moir STUDIO

Romani BESS

Landscape Character and Visual Impact Assessment

We at Moir Studio acknowledge the traditional custodians of the lands and waters of Australia - most notably the Awabakal Nation in which our office resides and the Wiradjuri, Wemba Wemba & Nari Nari Nations, on whose traditional land this Project resides. As a practice, we recognise First Nations' ongoing contribution to Country and deep spiritual connection to Place. We pay our respects to Elders both past and present.

Romani BESS

Landscape Character and Visual Impact Assessment

Prepared for
ERM

Project Number
2466

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Glossary of Terms

Associated Dwelling
A dwelling on privately owned land on which the owner has reached an agreement with the Proponent about the Project and management of impacts

Bioregion
An ecologically and geographically defined area characterised by its combination of geological features, climate, flora and fauna.

Community Consultation
The process of engaging with the local community and stakeholders to gather feedback, address concerns and involve the public in the decision-making process of the Project.

Cumulative Visual Impact
The combined effects of multiple projects on the visual catchment in which the Project is proposed over time.

Dwelling Entitlement
Refers to lots where dwellings may be built in relation the Local Environment Plan (LEP) requirements.

Geographical Information Systems (GIS)
A system that captures, stores, analyses, manages and present data link to specific locations. This spatial data is linked to a digital database.

Land Zoning
The classification of land for specific uses or activities - typically regulated by local environment planning documentation and/or relevant State Environmental Planning Policy (SEPP) documentation.

Land Use
The way the existing land is utilised, including but not limited to residential, commercial, industrial, agricultural, or conservation purposes.

Landscape
All the visible features, including landform, vegetation, buildings and infrastructure, contained within a holistic area.

Landscape and Visual Impact Assessment (LCVIA)
A technical assessment to identify and assess the potential visual effects resulting from the Project on the landscape, individual receivers and on the overall visual amenity of the region in which the Project is sited.

Landscape Character Zones
An area of landscape with similar properties or strongly defined spatial qualities that are distinct from areas immediately nearby within the Study Area.

Mitigation Measures
Potential strategies or actions implemented to minimise or offset the adverse visual impacts of the Project.

Non-Associated Dwelling
Any neighbouring party in proximity to a proposal that has not agreed to a neighbour agreement for the Project.

Photographic Survey & Fieldwork
A systematic process of collecting visual data in the form of photographs and surveys taken from various viewpoints within the Study Area to document the existing visual conditions.

The Project
The proposal and associated infrastructure that would allow energy generation and storage.

Project Area

The area that encompasses all properties hosting the Project.

Renewable Energy Zone

A designated area to support renewable energy development as declared in the Electricity Infrastructure Investment Act 2020.

Secretary's Environmental Assessment Requirements (SEARs)

Secretary's Environmental Assessment Requirements (SEARs) outlines the environmental assessment requirements for State Significant Projects. The SEARs will normally include specific requirements for landscape character and visual impact assessments

State Environmental Planning Policies (SEPPs)

Legislation and policies at both the state and local levels that determine the regulations governing the development of activities on a property. State Environmental Planning Policies (SEPPs) are applicable statewide, while Local Environmental Plans (LEPs) establish the specific planning regulations for individual local government areas

Abbreviations

Study Area

The geographical region or area under consideration in the preparation of an LCVIA.

Viewpoint

A specific location from which a view or landscape is observed. A viewpoint location is the geographic location or physical position (in GPS format) where the viewpoint was captured.

Visual Baseline

A desktop assessment and onsite photographic surveys/ fieldwork that describes and captures the existing environmental conditions in which any future changes can be measured against.

Visual Impact

The observable and measurable change in the visual catchment caused by the Project. This is determined by considering the visual sensitivity and magnitude of change.

Visual Magnitude

The degree of visual change resulting from the Project, including but not limited to the size, scale, compatibility and duration of effect.

Visual Receptors

Individuals and / or defined groups of people who have the potential to be affected by the Project.

Visual Sensitivity

The susceptibility of a landscape or visual resource to absorb impacts from a Project, land use change or the introduction of a new element into the landscape.

Zone of Visual Influence (ZVI) | Viewshed Mapping

The extent of landscape area from which the Project can potentially be theoretically viewed based on topography alone.

Abbreviations

AGL
Above Ground Level

BESS
Battery Energy Storage System

DPHI
Department of Housing and Infrastructure

EIS
Environmental Impact Statement

IBRA
Interim Biogeogrpahic Regionalisation of Australia

kV
Kilovolt

LALC
Local Aboriginal Land Council

LCZ
Landscape Character Zone

LEP
Local Environmental Plan

LGA
Local Government Area

LCVIA
Landscape and Visual Impact Assessment

NPWS
National Park and Wildlife Service

NSW
New South Wales

PV
Photovoltaic/Solar Panels

REZ
Renewable Energy Zone

SEARs
Secretary's Environmental Assessment Requirements

SEPP
State Environmental Planning Policy

SSD
State Significant Development

SW-REZ
South West Renewable Energy Zone

ZVI
Zone of Visual Influence / Viewshed Mapping

01 Introduction

1.0 Introduction

1.1 Introduction

ERM has commissioned Moir Landscape Architecture Pty Ltd (trading as Moir Studio) to prepare a Landscape Character and Visual Impact Assessment (LCVIA) of the Romani BESS (the Project) for Samsung C&T Renewable Energy Australia Pty Ltd (the Proponent).

This report supports a State Significant Development (SSD) Development Consent application under Part 4, Division 4.7 of the Environmental Planning and Assessment Act 1979 (SSD-67105475) and will form part of the Environmental Impact Statement (EIS) for the Project.

The Proponent is proposing the construction, operation and decommissioning of a lithium-ion Battery Energy Storage System (BESS) with a storage capacity of 200MW / 800MWh.The Project is located within the Southwest Renewable Energy Zone (SW-REZ) of New South Wales (NSW). The Project is located approximately 44 kilometres (km) southwest of Hay and 80 km northwest of Deniliquin, within the Edward River Local Government Area (LGA).

1.2 Professional Experience

Moir Studio is a professional design practice and consultancy specialising in Landscape Architecture, Urban Design and Landscape Character and Visual Impact Assessment. Our team has extensive experience undertaking LCVIA's for large-scale infrastructure and renewable energy projects. Drawing on this experience in conducting LCVIA's, we have developed methodologies to ensure a comprehensive and qualitative assessment of the Project. Our relevant experience includes:

- Wagga Wagga North BESS
- Deniliquin BESS
- Armidale East BESS
- Kingswood BESS

1.3 Report Structure

The Secretary's Environmental Assessment Requirements (SEARs) for the Project, issued on the 19/06/2025, states that the EIS must address specific issues for the BESS and associated infrastructure relating to potential visual impacts. **Table 01** provides an overview of the SEARs requirements and where these have been addressed in the LCVIA.

SEARs REQUIREMENT REFERENCE	
SEARs Requirements	Relevant Section of LCVIA
A detailed assessment of the likely visual impacts of all components of the project on surrounding residences (including approved developments, lodged development applications and dwelling entitlements), and key locations, scenic or significant vistas and road corridors in the public domain	**Section 4.10** Landscape Character Assessment **Section 5.1** Zone of Visual Influence **Section 5.2** Viewpoint Analysis **Section 5.5** Photomontages **Section 5.11** Dwelling Entitlements **Section 5.12** Cumulative Visual Impacts
Details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners)	**Section 6.1** Mitigation Recommendations

Table 01 Overview of SEARs

02 Study Method

2.0 Study Method

1.4 Overview of Study Method

The fundamental steps in undertaking an LCVIA for a BESS are outlined in **Figure 01.**

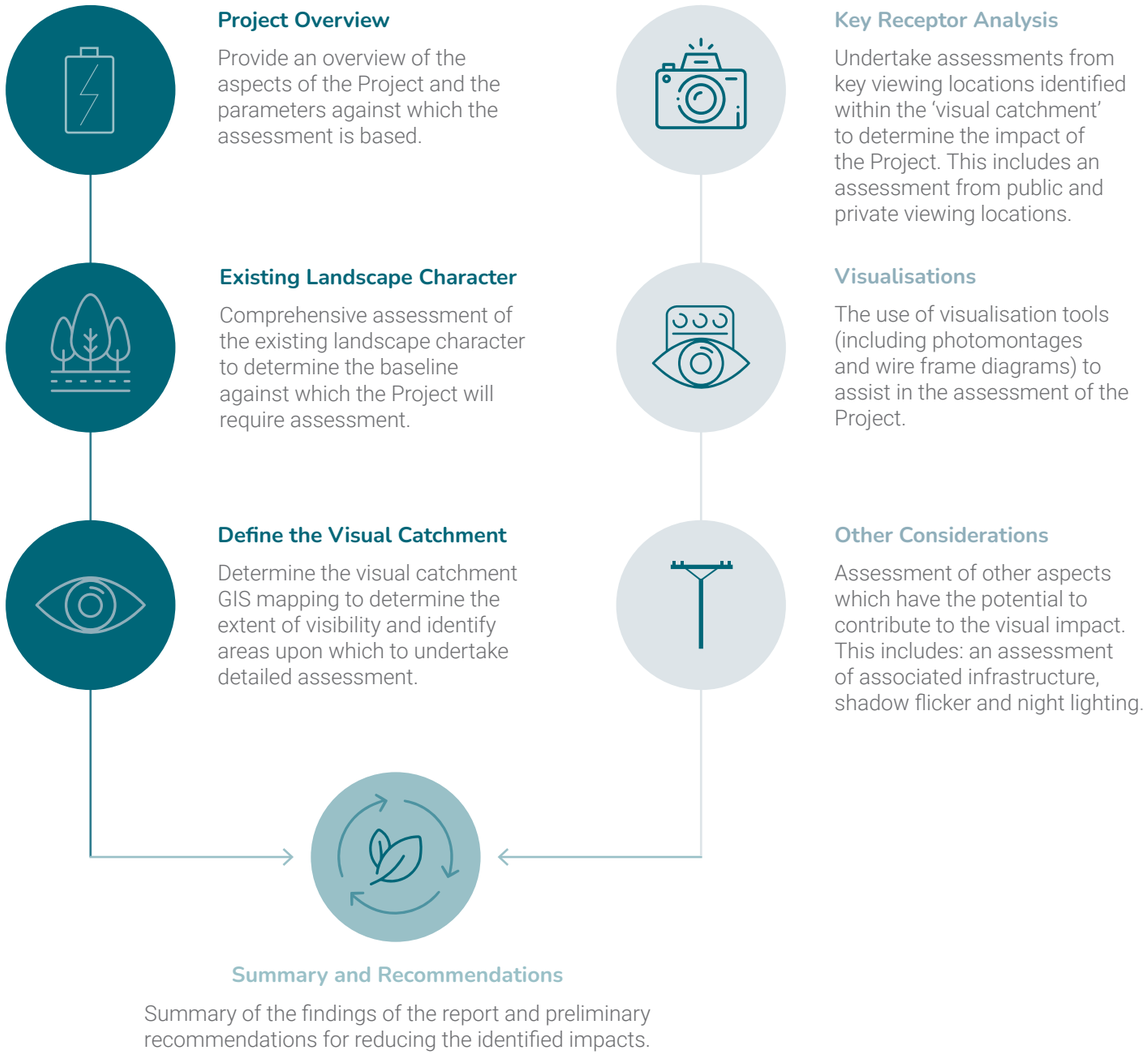


Figure 01 LCVIA Process

1.5 Relevant Guidelines & Framework

NSW does not have defined LCVIA guidelines specifically for the assessment of BESS proposals. The following provides an overview of the relevant frameworks and considerations of authorities utilised to form the methodology for this LCVIA.

1.5.1 AILA Guidance Note for Landscape & Visual Impact Assessment 2018

The Australian Institute of Landscape Architects (AILA) developed Guidance Notes for preparing LCVIAs. This document provides a practical framework for the practice of LCVIA among Registered Landscape Architects. The LCVIA process follows the best practice guidelines outlined in the Guidance Notes, which cover terminology, principles, and methodology.

1.5.2 Transport for NSW - Guideline for Landscape Character & Visual Impact Assessment 2023

This document provides guidance for preparing landscape character and visual impact assessments for road and maritime projects, aligning with Beyond the Pavement. It supports planning, design, and environmental assessments to inform project teams and environmental approvals under the Environmental Planning and Assessment Act 1979 (EP&A Act). The document establishes terminology, processes, and methodologies to ensure consistent, high-quality assessments that are integrated with environmental, design, and project management efforts outlined in the Infrastructure Life Cycle Management System (TNSW, 2023).

1.5.3 Department of Planning, Housing and Infrastructure - Large Scale Solar Energy Guideline 2024

While the Project does not specifically fall under these guidelines, the scale and unit size of a BESS are similar to those of a solar development. Therefore, terminology and methodologies from this guideline have be incorporated into this LCVIA.

03 Project Overview

3.0 Project Overview

3.1 Regional Context

The Project is located to the northwest of Booroorban, approximately 44 km southwest of Hay within the Edward River LGA.

The land use within the Project Area is historically and currently used for agricultural activities and is located north of The Forest Creek. The topography is flat, with little to no undulation across the region.

3.2 The Project

The Project includes the construction, operation and decommissioning of a BESS, ancillary electrical and civil engineering works. The construction period for the Project is predicted to be 20 months, with an average construction work force of 30-50 full time equivalent workers, and at peak times around 80-100 full time equivalent workers. The operational workforce would consist of 3-5 full time equivalent workers. The Project includes the following key components:

- Lithium-ion BESS with a storage capacity of 200 MW / 800MWh
- Electrical reticulation network that is comprised of a 220kV substation and grid connection to the existing X5 transmission line
- Permanent operations and management (O&M) facility, control room/switch room
- Landscaping works, asset protection zones, access tracks and drainage
- Vehicle access to/from Booroorban-Tchelery Road
- Road upgrades at the intersection of Booroorban-Tchelery Road and Cobb Highway

