



KINGSWOOD BATTERY ENERGY STORAGE SYSTEM

Appendix J
Landscape and Visual Impact Assessment

June 2024
SSD-63207219



Kingswood BESS

Landscape and Visual Impact Assessment

Acknowledgement of Country

Moir Landscape Architecture acknowledge the traditional custodians of the lands and waters of Australia, most notably the Awabakal Nation in which our office resides and the Kamilaroi Nation, the traditional owners of the lands on which this Project resides. We acknowledge their contribution to our community and their deep connection to the land. We pay our respects to Elders both past and present.

Styphelia triflora

Kingswood BESS

Landscape and Visual Impact Assessment

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1.0 Introduction

1.1 Background

Moir Landscape Architecture (Moir LA) have been commissioned by ARCADIS on behalf of Iberdrola Australia Development Pty Limited ‘the Applicant’ to prepare a Landscape and Visual Impact Assessment (LVIA) for Kingswood BESS referred to hereafter as ‘the Project’. The Project is located in the New England region of NSW on the corner of Burgmanns Lane/Ascot-Calala Road, Kingswood, approx 4.5 km east of Kingwood, 2.2 km southeast of Calala and 6.1 km southeast of Tamworth CBD (refer to **Figure 01**) within the Tamworth Regional Council Local Government Area (LGA).

The LVIA will support the statutory approval process for the Project, and is intended to accompany and inform the Environment Impact Statement (EIS).

This LVIA report provides a comprehensive assessment of visibility and potential visual impacts associated with the Project, including the landscape character, landscape amenity and any significant scenic vistas.

Fieldwork was undertaken in November 2023, using key viewpoints within the localised region as defined by the Study Method in **Section 2.0** of this report. The report details the results of fieldwork, documents the assessment of the landscape character and visual setting, and provides recommendations to assist in the mitigation of any potential impacts resulting from the proposed development.

1.2 Relevant Experience

Moir LA is a professional design practice and consultancy specialising in the areas of Landscape Architecture, Landscape Planning and LVIAs. Our team has extensive experience in undertaking LVIAs for large-scale infrastructure projects, including the renewables, industrial and commercial developments in visually sensitive areas. Our capabilities include digital terrain modelling, viewshed assessment, photomontage development, landscape character assessments and community consultation.



Figure 01 – Regional Context
Imagery Source: Google Earth, 2023



1.3 Report Structure

The following table provides an outline of the report structure and a summary the elements addressed in the LVIA. Detailed methodologies for each section of the assessment have been included in the relevant chapters of the report.

