some skyglow above the vegetation seen from surrounding residential areas, however, these properties are not located near to the corridor. There may also be some lighting visible from the park and surrounding recreational areas which would not have high usage at night.

During operation this would reduce to a **negligible visual impact** as there is no permanent lighting proposed.

7.4. Mitigation measures

There are opportunities for landscape and visual mitigation during both construction and operation of the proposal. This would include detailed construction planning and detail design to minimise impacts on vegetation and maintain park access for recreational users during construction.

8. References

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