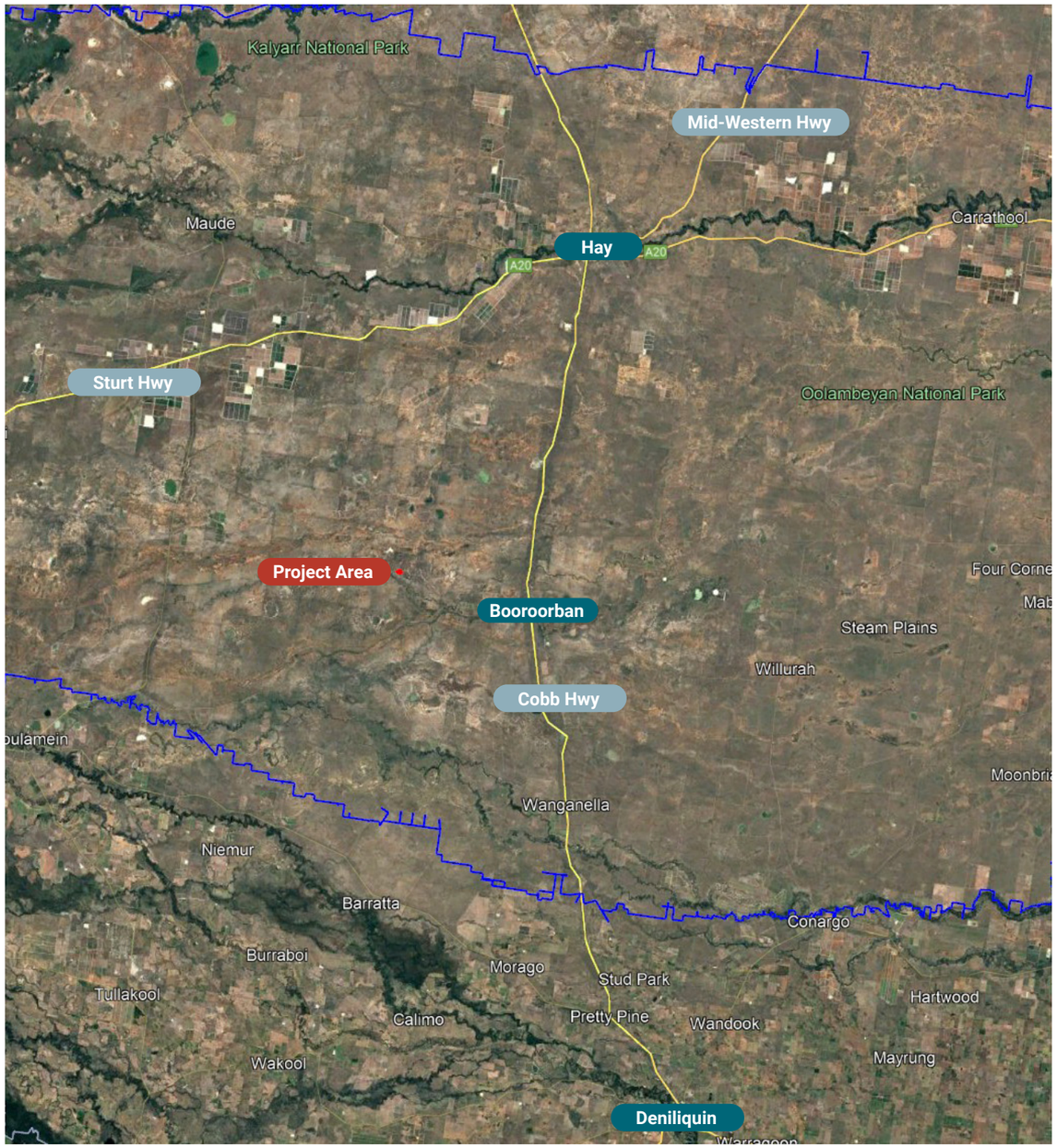
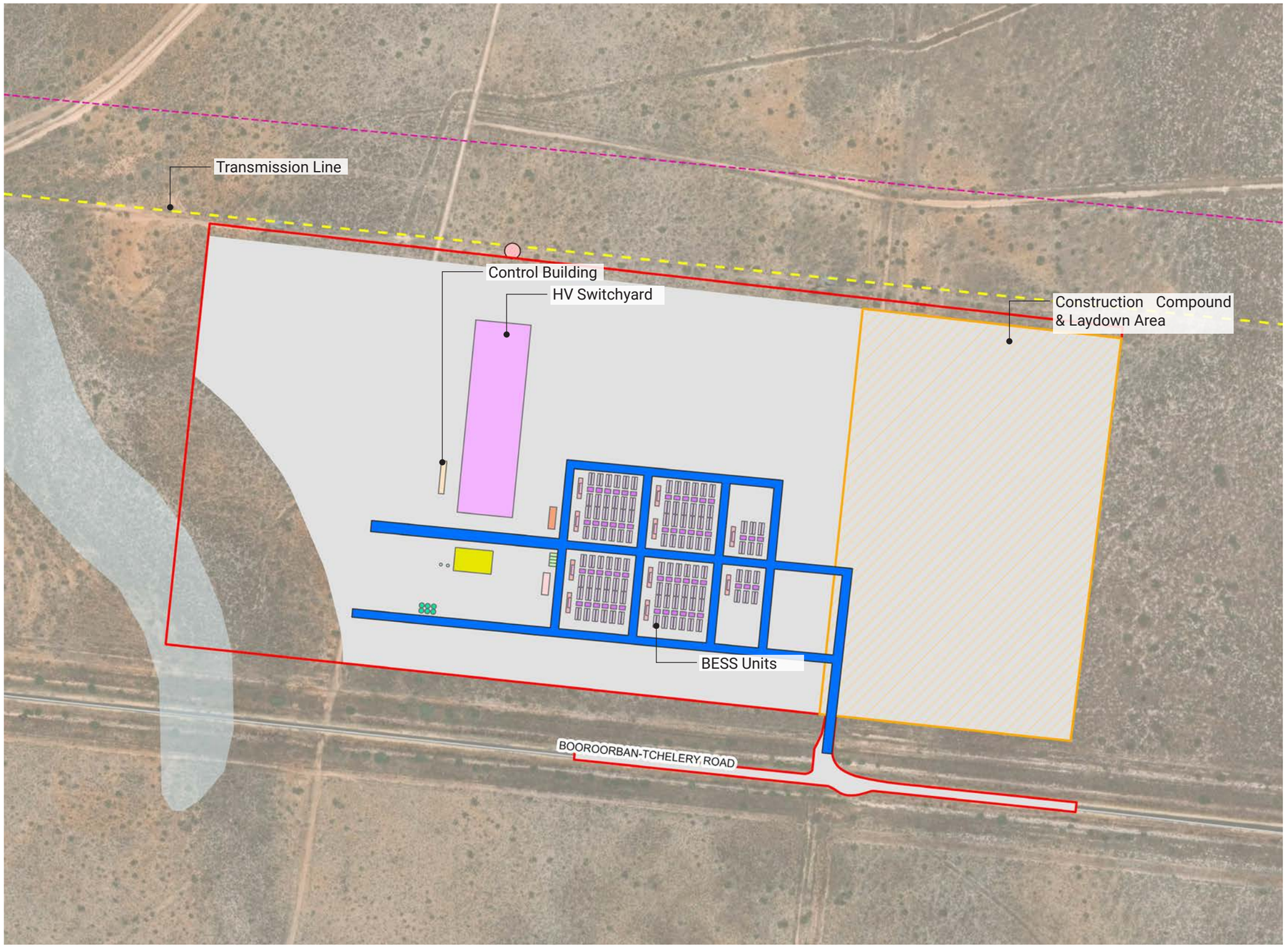


Figure 02 Regional Context
Basemap Source - Google Earth, 2021



Indicative Project Layout

Refer to Section 3.2

LEGEND

- Site Boundary
- Development Footprint
- Construction Compound
- Connection to X5 Transmission Line
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Internal Road
- Battery Units
- Car Parking Space
- Control Building
- Earthing Transformer
- Elevated Platform
- Fire Water Tank Pumps & Booster
- HV Switchyard
- Main Transformer
- Step-Up Transformer
- Switchgear Building 1
- Switchgear Building 2
- Underground 33kV Cabling
- Roads
- Watercourses and Dams

0 50 100 150 200 m

Figure 03 Project Layout
Basemap Source - ESRI, 2024

04 Landscape Character Assessment

4.0 Landscape Character Assessment

4.1 Landscape Character Assessment Overview

Landscape Character refers to the distinct and recognisable pattern of elements that occur consistently in a particular landscape. The Landscape Character of an area is generally defined by the most dominant landscape element or unique combination of elements that occur within that landscape. It '*reflects how particular combinations of geology, landforms, soils, vegetation, land use and human settlements create a particular sense of place for different areas within the landscape*' (Landscape Institute, 2013).

The following provides an overview of the requirements of the landscape character assessment.

4.1.1 Step 1 - Baseline Analysis

A baseline study must be conducted to assess the landscape character of the area and its sensitivity. This study should be based on both desktop research and field visits, providing a descriptive and visual analysis of the site's qualities, key values, and potential challenges associated with the Project. An on-site field study was conducted in February 2025 using key viewpoints within the localised region defined as the Study Area in **Section 4.2.**

4.1.2 Step 2 - Identify Landscape Character Zones

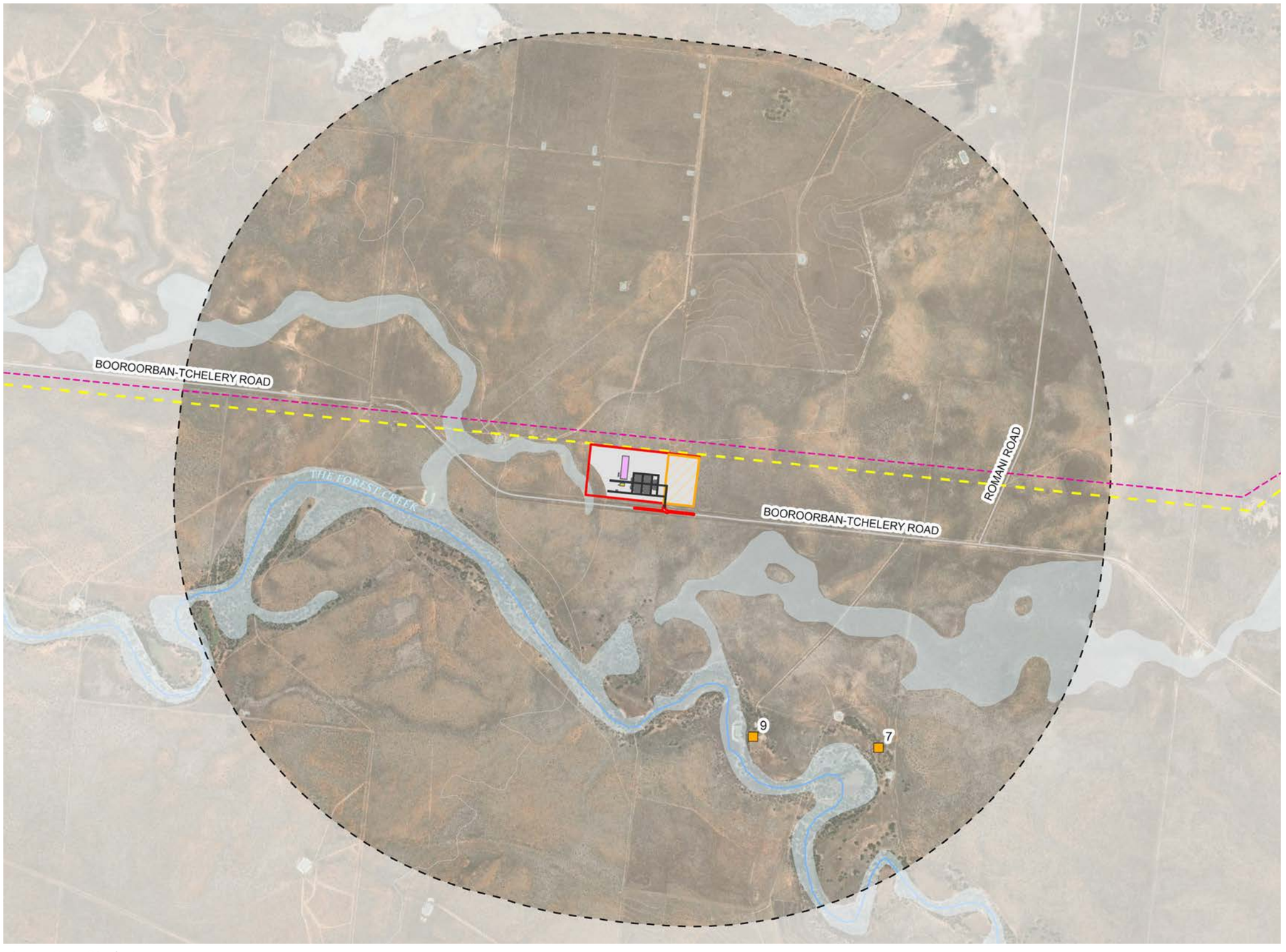
Where the landscape has distinct areas of differing qualities, the landscape should be divided into different Landscape Character Zones (LCZs).

4.1.3 Step 3 - Assess Landscape Character Impact

The identified LCZs are assessed to determine the sensitivity of the landscape in each zone and the magnitude of the Project's visual impact on the landscape.

4.2 Landscape Character Study Area

The Landscape Character surrounding the Project has been assessed at a regional, local and site scale. This assessment will utilise existing topographic maps, site imagery and land use maps using 2.5 km kilometres as the defined 'Study Area' from the Project Layout. The Study Area does not include the proposed upgrades at Booroorban-Tchelery Road and Cobb Highway.



Study Area

Refer to Section 4.2

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Non-Associated Dwellings
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Named Watercourse
- Contours
- Watercourses and Dams

0 0.3 0.6 0.9 1.2 km

Figure 04 Study Area
Basemap Source - ESRI, 2024

4.3 Bioregion

The Project is situated centrally within the NSW Riverina Biogeographic Regionalisation of Australia (IBRA) Bioregion. The Riverina Bioregion covers an area from Ivanhoe in southwest NSW to Bendigo in Victoria and from Narrandera in the east to Balranald in the west.

River channels, floodplains, backplains, swamps, lakes and lunettes dominate the Riverina Bioregion. The Project is situated within the Murrumbidgee Subregion, which is characterised by vast, flat plains with depressions and distributary channels. The significant tributaries across the Bioregion include the Murray, Murrumbidgee and Lachlan Rivers (NPWS, 2003).

Within the Murrumbidgee subregion, the bioregion's features are defined as:

Geology: The geology of the area features quaternary alluvial sediments, clay and sand with source bordering dunes and lakes.

Characteristic Landforms: The topography features flat alluvial fans and floodplains, with some depressions. Source-bordering dunes are common.

Vegetation: River red gum (*Eucalyptus camaldulensis*) and river cooba (*Acacia stenophylla*) is found in riparian zones and channels. The plains are dominated by saltbush and blue bush communities, including old man saltbush (*Atriplex nummularia*), cotton bush (*Maireana aphylla*), and native grasslands, including Danthonia spp. and Stipa spp. (NPWS,2003).

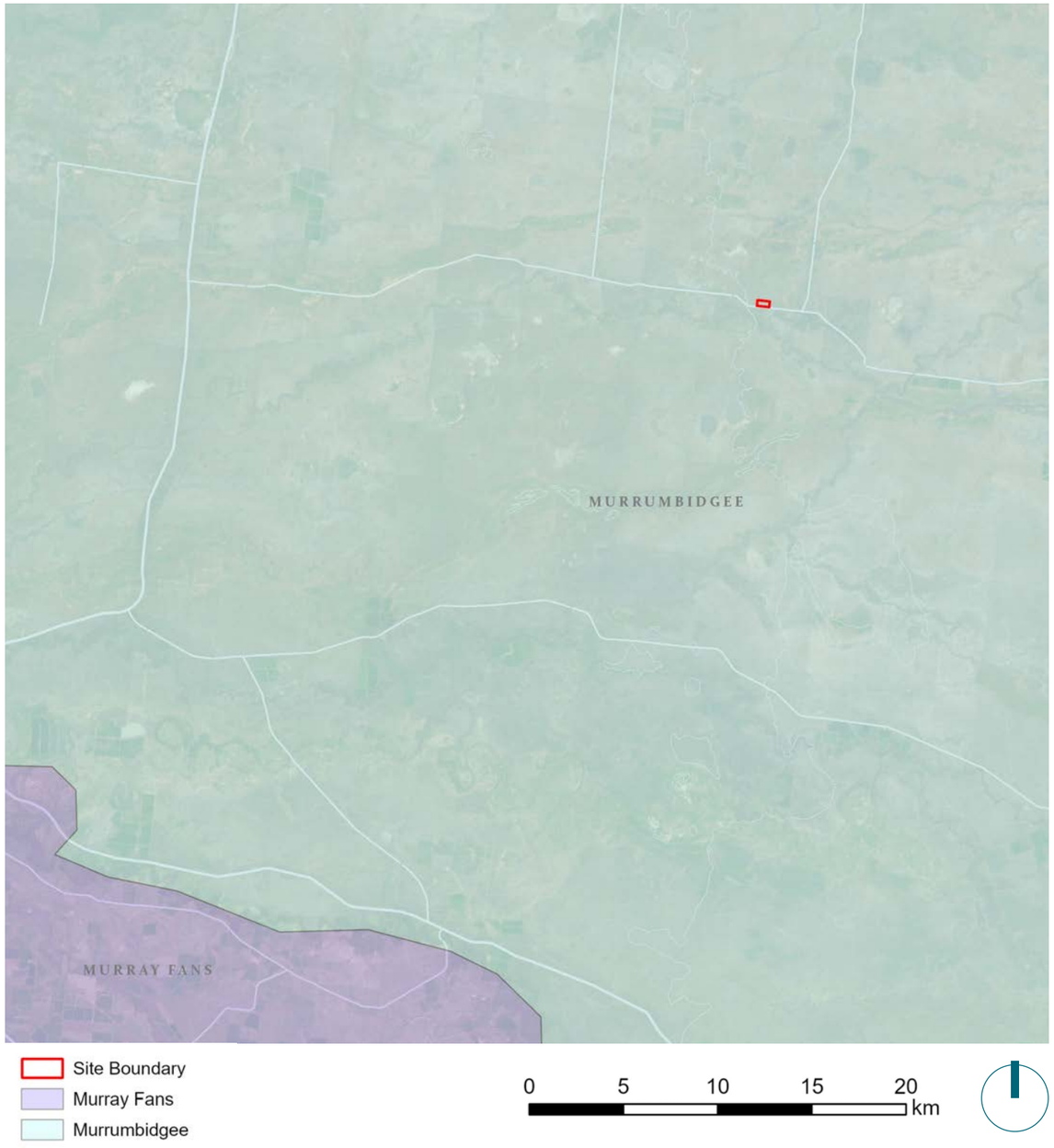


Figure 05 Sub-bioregion
Basemap Source - ESRI, 2024

4.4 Land Zoning

The Project is located within the Edward River Council Local Government Area (LGA) where the Edward River Local Environmental Plan (LEP) 2013 applies. The following provides an overview of the land zoning within the immediate surrounds of The Project.