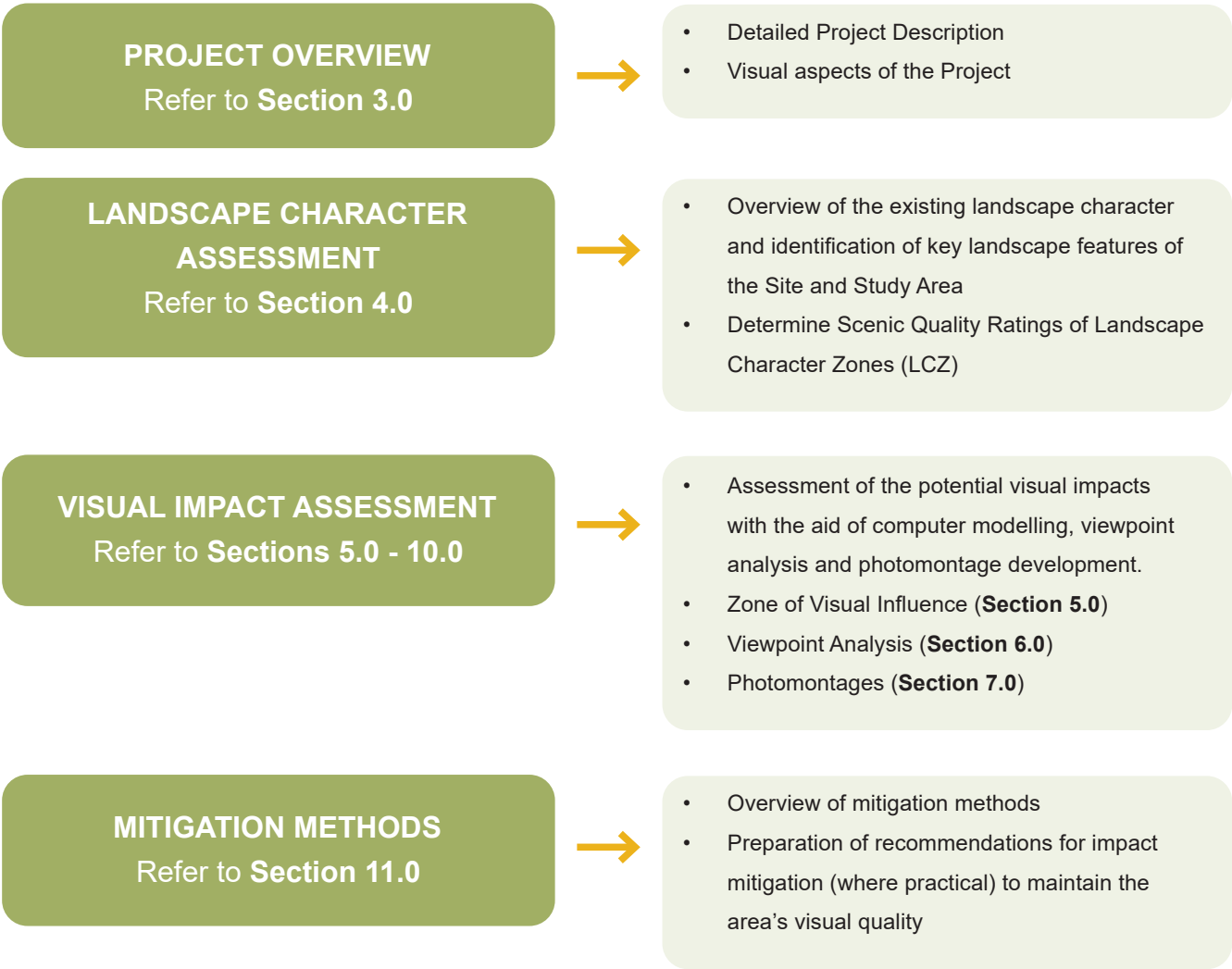
Visual Impact Assessment Report Structure	
Section 2.0: Study Method	Overview of Study Method utilised for the LVIA.
Section 3.0: Project Overview	Project Description and overview of the Project and all components to be assessed within the LVIA.
Section 4.0: Existing Landscape Character	Establish the existing landscape and visual conditions prior to undertaking any visual assessment.
Section 5.0: Zone of Visual Influence	Assessment to identify potential visual impacts.
Section 6.0: Viewpoint Analysis	Assessment of key viewpoints within the visual catchment and Study Area.
Section 7.0: Photomontages	Preparation photomontages to illustrate the appearance of the Project.
Section 8.0: Visual Impact Assessment	Assessment of the visual impacts resulting from the Project.
Section 9.0: Nightlighting	Overview of potential nightlighting sources.
Section 10.0 Cumulative Visual Impacts	Assessment of cumulative visual impacts of associated infrastructure.
Section 11.0: Mitigation Recommendations	An outline of proposed mitigation and management options.
Section 12.0: Conclusion	

Table 01 – Report Structure

2.0 Study Method

2.1 Overview of the Study Method

The following provides an overview of the Study Method utilised for undertaking the LVIA. This methodology is based on the relevant policies, frameworks and our experience in undertaking LVIA for large infrastructure projects. The LVIA was undertaken in the stages as noted below:



2.2 Landscape Character Assessment

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 Landscape Character of the Study Area has been assessed at a regional, local and site scale. This assessment will utilise existing topographic maps, site imagery and land use maps using two (2) kilometres as the defined 'Study Area' from the Project Site.

2.2.1 Landscape Character Zones and Scenic Quality

Once the Landscape Character has been assessed, the LCZ can be identified within the Study Area.