4.4.1 RU1 Primary Production

The land within the Study Area is entirely zoned as RU1 - Primary Production as shown in **Figure 06**. One objective identified in the LEP relating to visual impact for this zoning type is "*To allow for the development of non-agricultural land uses that are compatible with the character of the zone.*"

4.5 Land Use

Land Use within the Study Area as shown in **Figure 07**, as defined by land use mapping published by the NSW Government in 2017 (SEED, 2019), predominantly comprises:

- Grazing native vegetation
- Cropping
- Irrigated cropping
- Marsh/wetland

The Project Site and immediate surrounds compromise of grazing native vegetation and marsh/ wetland.

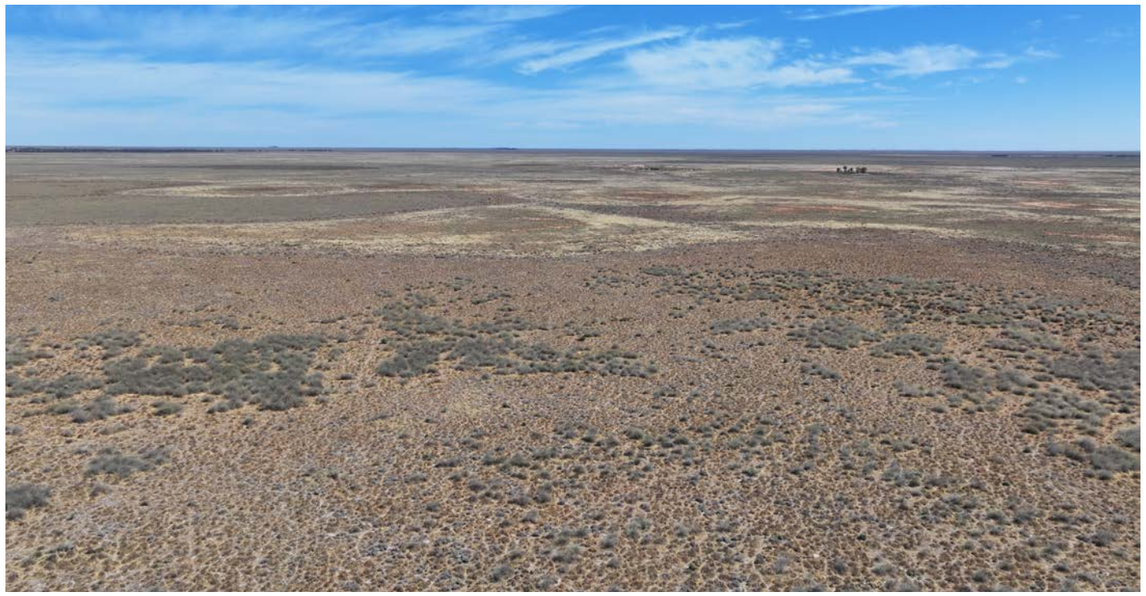
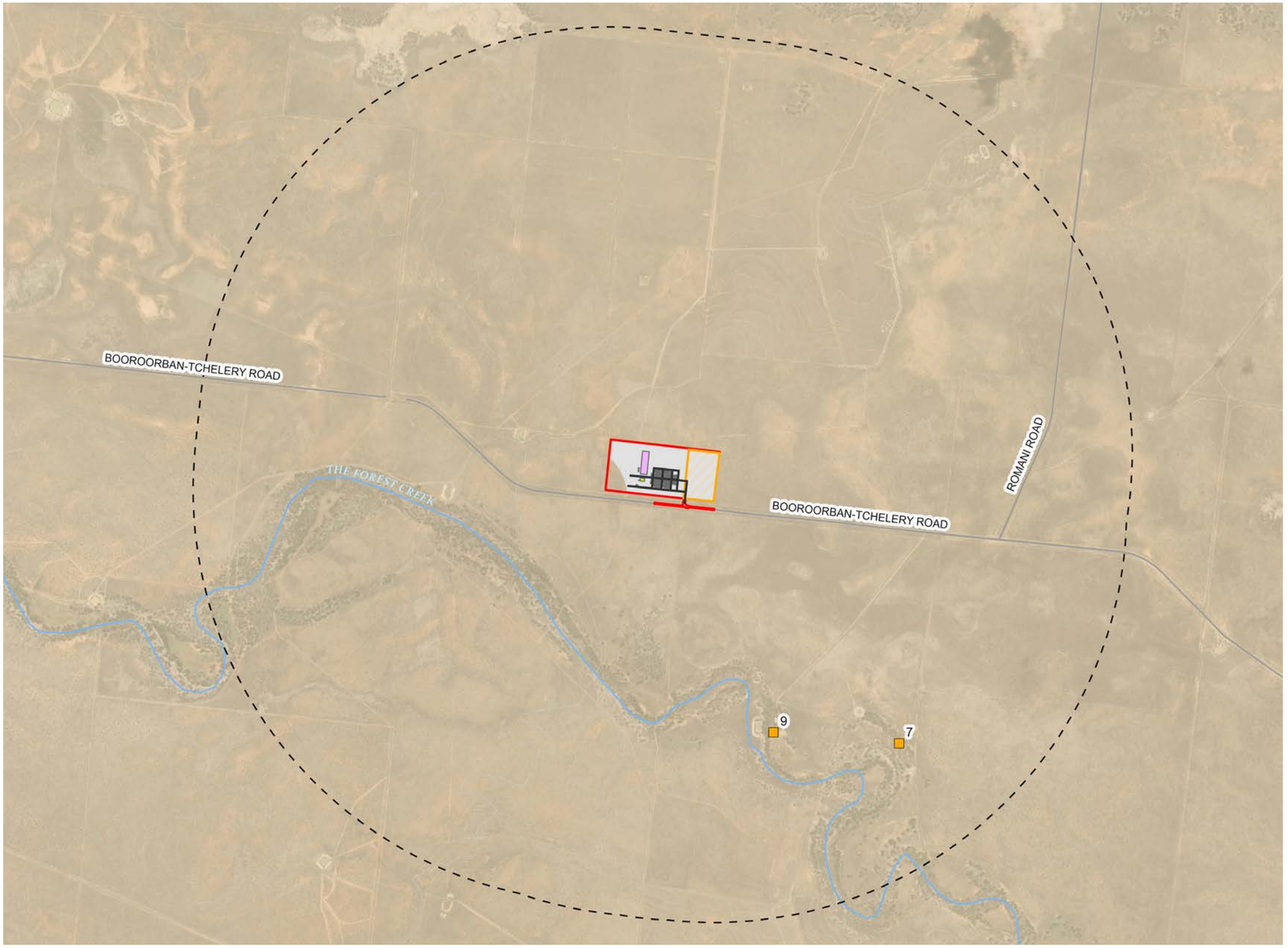


Image 01 Vast saltbush plains typical of Study Area

Image 02 Saltbush plains viewed from Booroorban-Tchelery Rd



Land Zoning

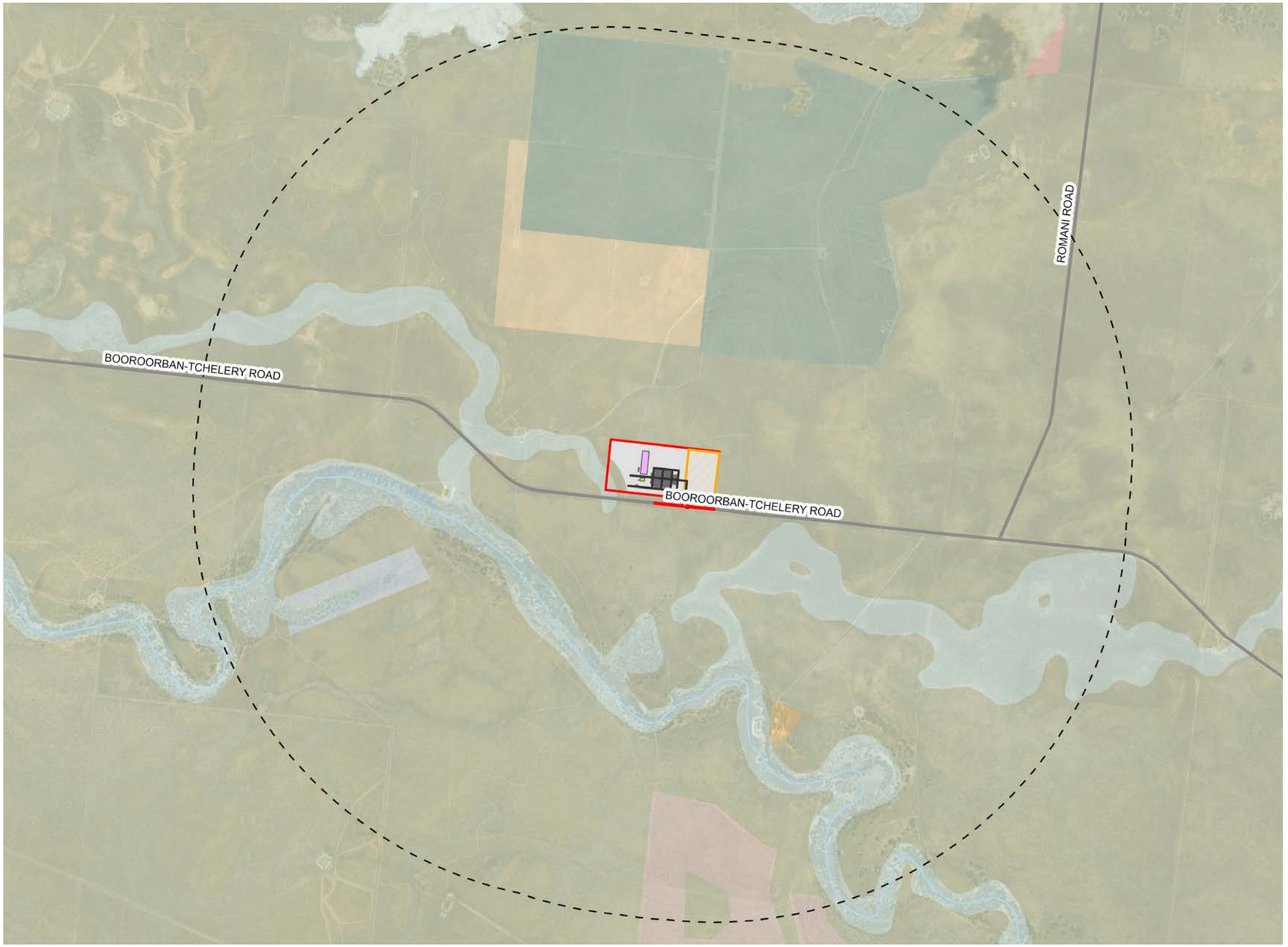
Refer to Section 4.2

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Non-Associated Dwellings
- RU1
- Roads
- Named Watercourse

0 0.3 0.6 0.9 1.2 km

Figure 06 Land Zoning
Basemap Source - ESRI, 2024



Land Use

Refer to Section 4.3

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Named Watercourse
- 1.2.0 Managed resource protection
- 2.1.0 Grazing native vegetation
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.2.0 Grazing irrigated modified pastures
- 4.3.0 Irrigated cropping
- 5.4.5 Farm buildings/infrastructure
- 5.7.2 Roads
- 6.5.0 Marsh/wetland

0 0.3 0.6 0.9 1.2 km

Figure 07 Land Use
Basemap Source - ESRI, 2024

4.6 Key Landscape Features

4.6.1 Topographical Character

The Project is situated within the Murrumbidgee Subregion, which is characterised by vast, flat plains with depressions and distributary channels. The landform within the Project Area is characterised by flat, open and often treeless plains with little change in elevation across the Site and the Study Area overall.

4.6.2 Hydrological Character

The Study Area includes a number of ephemeral creeks and dams, as well as Forest Creek, that eventually drains into the Edward River. The Forest Creek is located approximately 400 m to the south of the Project Area at its closest point. The area also features shallow depressions that act as a refuge for excess water. The Forest Creek is the closest and only permanent creek in the Study Area, located to the south of the Project Area. Several artificial dams and canals provide water for agricultural activities within the Study Area.

4.6.3 Vegetation Character

The Study Area has a dry semi-arid climate and features flat, agricultural areas characterised by treeless plains of saltbush and native grasslands. The plains are dominated by saltbush and blue bush communities, including old man saltbush (*Atriplex nummularia*), cotton bush (*Maireana aphylla*), and native grasslands, including Danthonia spp. and Stipa spp. (NPWS,2003).

The riparian vegetation along The Forest Creek is the only contrasting feature within the landscape, with the riparian vegetation becoming the only natural focal point on the horizon. Vegetation communities of black box (*Eucalyptus largiflorens*) and lignum (*Muehlenbeckia florulenta*) follow The Forest Creek, which forms a key landscape feature in the Study Area. Some areas of black box and lignum are found on floodplains and depressions.

Image 03 Riparian vegetation along Forest Creek

Image 05 Agricultural dam and Forest Creek riparian corridor

Image 04 Blackbox adjacent to the riparian corridor

4.6.4 Roads

The Cobb Highway is located 14 km to the east of the Project Area and is the main highway that runs north - south and connects the towns of Hay in the north, to Deniliquin and Echuca in the south.

Within the Study Area, the only two roads are Booroorban-Tchelery Road and Romani Road, both are low-use roads generally used for access to rural dwellings. Booroorban-Tchelery Road is located adjacent to he southern boundary of the Project Area, while Romani Road is an unsealed road that passes through the eastern side of the Project Area.

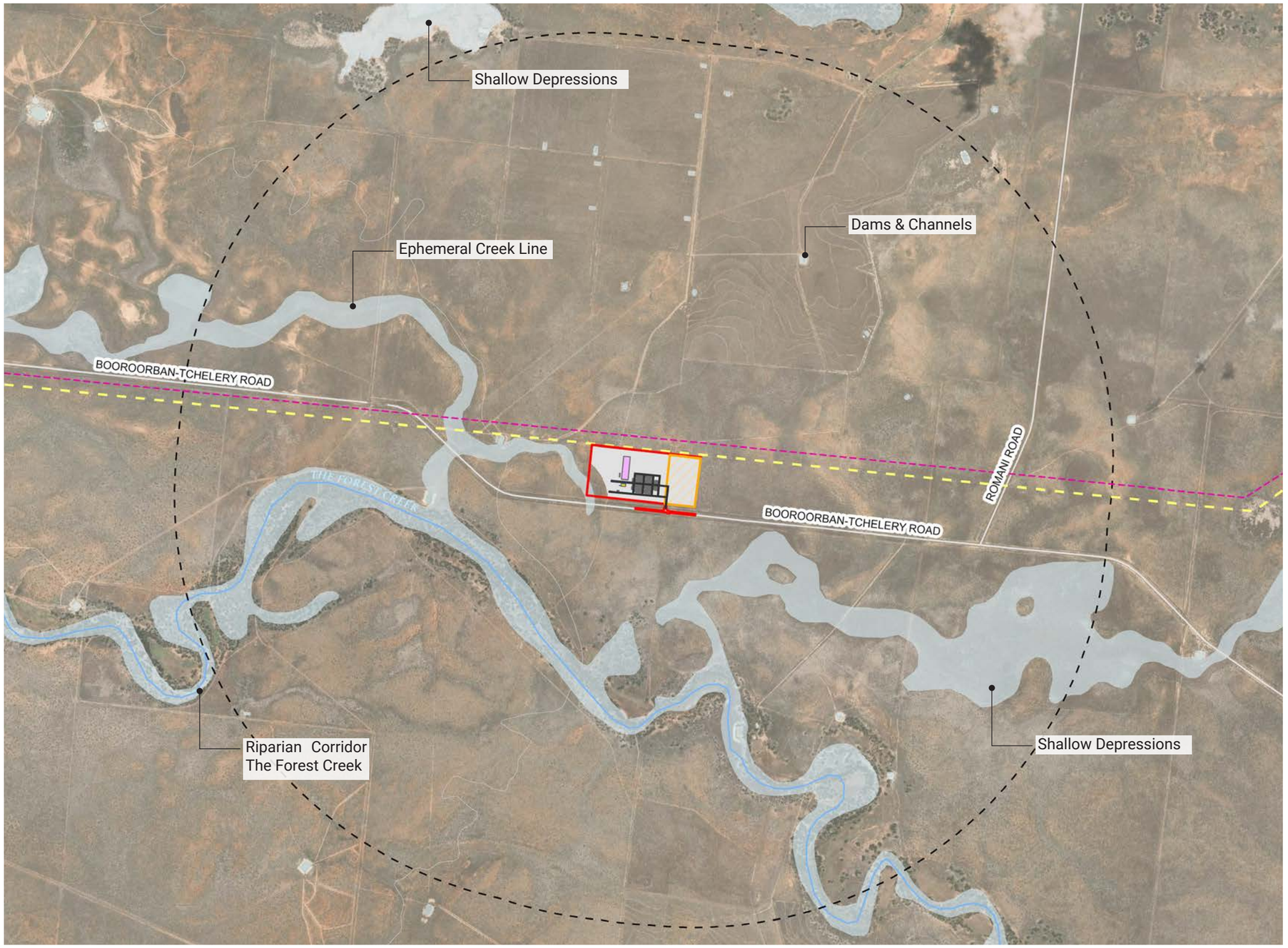
4.6.5 Infrastructure

There are no towns or localities located within the Study Area. The nearest major town is Hay, which is located approximately 44 km northeast of the Project. Smaller localities within the vicinity of the Study Area include Booroorban which is located approximately 16 km east of the Project Area.

An existing 220kV transmission line runs east to west across the Study Area, along Booroorban-Tchelery Road on the southern boundary of the Project Area.

Image 06 Existing 220kV transmission line

Image 07 Agricultural channels



Key Landscape Features

Refer to Section 4.4

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Named Watercourse
- Roads
- Contours
- Watercourses and Dams

0 0.3 0.6 0.9 1.2 km

Figure 08 Key Landscape Features
Basemap Source - ESRI, 2024

4.7 Identify Landscape Character Zones

Landscape character zones should be defined based on shared visual characteristics, such as landforms and dominant land cover patterns. These patterns emerge from the interplay of vegetation, waterbodies, landforms, and land use, enabling the identification of key landscape features. **Figure 09** provides a schematic representation of what defines a Landscape Character Zone (LCZ).

The Study Area has been categorised into two LCZs; LCZ01 Agricultural Pastures & Rural Properties, and; LCZ02 Vegetated Hills. The general extent of these LCZs is shown in **Figure 10.**

The visual sensitivity of each LCZ has been assessed using the scenic quality frame of reference, from the DPHI's Large Scale Solar Guideline Technical Supplement.

4.8 Determining Scenic Quality

Scenic quality reflects the overall and relative scenic, cultural, or aesthetic value of the landscape within the viewshed. This assessment is based on the presence or absence of key landscape features that influence community perceptions of scenic quality, ranging from very low to high.

The baseline analysis and landscape character assessment have been used to inform the classification of scenic quality values. A scenic quality rating has been applied to each LCZ based on the Scenic Quality Frame of Reference and the visual reference for scenic quality values provided in the Technical Supplement (as presented in **Table 02** and **Table 03**).

The scenic quality has assisted in determining the sensitivity of each LCZ, results are shown in **Table 07**.

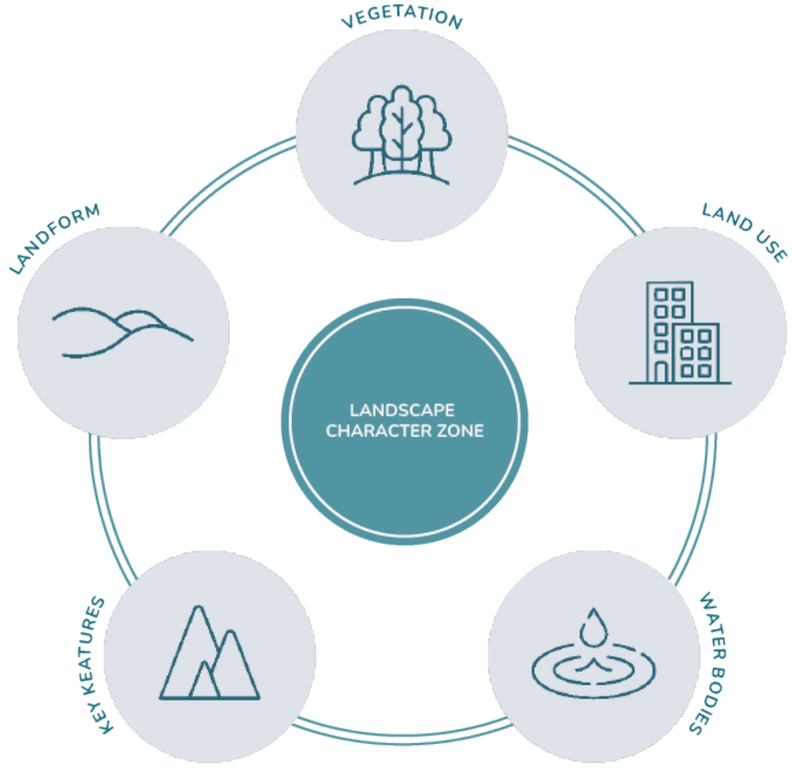
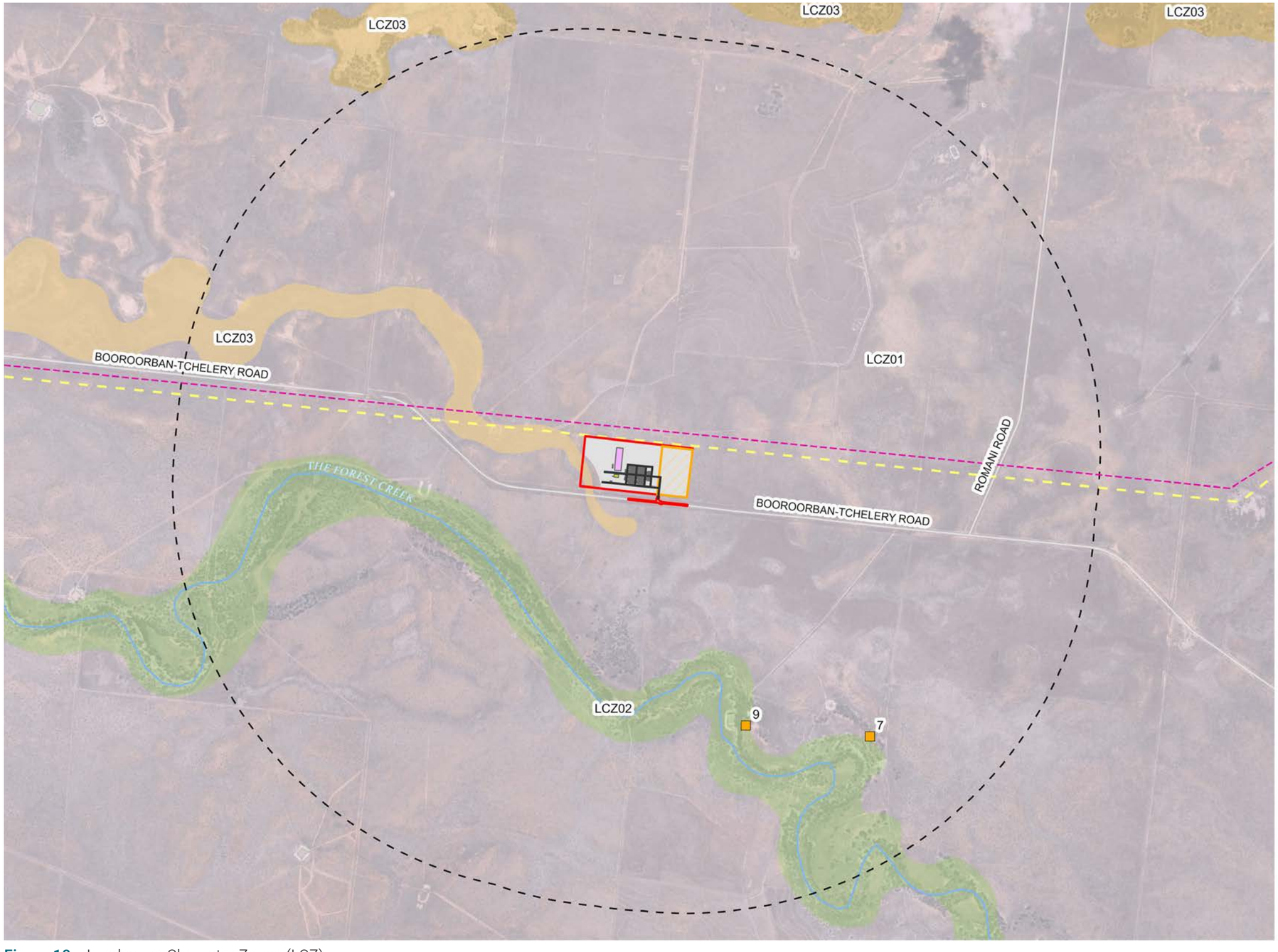


Figure 09 Defining Landscape Character Zones



Landscape Character Zones

Refer to Section 4.5

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Non-Associated Dwellings
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Roads
- Named Watercourse
- LCZ01
- LCZ02
- LCZ03

0 0.3 0.6 0.9 1.2 km

Figure 10 Landscape Character Zones (LCZ)
Basemap Source - ESRI, 2024

Scenic Quality Frame of Reference				
Feature	Very Low Scenic Quality	Low Scenic Quality	Moderate Scenic Quality	High Scenic Quality
Landform	• Large expanses of flat or gently undulating terrain • Indistinct, dissected or unbroken landforms that provide little illusion of spatial definition or landmarks with which to orient	• Mostly flat or gently undulating terrain with isolated areas of undulating topography	• Steep, hilly and undulating ranges that are not visually dominant • Broad shallow valleys • Moderately deep gorges or moderately steep valley walls • Minor rock outcrops	• Isolated peaks, steep rocky ridges, cones or escarpments with distinctive form and/or colour contrast that become focal points • Large areas of distinctive rock outcrops or boulders Well defined, steep sided valley gorges
Vegetation	• Extensively cleared and cropped areas with very limited variation in colour and texture • Pastoral areas, human created paddocks, pastures or grasslands and associated buildings typical of grazing lands	• Predominantly cleared and cropped areas with small areas of variation in colour and texture • Mostly pastures or grasslands with small blocks of distinct native vegetation	• Predominantly open forest or woodland combined with some natural openings in patterns that offer some visual relief • Vegetative stands that exhibit a range of size, form, colour, texture and spacing including human influenced vegetation such as vineyards, and orchards	• Strongly defined patterns with combinations of native forest, naturally appearing openings, streamside vegetation and/or scattered exotics • Distinctive stands of vegetation that may create unusual forms, colours or textures in comparison to surrounding vegetation
Waterform	• Absence of natural waterbody • Farm dams, irrigation canals or stormwater infrastructure	• Minor waterforms such as creeks and streams	• Intermittent streams, lakes, rivers, swamps and reservoirs	• Visually prominent lakes, reservoirs, rivers, streams, wetlands and swamps • Presence of harbour, inlet, bay or open ocean
Social & Cultural	• Places of worship, cemeteries/memorial parks, private open spaces	• Places of worship, cemeteries/memorial parks, private open spaces • Local heritage sites	• Local or state heritage sites • Distinguishable entry ways to a regional city identified in the Transport and Infrastructure SEPP	• Culturally important sites, world heritage areas, national parks/reserves, • World, national and state heritage sites
Human Presence	• Dominating presence of infrastructure, human settlements, highly modified landscapes and higher density populations such as regional cities, industrial areas, agricultural transport or electricity infrastructure	• Highly modified landscapes with visible infrastructure such as transmission lines and railway corridors	• Dispersed yet evident presence of human settlement such as villages, small towns, isolated pockets of production and industry, lower scale and trafficked transport infrastructure	• Natural/undisturbed landscape • Minimal evidence of human presence and production

Table 02 Scenic Quality Frame of Reference

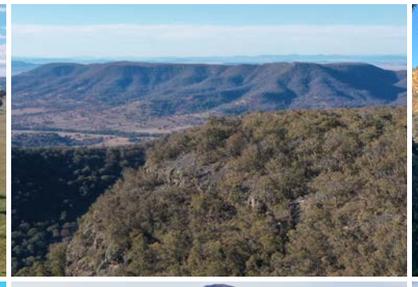
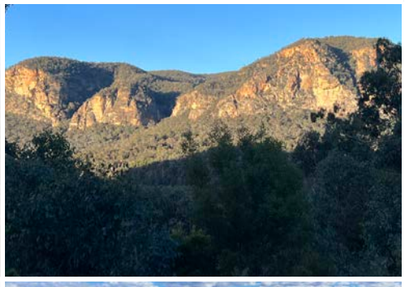
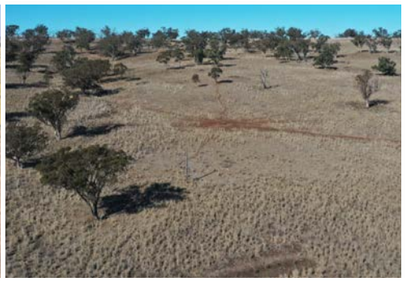
Visual Scenic Quality Frame of Reference				
Feature	Very Low Scenic Quality	Low Scenic Quality	Moderate Scenic Quality	High Scenic Quality
Landform				
Vegetation				
Waterforms				
Social & Cultural				
Human Presence				

Table 03 Visual Reference of Scenic Quality

4.9 Landscape Character Zones

A total of three (3) LCZs have been identified within the Study Area as part of the Landscape Character Assessment. The LCZs are outlined in **Figure 10**.

4.9.1 LCZ01 - Agricultural Plains

The landform within this LCZ is characterised by flat, expansive, generally treeless land that is primarily used for native grazing, with areas of modified pastures and cropping present. Vegetation within this LCZ is typical of the Murrumbidgee IBRA subregion, which has extensive plains of saltbush communities and native grasses.

The overall scenic quality of this LCZ is rated as **Very Low**.

Image 08 Expansive saltbush plains in LCZ01

Image 09 Saltbush & native grasses in LCZ01

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS		Application of Scenic Quality Rating Frame of Reference					SCENIC QUALITY RATING
				Landform	Waterform	Vegetation	Human Presence	Social & Cultural	
LCZ01 - Agricultural Plains	Expansive plains	Booroorban-Tchelery Road & Romani Road	H						VERY LOW
			M						
			L			■	■		
			VL	■	■	■	■	■	

Table 04 LCZ01 - Agricultural Plains

4.9.2 LCZ02 - Riparian Corridors

This LCZ is characterised by distinct riparian corridors. The vegetation within this LCZ is defined by black box and lignum communities that line the creeks and waterways in the Study Area. This vegetation condition is typical along ephemeral creeks throughout the bioregion. The vegetation corridors become a key feature of the region as they provide some of the only vertical landscape features on the horizon due to the expansive, flat terrain.

The overall scenic quality of this LCZ is rated as **Low**.

Image 10 Distinct riparian vegetation corridor that defines LCZ02

Image 11 Riparian corridor provides contrast within the plains

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS		Application of Scenic Quality Rating Frame of Reference					SCENIC QUALITY RATING
				Landform	Waterform	Vegetation	Human Presence	Social & Cultural	
LCZ02 - Riparian Corridors	Creek lines & riparian vegetation corridors	Booroorban-Tchelery Road & Romani Road	H						LOW
			M			■			
			L		■	■	■		
			VL	■	■	■	■	■	

Table 05 LCZ02 - Riparian Corridors

4.9.3 LCZ03 - Depressions & Vegetated Floodplains

The landform within this LCZ is defined by slight undulations and depressions that carry seasonal water in the region. Some of these areas are used for native grazing. Prominent vegetation within this LCZ includes saltbush varieties and native grasses, with some areas prone to higher water retention featuring black box and lignum communities.

The overall scenic quality of this LCZ is rated as **Very Low**.

Image 12 Isolated depressions with blackbox communities present

Image 13 Blackbox and lignum communities on floodplains

LANDSCAPE CHARACTER UNIT	KEY LANDSCAPE FEATURES (dominant features within this zone)	KEY VIEWPOINTS		Application of Scenic Quality Rating Frame of Reference					SCENIC QUALITY RATING
				Landform	Waterform	Vegetation	Human Presence	Social & Cultural	
LCZ03 - Depressions & Vegetated Floodplains	Depressions & blackbox vegetation	Booroorban-Tchelery Road & Romani Road							VERY LOW
			H						
			M						
			L			■	■		
			VL	■	■	■	■	■	

Table 06 LCZ03 - Depressions & Vegetated Floodplains

4.10 Landscape Character Assessment

The following provides an overview of determining the sensitivity of a LCZ and the magnitude of effect resulting from the Project. The overall level of landscape character impact on each LCZ has been rated as low, moderate or high.

4.10.1 Determine Magnitude Rating

The Technical Supplement states: "*Applicants should consider the following when analysing and rating the magnitude of the project:*

- *Size and scale including:*
- *the extent of landscape elements that may be lost and the contribution of those elements make to the landscape character;*
- *the extent to which the project becomes a minor or major element in the landscape and its dominance in the visual catchment; and*
- *the extent to which the project changes the key characteristics of the landscape that are critical to its distinctive character (including the removal of vegetation)*
- *Geographical area – the area of the landscape that will experience the project's effects. This could vary from the immediate site setting to a larger scale, where the project may influence several landscape character zones"* (DPHI, 2024b)

4.10.2 Determine Sensitivity

The Technical Supplement states: "*Visual sensitivity refers to the quality of the view and how sensitive it is to the proposed change... Applicants should rate the sensitivity of the landscape character type based on the inherent capability of the area to absorb changes from the project"* (DPHI, 2024b).