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*’ (DPHI, 2022). Each category of the ‘Frame of Reference’ (refer to **Table 02**) has been quantified for each LCZ to determine a ‘Scenic Quality’ rating of ‘**High**’, ‘**Moderate**’ or ‘**Low**’.

Viewpoint Type	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	- 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 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
Waterbodies	- Absence of natural waterbody - Farm dams, irrigation canals or stormwater infrastructure	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	- Local 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, - Commonwealth 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	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

Source: Adapted from the DPHI Technical Supplement - LVIA

2.2.2 Receptor Sensitivity Rating

Receptor sensitivity relates to the relative importance of receptors (refer to **Table 03**) and the value that the community or visitors may place on landscapes viewed from public use areas, public travel ways and private receptors such as receivers. The sensitivity of each viewpoint into one of four (4) sensitivity ratings (**‘Very Low’**, **‘Low’**, **‘Moderate’**, **‘High’**). The intent is to classify the viewer sensitivity on the LCZ in which the Project is being viewed and assessed based on the Landscape Character Assessment.

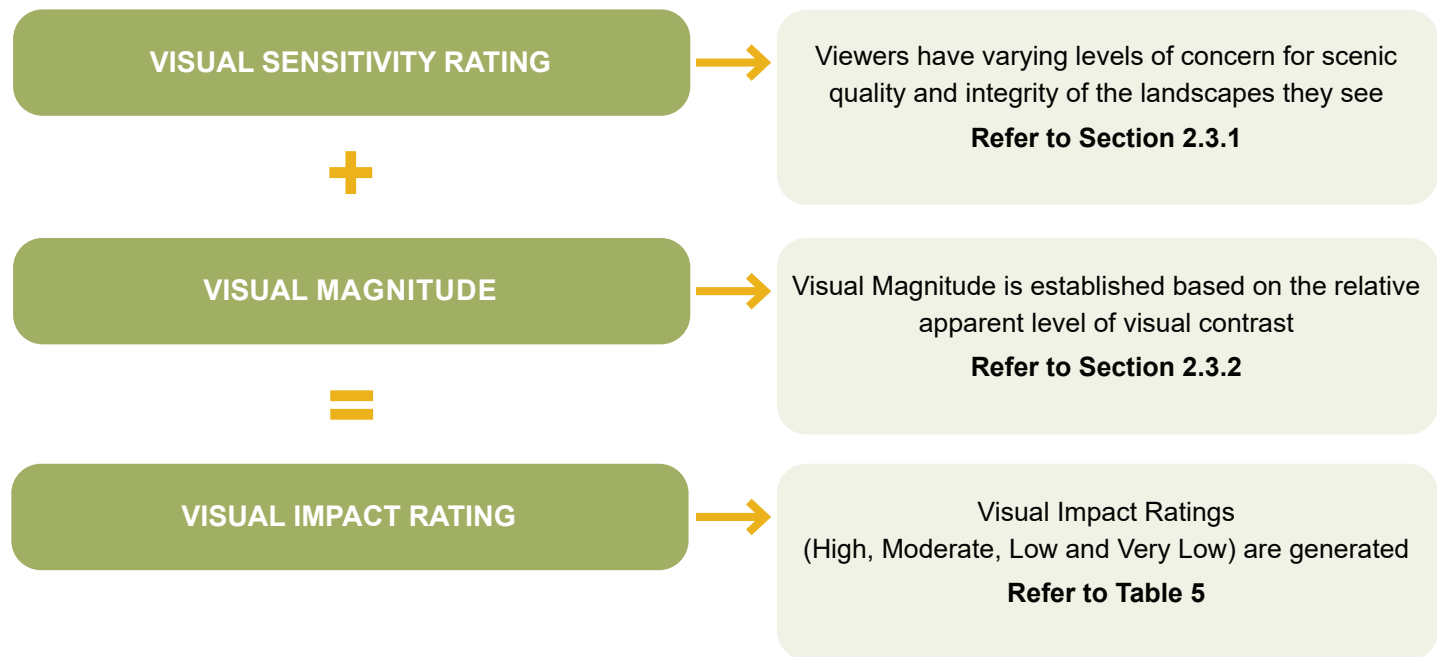
Receptor Sensitivity Rating	
Very Low	- Local sealed and unsealed roads - Passenger rail lines with daily daylight services - State highways, freeways and classified main roads - Walking tracks and navigable waterways
Low	- Secondary view from receivers in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and in environmental or conservation areas (zoned C2, C3 and C4) - Tourist roads and scenic drives - Walking tracks and navigable waterways - Cemeteries, memorial parks
Moderate	- Primary view from receivers in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and in environmental or conservation areas (zoned C2, C3 and C4) - Tourist and visitor accommodation and places of worship (such as bed and breakfasts, motels, hotels) - Tourist uses in tourist areas (zoned SP3) - Publicly accessible green and open spaces including picnic areas, parks, public recreation areas - Town centres and central business districts
High	- Receivers in residential areas and rural villages (land zoned R1, R2, R3, R4 and RU5) - Historic rural homesteads/residences on the national, state or local heritage list