4.10.3 Determine Impact on LCZ

The overall level of landscape character impact has been determined through the combination of landscape sensitivity and visual magnitude. Results from the Landscape Character Assessment are shown in **Table 07.**

Landscape Character Assessment					
LCZ:	**Name:**	**Scenic Quality Rating:**	**Sensitivity:**	**Magnitude:**	**Landscape Character Impact Rating:**
LCZ01	**Agricultural Plains**	**VERY LOW**	**VERY LOW** Some human modification is present within this LCZ. Remnant native vegetation is present and used for grazing. The landscape character of this LCZ would remain unchanged as a result of the Project.	**LOW** Due to the lack of intervening vegetation and flat terrain, views toward the Project would be available from most areas within this LCZ. However, due to the isolated nature of the Project Area, the potential to view the Project is limited to the low-use roads (Booroorban-Tchelery Road and Romani Road) that pass through the Study Area. The Project is located within this LCZ, but it is not expected to compete with the key landscape features, including the flat terrain and saltbush plains. Existing electrical infrastructure is also present within this LCZ; therefore, the Project's presence would not adversely change its landscape character.	**VERY LOW**
LCZ02	**Riparian Corridors**	**LOW**	**LOW** This LCZ consists of The Forest Creek and other minor unnamed ephemeral creeks. Vegetation along these watercourses includes established blackbox and lignum communities. Some areas within the LCZ have been used for rural residential dwellings. The landscape character of this LCZ would remain unchanged as a result of the Project.	**VERY LOW** The Project is not located within this LCZ. Due to the dense vegetation surrounding the LCZ, views toward the Project are likely to be fragmented or screened. Where views are available, they are likely to occupy a small proportion of the view.	**VERY LOW**
LCZ03	**Depressions & Vegetated Floodplains**	**VERY LOW**	**VERY LOW** This LCZ consists of shallow depressions and floodplains that act as a refuge for seasonal water flows. Vegetation ranges from native grasses and saltbush, which are typically used for grazing, to more established blackbox and lignum communities, where water retention is higher. The landscape character of this LCZ would remain unchanged as a result of the Project.	**LOW** The Development Footprint is located outside of this LCZ. Areas within this LCZ featuring low-lying native grasses and saltbush would have views toward the Project. However, the extent of change is considered low due to the existing electrical infrastructure present in the viewshed. Areas within this LCZ that feature denser vegetation would have fragmented or screened views toward the Project. The landscape character of the LCZ would be unaltered as a result of the Project.	**VERY LOW**

Table 07 Overview of Landscape Character Assessment

05 Visual Impact Assessment

5.0 Visual Impact Assessment

4.11 Visual Impact Assessment Methodology

A Visual Impact Assessment evaluates the everyday visual effects of a project on both private and public views. Assessing the potential impacts of a project requires an understanding of an area's or viewpoint's sensitivity to change, as well as the scale and magnitude of the proposed project. The Visual Impact Assessment process should be proportionate to the anticipated impacts of the project.

4.11.1 Determining Visual Sensitivity

Visual Sensitivity refers to the quality of the existing view and how sensitive the view is to the proposed change. The visual sensitivity is determined through the following three steps:

Step 1. *Determine Viewpoint Sensitivity*

Step 2. *Determine Scenic Quality*

Step 3. *Calculate Overall Visual Sensitivity*

4.11.2 Viewpoint Sensitivity

Viewpoint sensitivity relates to the relative importance of viewpoints and the value that the community or visitors may place on landscapes viewed from public use areas and public travelways and non-associated residences such as dwellings. The sensitivity of each viewpoint has been assigned as one of four (4) sensitivity ratings (very low, low, moderate, high) considering the examples in **Table 08**.

4.11.3 Scenic Quality

Scenic quality refers to the relative scenic, cultural or aesthetic value of the landscape within the viewshed based on the presence or absence of key landscape features known to be associated with community perceptions of very low, low, moderate, or high scenic quality. It is typically a complex process undertaken by experts in visual impact assessment and considers community values. The methodology for determining scenic quality is outlined in **Section 4.8**.

4.11.4 Overall Visual Sensitivity

Once the viewpoint sensitivity and scenic quality are determined, these can be combined using the visual sensitivity matrix in **Table 09** to determine the overall visual sensitivity of each identified viewpoint.

Viewpoint Type	Very Low sensitivity	Low sensitivity	Moderate sensitivity	High sensitivity
Private receptor	Private recreation areas and sporting fields (land zoned RE2)	Secondary dwelling view from dwelling rural area (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential (zoned R5) and environmental and conservation zones	Primary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and environmental or conservation areas (zoned C2, C3 and C4) Tourist and visitor accommodation (bedand-breakfasts, motels and hotels) and places of worship	Dwellings in residential and rural villages (zoned R1, R2, R3, R4 and RU5) Historic rural homesteads/ residences on the national, state or local heritage list
Public viewpoint	State highways, freeways and classified main roads Local sealed and unsealed roads	Cemeteries, memorial parks Tourist roads and scenic drives. Significant entry ways to regional towns and cities. Walking tracks and navigable waterways	Tourist uses in tourist areas (zoned SP3) Publicly accessible green and open spaces, including picnic areas, parks, public recreation areas and lookouts Town centres and central business districts	n/a

Table 08 Viewpoint Sensitivity Levels and Examples

VISUAL SENSITIVITY MATRIX				
Viewpoint Sensitivity Level	*High Scenic Quality*	*Moderate Scenic Quality*	*Low Scenic Quality*	*Very Low Scenic Quality*
HIGH	HIGH	HIGH	MODERATE	LOW
MODERATE	HIGH	MODERATE	MODERATE	LOW
LOW	MODERATE	LOW	LOW	VERY LOW
VERY LOW	VERY LOW	VERY LOW	VERY LOW	VERY LOW

Table 09 Visual Sensitivity Matrix

5.11.1 Determining Visual Magnitude

Visual magnitude refers to the extent of change that would be experienced by receptors. Factors that are considered when assessing the magnitude of change include: (AILA, 2018):

- The proportion of the view / landscape effected;
- Extent of the area over which the change occurs;
- The size and scale of the change;
- The rate and duration of the change; and
- The level of contrast and compatibility.

The visual magnitude is assigned one of four (4) magnitude ratings (very low, low, moderate, high).

5.11.2 Determining Overall Visual Impact

Once visual magnitude and visual sensitivity have been established for each viewpoint, the overall visual impact is determined by combining the magnitude and sensitivity ratings according to the matrix in **Table 10**.

Viewpoints with very low or low visual impact do not require mitigation. Viewpoints that have a moderate or high visual impact would require mitigation to reduce the visual impacts associated with the Project.

		VISUAL SENSITIVITY RATING			
		HIGH	*MODERATE*	*LOW*	*VERY LOW*
MAGNITUDE RATING	*VERY HIGH*	HIGH	HIGH	MODERATE	MODERATE
	HIGH	HIGH	MODERATE	MODERATE	LOW
	MODERATE	MODERATE	MODERATE	LOW	LOW
	LOW	MODERATE	LOW	LOW	VERY LOW
	VERY LOW	LOW	LOW	VERY LOW	VERY LOW

Table 10 Visual Impact Matrix

5.1 Zone of Visual Influence

An initial visibility assessment was undertaken utilising Zone of Visual Influence (ZVI) mapping. This tool assists in defining the 'Visual Catchment' for the Project.

The ZVI represents the area over which a development can theoretically be seen, and is based on a Digital Terrain Model (DTM). The ZVI is a desktop tool intended to make the fieldwork and assessment more efficient by clearly excluding areas that are screened by topography. Fieldwork assessments are then undertaken predominantly within the areas with the potential for visual impacts.

The ZVI presents a bare ground scenario - ie. A landscape without screening, structures or vegetation, and is usually presented on a base map. It is also referred to as a zone of theoretical visibility (LIIEMA, 2002). As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note the ZVI is based solely on topographic information. This form of mapping is acknowledged as providing a worst case scenario and is used purely as a desktop assessment tool to determine areas for further investigation.

5.1.1 Zone of Visual Influence Summary

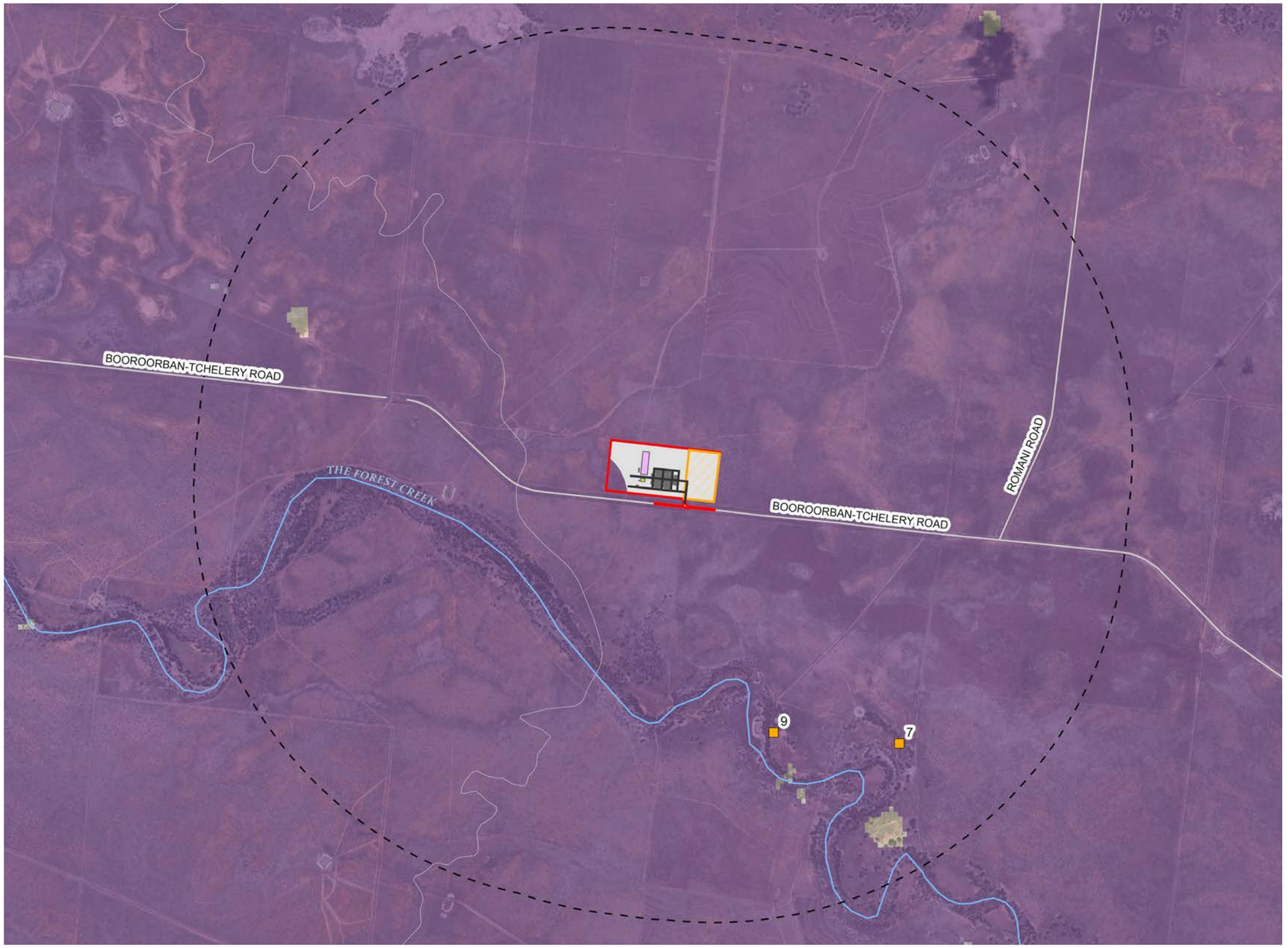
The ZVI for the Project has been prepared based on a the maximum height of the BESS modules at 3 m, the O&M facility at 5 m and the transformer at 6 m. The viewshed map is shown in **Figure 11**.

Summary of findings of the viewshed analysis:

- The majority of the Study has high theoretical visibility of the Project due to the flat topography.

The ZVI has been used to identify areas of potential high visibility, which informs the on-site fieldwork and viewpoint analysis to identify locations that require further detailed analysis.

It is noted that the ZVI analysis provides a worst-case scenario as existing screening elements such as structures or vegetation are not considered in the ZVI mapping. Further assessment and fieldwork is required to determine whether existing screening elements in the landscape are able to reduce visual impacts to an acceptable level, or if further mitigation strategies are required.



Viewshed Mapping

Refer to Section 5.1

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Non-Associated Dwellings
- Named Watercourse
- Contours

ZVI LEGEND

- 100% Visibilty
- No Visibility

NOTE

Viewshed Map is a preliminary assessment tool representing a bare-ground scenario—i.e., a landscape without screening, structures, or vegetation. As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note that the map is based solely on topographic information. Therefore, this form of mapping should be acknowledged as representing the worst-case scenario.

0 0.3 0.6 0.9 1.2 km

Figure 11 Viewshed Mapping
Basemap Source - ESRI, 2024

5.2 Assessment Methodology for Public Viewpoints

The viewpoint analysis considers the likely visual impacts of the Project on the existing landscape character and visual amenity by selecting prominent sites, otherwise referred to as viewpoints.

Once the viewpoints were selected, panoramic photographs were taken on a level tripod at a height of 150cm (to represent eye level). Photographs were taken with a Fujifilm GFX 100s Medium Format camera with a 63mm fixed focal lens (the equivalent full frame 50mm lens) which closely represents the central field of vision of the human eye.

The visual impact of the viewpoint are then assessed both on site and with the topographic and aerial information to ensure accuracy. For each viewpoint, the potential visual impacts are analysed through a combination of the 3D terrain modelling, topographic maps and on site analysis. Viewpoint photographs and analysis have been included in the following pages. The findings of the viewpoint analysis have been quantified and are summarised in **Table 11**.

5.3 Viewpoint Selection

The selection of public viewpoints has been informed by topographical maps, fieldwork observations and other relevant influences such as access, landscape character and the popularity and sensitivity of vantage points. Viewpoints are selected to illustrate the following:

- Areas of high scenic value, or community value
- Views from public areas such as camp grounds, rest stops, lookouts, parks, community halls etc.
- Views from public roads
- Range of distances from the Project
- Range of elevations in relation to the Project
- Range of extent of visibility of the Project

A total of four (4) viewpoints were selected from publicly accessible locations to represent a range of views surrounding the Project Area, noting that there limited opportunities to view the Project within the local region with the exception of Booroorban-Tchelery Road and Romani Road. Locations of the viewpoints are outlined in **Figure 15**.

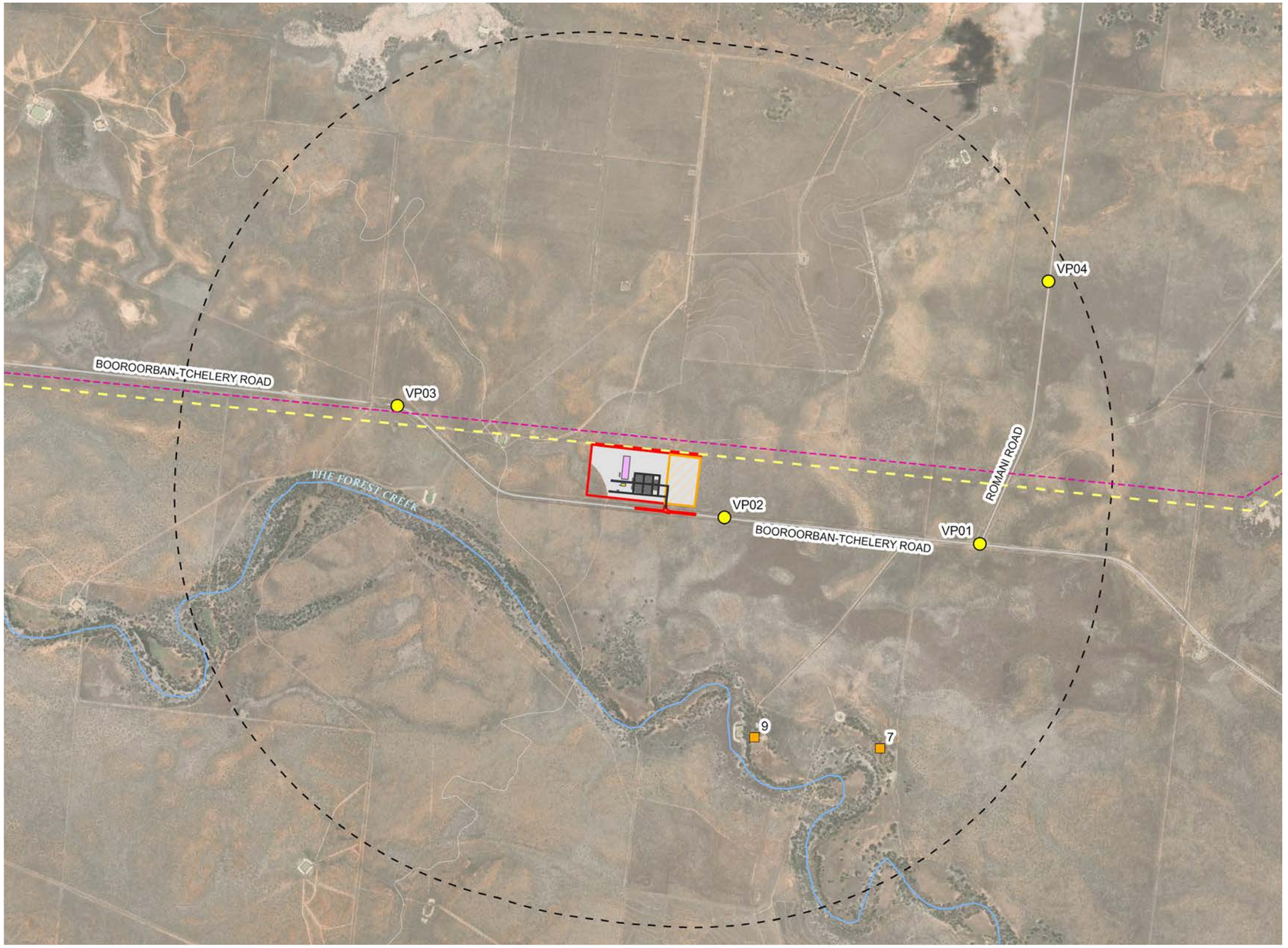
5.4 Summary of Visual Impacts from Public Viewpoints

The Project would result in a Low to Very Low visual impact on the existing landscape character. Due to the flat topography and small vertical scale of the Project, the visual impact of the Project is very low with the exception of a small section of Booroorban-Tchelery Road immediately adjacent to the Project.

The results from the visual impact assessment for public viewpoints are summarised in **Table 11**.

Viewpoint	Location	Visual Sensitivity	Visual Magnitude	Visual Impact
VP01	Booroorban-Tchelery Road	Very Low	Very Low	*Very Low*
VP02	Booroorban-Tchelery Road	Very Low	Moderate	*Low*
VP03	Booroorban-Tchelery Road	Very Low	Very Low	*Very Low*
VP04	Romani Road	Very Low	Very Low	*Very Low*

Table 11 Viewpoint Assessment Results



Viewpoint Locations

Refer to Section 5.3

LEGEND

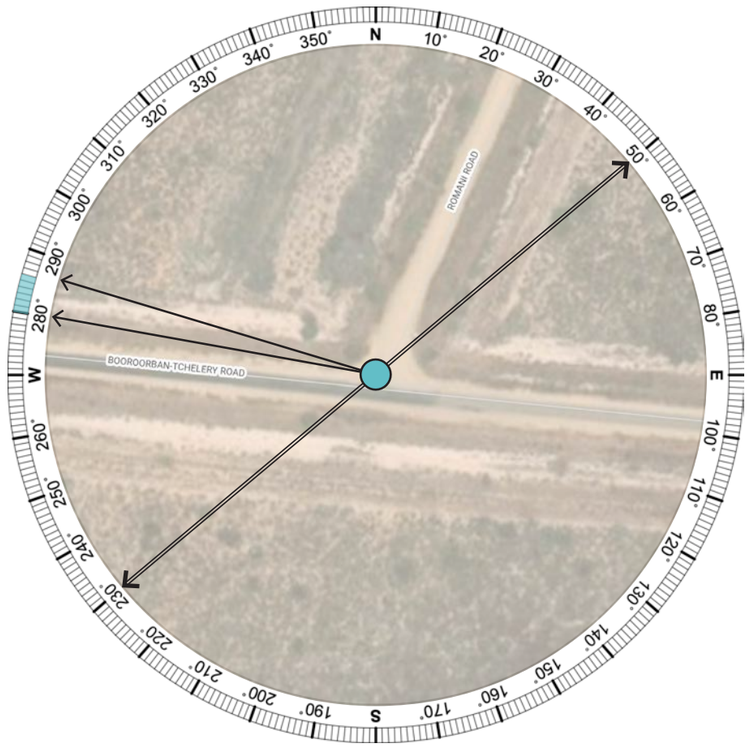
- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Viewpoint Locations
- Non-Associated Dwellings
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Roads
- Named Watercourse
- Contours

0 0.3 0.6 0.9 1.2 km

Figure 12 Viewpoint Locations
Basemap Source - ESRI, 2024

Viewpoint:
VP01 Booroorban-Tchelery Road, Booroorban

Extent of Potential Visibility



Viewpoint Summary:	
Location:	Elevation:
Booroorban-Tchelery Road	79 m
Coordinates:	Distance to Project:
34°53'43.41"S 144°35'42.23"E	1.91km
Viewing Direction:	
Northwest	
Visual Sensitivity:	
Very Low	
Visual Magnitude:	
Low	
Visual Impact:	
Very Low	

Extent of Panorama

Approximate Extent of Project

Aerial Source: Google Earth, 2023

Existing Landscape Character Description:

This viewpoint is located at the junction of Booroorban-Tchelery Road and Romani Road. The viewpoint is looking west toward the Project.
The surrounding landscape is characterized by flat saltbush plains, with a 330kV transmission line visible in the midground and distant trees visible in the background.

The sensitivity of the viewpoint has been rated as **Very Low**.

Potential Visual Impact:

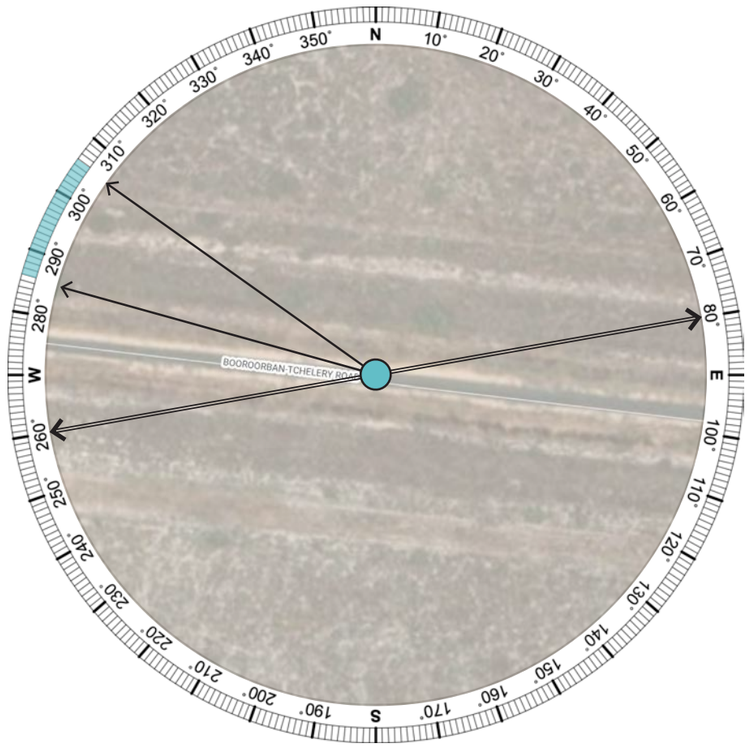
The Project would be visible from most of the Study Area due to the lack of vegetation and the flat topography. However, from this distance, the Project would occupy less than 0.5 degrees of the vertical field of view. Therefore, the Project is visually hard to discern at this distance, resulting in a **Very Low** visual magnitude.

The Project has a **Very Low** visual impact from this location.

VP Location

Viewpoint:
VP02 Booroorban-Tchelery Road, Booroorban

Extent of Potential Visibility



Viewpoint Summary:	
Location:	Elevation:
Booroorban-Tchelery Road	79 m
Coordinates:	Distance to Project:
34°53'37.03"S 144°34'41.39"E	0.38 km
Viewing Direction:	
North	
Visual Sensitivity:	
Very Low	
Visual Magnitude:	
Moderate	
Visual Impact:	
Low	

Extent of Panorama

Approximate Extent of Project

Aerial Source: Google Earth, 2023

Existing Landscape Character Description:

This viewpoint is located on Booroorban-Tchelery Road, looking northwest toward the Project.
The surrounding landscape is characterized by flat saltbush plains, with a 330kV transmission line visible in the midground.

The sensitivity of the viewpoint has been rated as **Very Low**.

Potential Visual Impact:

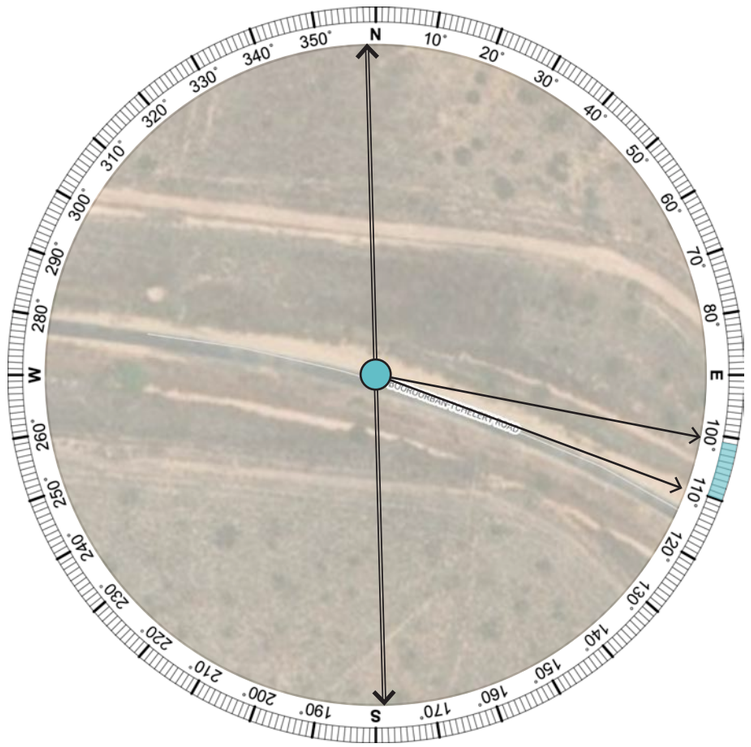
The Project would be visible from most of the Study Area due to the lack of vegetation and the flat topography. From this distance, the Project would occupy approximately 1 degree of the vertical field of view. Therefore, the Project would be visible from this distance however would be a small element in the view. Due to the flat terrain, lack of vegetation or buildings, the Project does contribute to a **Moderate** magnitude of change when in close proximity to the Project.

The **Moderate** magnitude combined with the **Very Low** visual sensitivity, results in a **Low** visual impact overall.

VP Location

Viewpoint:
VP03 Booroorban-Tchelery Road, Booroorban

Extent of Potential Visibility



Viewpoint Summary:	
Location:	Elevation:
Booroorban-Tchelery Road	80 m
Coordinates:	Distance to Project:
34°53'13.60"S 144°33'23.96"E	1.38 km
Viewing Direction:	
East	
Visual Sensitivity:	
Very Low	
Visual Magnitude:	
Low	
Visual Impact:	
Very Low	

Extent of Panorama

Approximate Extent of Project

Aerial Source: Google Earth, 2023

Existing Landscape Character Description:

This viewpoint is located on Booroorban-Tchelery Road looking east toward the Project.
The surrounding landscape is characterized by flat saltbush plains, with a 330kV transmission line visible in the midground and trees associated with The Forest Creek visible in the background.

The sensitivity of the viewpoint has been rated as **Very Low**.

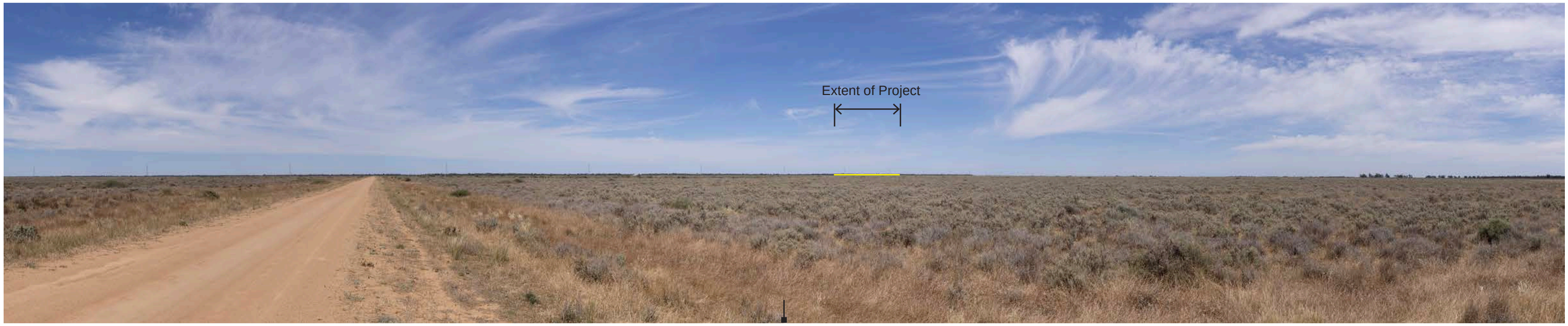
Potential Visual Impact:

The Project would be visible from most of the Study Area due to the lack of vegetation and the flat topography. However, from this distance, the Project would occupy less than 0.5 degrees of the vertical field of view. Therefore, the Project is visually hard to discern at this distance, resulting in a **Very Low** visual magnitude.

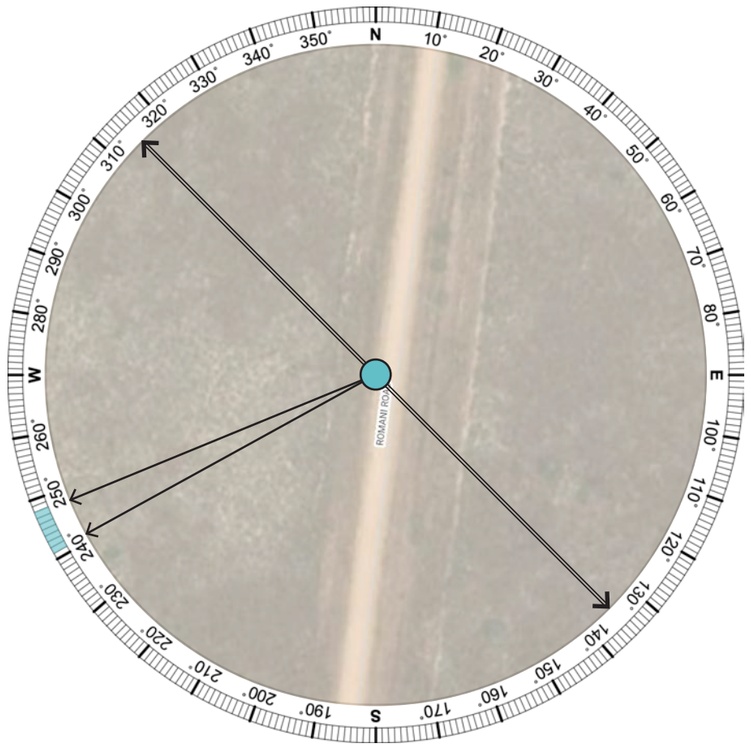
The Project has a **Very Low** visual impact from this location.

VP Location

Viewpoint:
VP04 Romani Road, Booroorban



Extent of Potential Visibility



Viewpoint Summary:	
Location:	Elevation:
Romani Road	80 m
Coordinates:	Distance to Project:
34°52'52.23"S 144°36'0.10"E	2.50 km
Viewing Direction:	
Southwest	
Visual Sensitivity:	
Very Low	
Visual Magnitude:	
Very Low	
Visual Impact:	
Very Low	

Extent of Panorama

Approximate Extent of Project

Aerial Source: Google Earth, 2023

Existing Landscape Character Description:

This viewpoint is located on Romani Road looking southwest toward the Project.
The surrounding landscape is characterized by flat saltbush plains, with a 330kV transmission line visible and trees visible in the distance.

The sensitivity of the viewpoint has been rated as **Very Low**.

Potential Visual Impact:

The Project would be visible from most of the Study Area due to the lack of vegetation and the flat topography. However, from this distance, the Project would occupy less than 0.5 degrees of the vertical field of view. Therefore, the Project is visually hard to discern at this distance, resulting in a **Very Low** visual magnitude.

The Project has a **Very Low** visual impact from this location.

VP Location

5.5 Photomontages

A photomontage is a visualisation based on the superimposition of the Project onto a viewpoint photograph for the purpose of creating a realistic representation of proposed or potential changes to a view (Horner, 2006). Photomontages have been utilised in this LCVIA report to assist in the visual impact assessment of the Project.

5.5.1 Photomontage Development Process

The process for generating these images involves computer generation of a wireframe perspective view of the Project. This process includes:

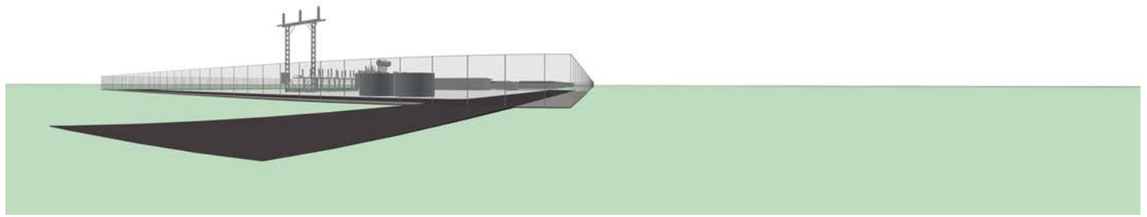
- Capturing viewpoints with a Fujifilm GFX 100s Medium Format camera with a 63mm fixed focal lens (the equivalent full frame 50mm lens);
- Building a wireframe model of the Project;
- Matching the wireframe model to the viewpoint using rendering software; and
- Rendering the model into viewpoint to a realistic level.

These photomontages are based on photography from key public viewpoints that are included within **Section 5.4**. It is noted that a 50mm fixed focal lens closely represents the central field of vision of the human eye. The process for photomontage development is demonstrated in **Figure 13**.

5.6 Photomontage Viewpoint Selection

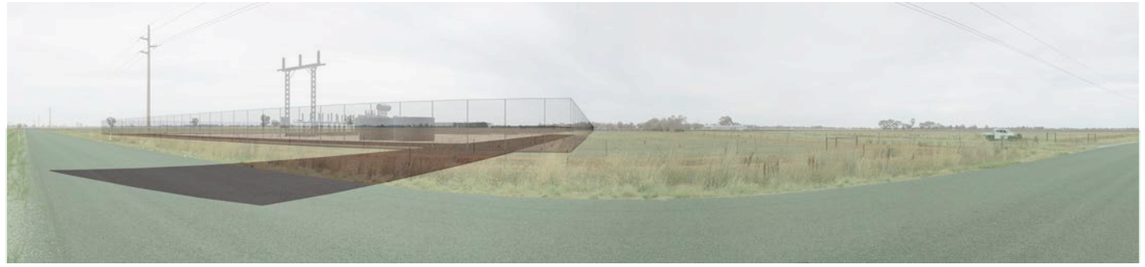
One (1) photomontage of the Project from VP02 was selected as a key view and represent general visibility of the Project (refer to **Figure 14**). Viewpoints selected for the preparation of photomontages are generally those determined to have the greatest potential for visual magnitude change and overall visual impact. For this report, the viewpoint selected is the closest to the Project and aims to represent the general approach to the Project along Booroorban-Tchelery Road.

Step 1: Develop 3D Model



Detailed 3D model of the Site is developed in a modelling software. The Project is modelled and sited in the 3D model to scale

Step 2: Align Photograph and Model

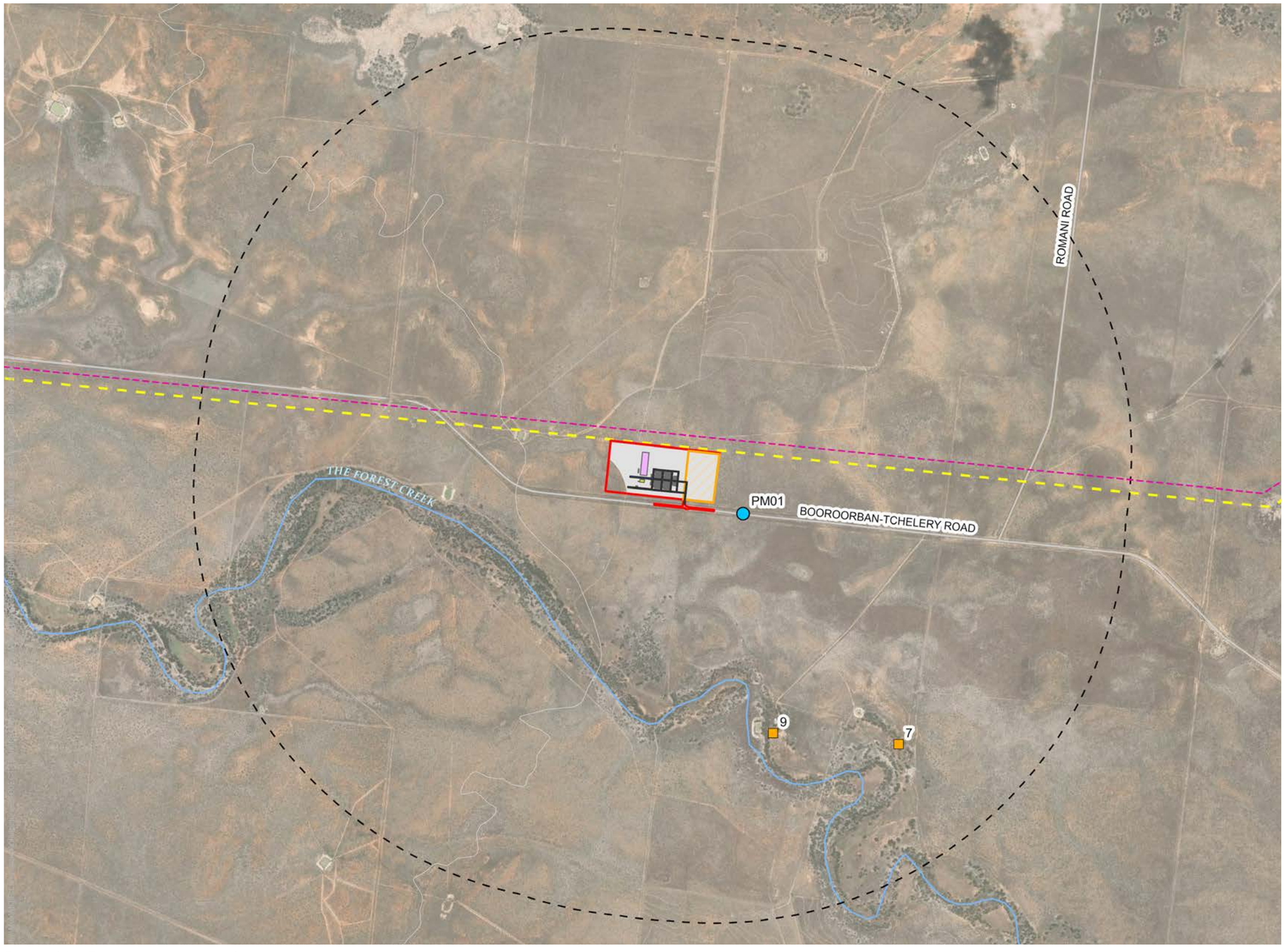


The digital panorama is imported into the modelling software. Topography, control points, obstacle objects that can be used as reference to calibrate the model camera very precisely.

Step 3: Render Photomontage

The software calculates the position of the sun based on the time and date of photograph and renders the Project in accordance with the specific weather conditions and position of the sun. Once rendered, detailed removal of intervening elements (such as vegetation) is undertaken to provide an accurate representation of the Project.

Figure 13 Photomontage Development Process



Photomontage Locations

Refer to Section 5.6

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Photomontage Locations
- Non-Associated Dwellings
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Named Watercourse
- Contours

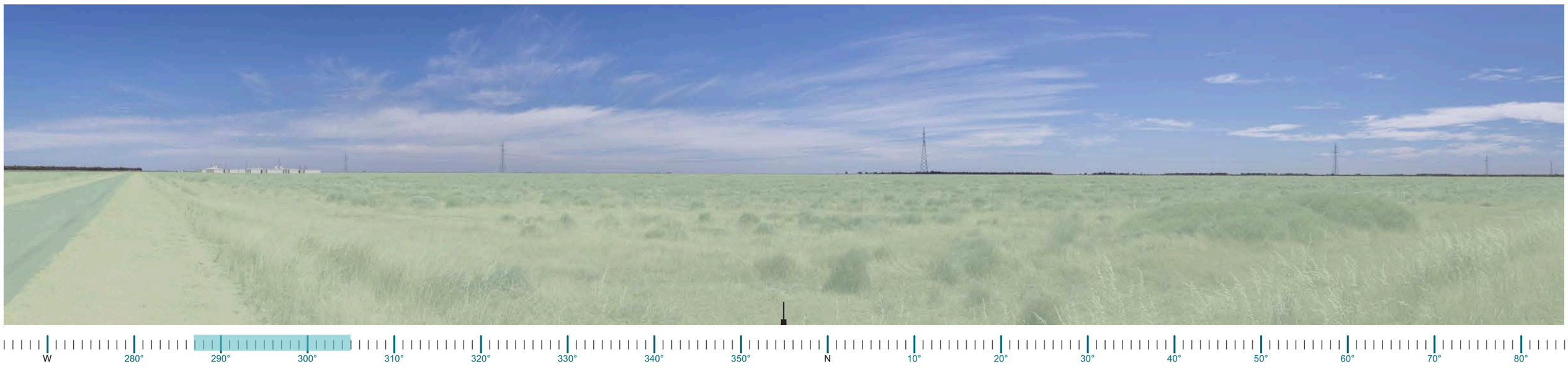
0 0.3 0.6 0.9 1.2 km

Figure 14 Photomontage Locations
Basemap Source - ESRI, 2024

Photomontage:

PM01 Booroorban-Tchelery Road

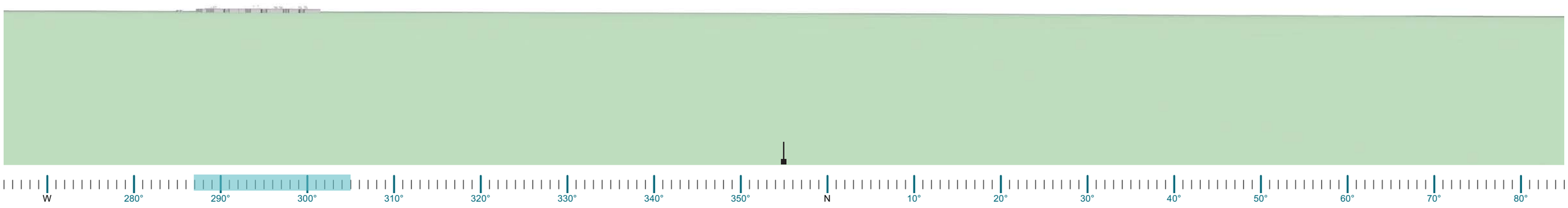
180° Existing View



180° Proposed Overlay

Photomontage:

PM01 Booroorban-Tchelery Road



180° Wireframe Diagram

180° Proposed View

5.7 Assessment of Associated Infrastructure

In addition to the proposed BESS, the associated infrastructure has the potential to contrast with the existing visual landscape. Due to a relatively low scale and siting of the Project, access roads, transmission lines and other ancillary infrastructure are unlikely to alter the existing visual landscape outside of the immediate vicinity.

An overview of the potential visual impact resulting from associated infrastructure and Project components is provided below. A summary of the proposed infrastructure associated with the Project can be found in **Section 3.2**. As outlined in the EIS, the ancillary infrastructure located within the Project Area includes the following items:

- On-site substation & associated switchgear
- Electrical reticulation connecting the substation and existing X5 transmission line
- 220kV power transformer (approximately 6m high)
- Temporary construction compound & laydown areas
- Control building (approximately 5m high)

5.7.1 Switchyard, Substation, Control Building

The proposed power transformer and control building are proposed to be taller than the proposed BESS units. This could lead to further visual impacts, however the area occupied by these taller elements is relatively small in comparison to the BESS area. The proposed transformer and control building are located behind the BESS units and are setback from Booroorban-Tchelery Road.

Booroorban-Tchelery Road is an unsealed, low-use road with a low receptor sensitivity and lies within a low scenic quality area. Therefore, the presence of the substation, transformer and control building would not be detrimental to the existing landscape character, where existing energy infrastructure is already present.

Therefore, the overall visual impact would be low.

5.7.2 Electrical Reticulation

The Project proposes an internal transmission line to connect the on-site substation and the existing High-Voltage transmission line. The transmission line design would be refined in the detailed design stage of the Project. Due to the presence of the existing transmission line and the area's low visual sensitivity, it is unlikely that the proposed transmission line would alter the existing landscape character within the Study Area.

The overall visual impact would be low.

5.7.3 Temporary Construction Compound & Laydown Areas

The temporary construction compound and laydown area are located on the southern and eastern boundary of the Project Area adjacent to Booroorban-Tchelery Road, and would be visible from this road receptor due to the lack of intervening screening elements. Due to the low vertical scale of the construction elements, the visual impact would only be moderate when in close proximity to the Project, and the impacts are temporary.

Therefore the overall visual impact would be low.

5.8 Design Considerations

Good design principles employed through the Project design phase can significantly reduce the visual impacts of the Project and associated infrastructure. These include siting principles, access, layout and other aspects of the design which directly influence the appearance of the proposed development.

The following outlines the design considerations that have been developed in response to the associated infrastructure:

- Existing vegetation generally present around the Project Area would be retained and protected to maintain the existing level of screening and to reduce the overall visual impact.
- Incorporate setbacks to infrastructure to allow for on-site screening where required in the form of perimeter planting.
- Consideration of the height of ancillary structures to ensure the Project does not contrast significantly with the surrounding landscape.
- The colours of the ancillary infrastructure would be considered in the detailed design phase to ensure minimal contrast and to help blend into the surrounding landscape to the extent practicable.

5.9 Assessment Methodology for Private Viewpoints

Moir Studio have developed a framework for defining and rating the level of visual impact from each private receptor (i.e. non-associated dwellings).

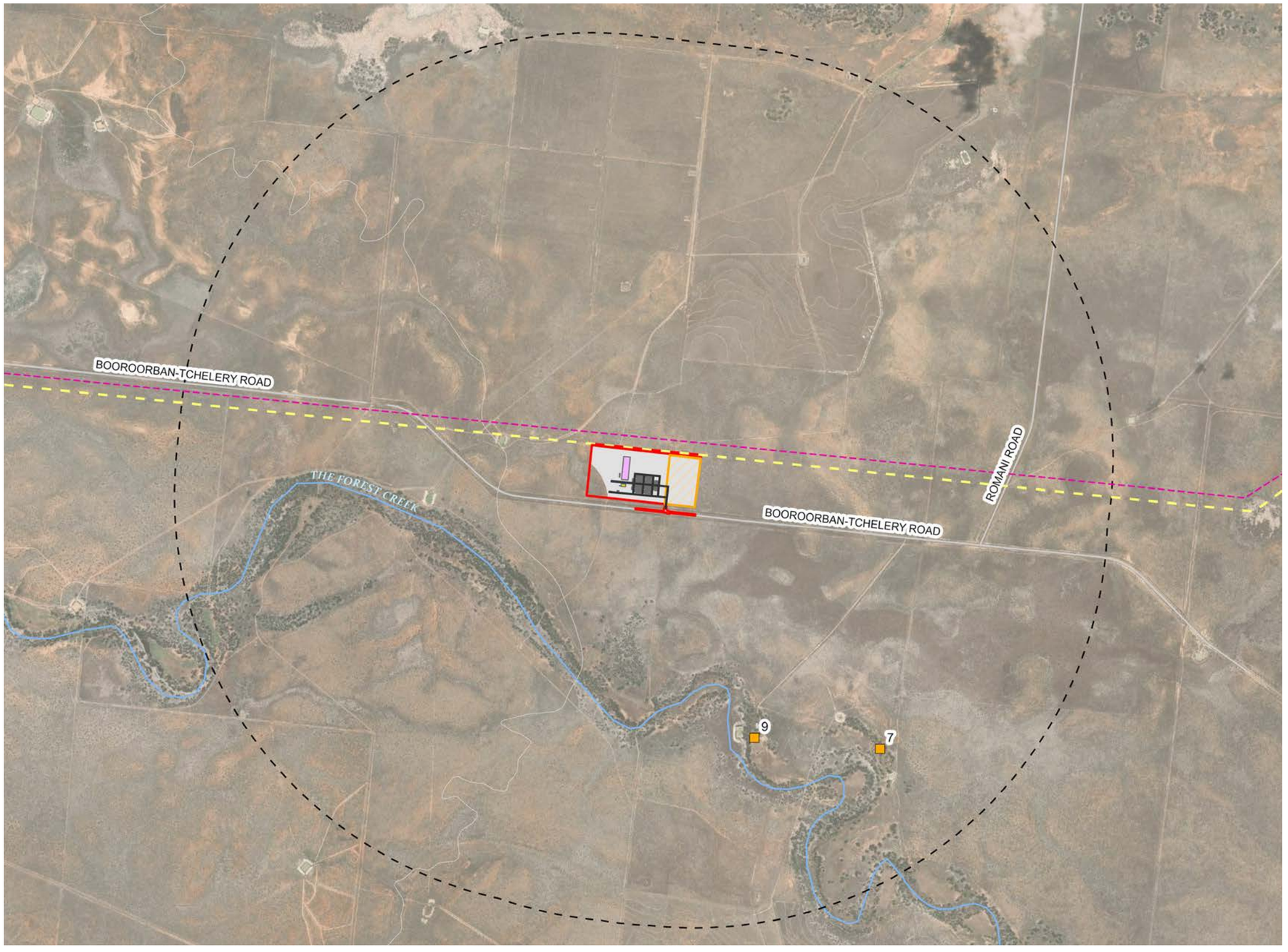
The framework in **Table 12** has been prepared with regards to the third edition of the Guidelines for Landscape and Visual Impact Assessment (GLVIA3), Residential Visual Amenity Assessment (RVAA) and Moir Studio's extensive professional experience in undertaking LVIA's. Published in 2013, the GLVIA3 is well established as providing 'best practice guidance' when undertaking Landscape Character and Visual Impact Assessment (LCVIA). RVAA is a stage beyond LVIA and focuses exclusively on private views and private visual amenity. Considerations outlined in the RVAA provide a framework for describing and evaluating the predicted magnitude of visual change and related visual amenity effects, which includes:

- *Distance of property from the proposed development having regard to its size / scale and location relative to the property (e.g. on higher or lower ground);*
- *Type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be affected, having regard to seasonal and diurnal variations;*
- *Direction of view / aspect of property affected, having regard to both the main / primary and peripheral/secondary views from the property;*
- *Extent to which development / landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;*
- *Scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;*
- *Degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;*
- *Duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc.; and*
- *Mitigation opportunities – consider implications of both embedded and potential further mitigation.*

Two (2) private receptors were identified within 2.5 km of the Project with a theoretical line of sight to the Project, as identified in **Section 5.1**. These private viewpoint locations are shown in **Figure 12.**

Private Viewpoint Magnitude Rating				
	VERY LOW	*LOW* ←	*MODERATE*	*HIGH*
Distance	The Project would not be visible.	The Project may be visible in distance or very partially visible in the foreground.	The Project maybe visible in the middle ground or a small extent may be visible in the near ground.	The Project would be highly visible in the foreground.
Type of views		Views from the receiver are not focused on the Project.	Views from the receiver are not focused entirely on the Project.	Views are focused directly towards the Project.
Direction of view		The Project may be visible in peripheral views or form a very minor element in primary views.	The Project may be visible from, yet would not dominate primary views.	The Project would be highly visible and has the potential to be a dominant element in primary views from the property.
Extent of visibility		The Project may be partially visible or fragmented.	The Project may be visible from the receiver yet would not significantly alter the existing visual character.	The Project has the potential to significantly alter the existing visual character when viewed from the receiver.
Scale of change		The Project may be visible yet would not change to the existing visual character.	The Project has the potential to become a noticeable element in the view, yet would not overly diminish the existing visual character.	The Project has the potential to alter the existing visual character.
Degree of contrast		The Project would have a low level of contrast with the existing landscape.	The Project would result in a moderate level of contrast with the existing landscape.	The scale of the Project would result in a high level of contrast with the existing landscape.
Duration of change		Changes are temporary.	Changes to the landscape have the potential to be reduced over time (with the employment of mitigation methods).	Changes to the landscape are continuous and / or irreversible.
Mitigation Options		Existing screening factors contribute to reducing the potential visibility.	Some existing screening factors may contribute to fragmenting the Project or there is opportunity to screen the Project.	Limited opportunities to screen the Project.

Table 12 Non-Associated Dwelling Visual Impact Assessment



Private Viewpoint Locations

Refer to Section 5.9

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- Development Footprint
- Construction Compound
- Non-Associated Dwellings
- PEC Transmission Line Route 330kV
- Exisiting 220kV Transmission Line
- Roads
- Named Watercourse
- Contours

0 0.3 0.6 0.9 1.2 km

Figure 15 Private Viewpoint Locations
Basemap Source - ESRI, 2024

5.10 Summary of Visual Impacts from Private Viewpoints

The Project would result in a Very Low visual impact on the surrounding dwellings. Due to the vegetation and ancillary buildings, there are minimal opportunities to view the Project from private viewpoints surrounding the Project.

The results from the visual impact assessment for private viewpoints are summarised in **Table 13**.

Receptor Number	Location	Visual Sensitivity	Visual Magnitude	Visual Impact
7	931 Booroorban-Tchelery Road, Booroorban	Moderate	Very Low	*Very Low*
9	931 Booroorban-Tchelery Road, Booroorban	Moderate	Very Low	*Very Low*

Table 13 Private Viewpoint Assessment Results

DWELLING ASSESSMENT TABLE (non-associated dwellings within 2.5 kilometres of the Project)																
I.D	*ADDRESS*	*ELEVATION*	*DISTANCE TO PROJECT*	*VISUAL ASSESSMENT*		*Receptor Visual Impact Rating*								*VISUAL IMPACT RATING* (without mitigation)	*MITIGATION MEASURES*	*VISUAL IMPACT RATING* (with mitigation)
						Distance	Views	Direction	Visibility	Scale	Contrast	Duration	Mitigation			
7	931 Booroorban-Tchelery Road, Booroorban	80 m	1.59 km	Receptor is located approximately 1.59 km southeast of the Project. The receptor is oriented north-south, with views towards the north. A site visit indicated that vegetation surrounds the receptor, fragmenting views toward the Project. Due to the distance, the Project would be less than 0.5 degrees of the vertical field of view.	*H* *M* *L* *VL*									*Very Low*	NA	*NA*
9	931 Booroorban-Tchelery Road, Booroorban	80 m	2.03 km	Receptor is located approximately 2.03 km southeast of the Project. The receptor is oriented north-south, with views towards the north. A site visit indicated that vegetation and buildings surround the receptor, obstructing all views toward the Project.	*H* *M* *L* *VL*									*Very Low*	NA	*NA*

Table 14 Private Viewpoint Assessment Results

5.11 Lots with Dwelling Entitlements

The SEARs issued for the Project outlines the following assessment requirements for the LCVIA: "*a detailed assessment of the likely visual impacts of all components of the project on surrounding residences (including approved developments, lodged development applications and dwelling entitlements)*".

There are no lots within 4.0 km of the Project with dwelling entitlements, therefore no further assessment is required.

5.12 Cumulative Impacts on Broader Landscape Character

The occurrence of large-scale renewable energy projects within a region has the potential to alter the perception of the overall landscape character irrespective of being viewed in a single viewshed, as these projects could become part of the existing landscape. It is essential to determine whether the effect of multiple projects and other major infrastructure within the region would combine to become the dominant visual element, altering the perception of the general landscape character. **Figure 16** shows the locations of the surrounding developments in the region and highlights developments within 8.0 km and 25 km of the Project.

The Cumulative Impact Assessment Guidelines (DPIE, 2022) state:

- *"While the study area chosen for each matter must be broad enough to capture all relevant cumulative impacts, it should not be unnecessarily large or include areas where the cumulative impacts are likely to be negligible relative to the baseline condition of the relevant matter" and;*
- *"The application of the cumulative tool (to a distance of 8km from a dwelling or public viewpoint) is based on visibility research which found turbines and objects recede into the background in terms of visibility at 8km."*

5.12.1 Developments Within 8.0 km

Within 8.0 km of the Project there are two (2) large scale renewable energy developments:

- Project EnergyConnect 330kV Transmission Line (Adjacent to southern boundary of Project Area)
- West Nyangay Solar Farm (approx. 5.0 km from Project)

Project EnergyConnect

The proposed 330kV transmission line is proposed in the same alignment as the existing 220kV transmission line. Therefore, the impacts are likely to be low due to the presence of the existing electrical infrastructure in this location.

West Nyangay Solar Farm

The West Nyangay Solar Farm is located approximately 6.4 km east of the Project. The development's horizontal scale, combined with the distance and flat terrain, would limit opportunities for simultaneous views from both public and private receptors within 4.0 km of both projects.

5.12.2 Developments within 25 km

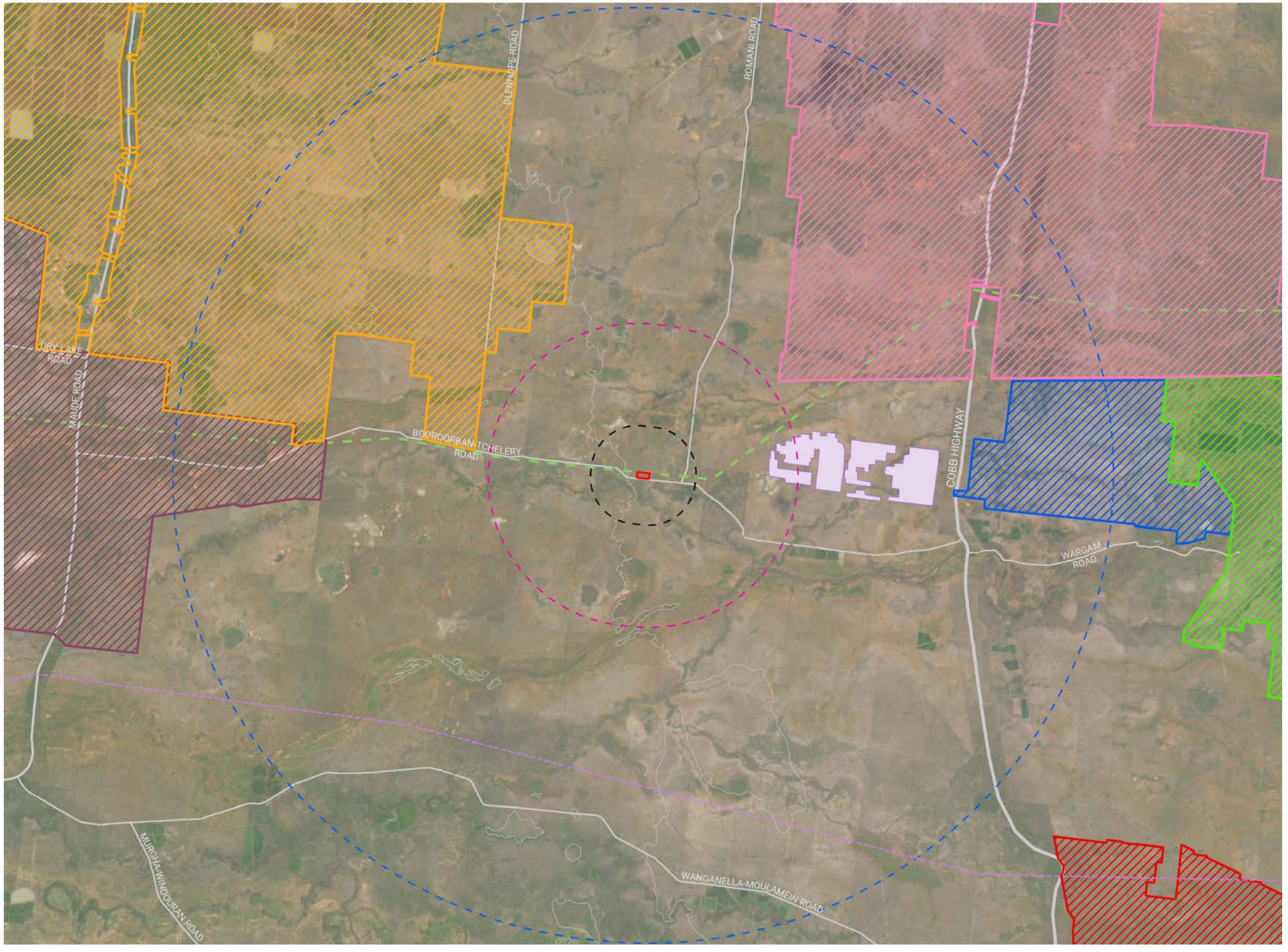
Within 25 km of the Project there are an additional five (5) large scale renewable energy developments:

- The Plains Wind Farm (approx. 8.9 km from Project)
- Abercrombie Wind Farm (approx. 9.0 km from Project)
- Saltbush (Booroorban) Wind Farm (approx. 16 km from Project)
- Tchelery Wind Farm (approx. 18 km from Project)
- VNI West Transmission Line (approx. 16 km from Project)

Cumulative Impacts of Wind Farms

Abercrombie Wind Farm and the Plains Wind Farm are located approximately 9.0km from the Project. While the developments may be visible in combination with the Project due to the flat terrain and lack of screening elements, as they are beyond 8.0 km from the Project, the WTGs would recede visually into the background and would not form a dominant element of the view. Therefore cumulative impacts would be low.

The remainder of the nearby developments are located in excess of 15 km from the Project and are unlikely to have the potential to be viewed in combination with the Project.



Nearby Energy Projects

Refer to Section 5.12

LEGEND

- Site Boundary
- Study Area (2.5 km from Site Boundary)
- 8 km from the Project
- 25 km from the Project
- West Nyangay Solar Farm
- Abercrombie Wind Farm
- Tchelery Wind Farm Boundary
- The Plains Wind Farm Boundary
- Pottinger Wind Farm
- Saltbush (Booroorban) Wind Farm
- Wanganella Renewable Energy Hub
- EnergyConnect 330kV Transmission Line
- Proposed VNI Transmission Line
- Roads
- Contours

0 2 4 6 8 10 km

Figure 16 Nearby Energy Projects
Basemap Source - ESRI, 2024

06 Mitigation Recommendations

6.0 Mitigation Recommendations

6.1 Mitigation Requirements

As discussed in **Section 5.0**, opportunities to view the Project are limited, with only a small section of Booroorban-Tchelery Road that would experience visual impacts from the Project. Due to the Low visual impact no mitigation is required in the form of screen planting.

6.1.1 Design Considerations

While no mitigation is required as a result of the LCVIA findings, the following suggestions would assist in achieving a lower visual impact:

- Existing vegetation generally present around the Project Area would be retained and protected to maintain the existing level of screening to the Project.
- Incorporate setbacks to infrastructure to allow for perimeter screen planting if required in future.
- Consider the height of ancillary structures to ensure the Project does not contrast significantly with the surrounding landscape.
- The colours of the ancillary structures should be considered in the detail design phase to ensure minimal contrast with the surrounding landscape to the extent practicable.

07 Conclusion

7.0 Conclusion

7.1 Conclusion

With all visual impact assessments the objective is not to determine whether the Project is visible or not visible, it is to determine how the Project would impact on existing visual amenity, landscape character and scenic quality. The intent of the LCVIA report is to determine if there is a potential for a negative impact on these factors, and investigated if and how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

Fieldwork was undertaken by Moir Studio in November 2024 to determine the existing landscape character against which the Project has been assessed. The assessment determined the regional landscape character is typical of the Murrumbidgee Subregion of the Riverina Bioregion.

The landscape was categorised into three (3) Landscape Character Zones (LCZs). The Technical Supplement's Scenic Quality Frame of Reference was applied to each LCZ to establish the Scenic Quality Rating of these LCZs which ranged from Very Low to Low.

The visual impact of a solar farm project would depend on the characteristics and values of the existing landscape, the extent to which the existing landscape is changed by the Project and how these changes are perceived by individuals and the broader community. The assessment identified the key landscape features and viewpoints within the Study Area. The Study Area is defined as 2.5km from the Project Boundary.

Due to the flat and generally tree-less character of the landscape within the Study Area, the Project has the potential to be viewed from most areas within the Study Area. However, due to the lack of vertical scale to the Project, key visual features and characteristics of the landscape can be maintained.

The viewpoint assessment determined that there are limited opportunities to view the Project from publicly accessible land and roads. Overall, one viewpoint, VP02 resulted in 'Low' visual impact, all other viewpoints resulted in a rating of 'Very Low' visual impact. No further assessment or mitigation is required from the public viewpoints, however, one photomontage has been included for community consultation to visualise the Project (refer to VP02/PM01).

Further assessment using a photomontage and wireframe demonstrates that even in close proximity to the Project, the small vertical scale of the Project reduces the visual impact to an acceptable level.

Overall, the existing landscape within the Study Area has the ability to absorb the Project with a low degree of visual impact. The Project could be undertaken and maintain the landscape character of the area.

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