Table 03 – Receptor Sensitivity Rating

Source: Adapted from the DPHI Technical Supplement - LVIA

2.3 Visual Impact Assessment

The potential visual impact of the Project is then assessed based on the relationship between the visual sensitivity (refer to **Section 2.3.1**) and visual magnitude (refer to **Section 2.3.2**).



2.3.1 Visual Sensitivity

Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to change. Visual Sensitivity, defined by the DPHI ‘refers to the quality of the existing view and how sensitive the view is to the proposed change’. The ‘visual sensitivity is determined by identifying the sensitivity of each viewpoint and categorising the scenic quality of the area in view’. (DPHI, 2022).

For example, a significant change that is not frequently seen may result in a low visual sensitivity although its impact on a landscape may be high. Generally the following principles apply:

- Visual sensitivity decreases as the viewing time decreases;
- Visual sensitivity decreases as the number of potential viewers decreases; and
- Visual sensitivity can also be related to viewer activity (e.g. a person viewing a Project Site whilst engaged in recreational activities will be more effected by change than someone passing a scene in a car travelling to a desired destination).

Visual Sensitivity ratings are defined as ‘**High**’, ‘**Moderate**’ and ‘**Low**’ based on the Scenic Quality and Receptor Sensitivity.

VISUAL SENSITIVITY RATING				
		SCENIC QUALITY Landscape Character Zones		
		High	Moderate	Low
RECEPTOR SENSITIVITY	High	High	High	Moderate
	Moderate	High	Moderate	Moderate
	Low	Moderate	Low	Low
	Very Low	Low	Very Low	Very Low

Table 04 – Visual Sensitivity Rating

2.3.2 Visual Magnitude

Visual magnitude refers to the extent of change that will 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.*

2.3.3 Visual Impact

Visual Impact refers to the change in appearance of the landscape as a result of the Project. Visual Impact is the combined effect of visual sensitivity and visual magnitude. Various combinations of visual sensitivity and visual magnitude will result an overall visual impacts (refer to Table 05).

This process involves a qualitative assessment of the conclusions of visual impact ratings for each viewpoint. The analysis takes into consideration other relevant influencing factors not easily addressed through the process of quantitative analysis.

VISUAL IMPACT RATING					
		VISUAL MAGNITUDE			
		High	Moderate	Low	Very Low
VISUAL SENSITIVITY	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 05 – Visual Impact Rating
Source: MLA, 2023

2.4 Guideline and Statutory Framework

An overview of the guidelines, relevant frameworks and considerations of authorities utilised to form the methodology for this LVIA is provided in the following section.

2.4.1 Secretary's Environmental Assessment Requirements (SEARs)

SEARs have been issued for the Project on the 30/10/23. The Landscape & Visual requirements as part of the SEARs are outlined as follows:

- *'including a detailed assessment of the likely visual impacts of all components of the project (including transmission lines, substations and any other ancillary infrastructure) on surrounding residences and key locations, scenic or significant vistas and road corridors in the public domain and provide details of measures to mitigate and/or manage potential impacts;'*

3.0 Project Overview

3.1 Regional Context

The Project is in the Nandewar Region in NSW, located within the Tamworth Regional LGA, approximately 6.1 km southeast from Tamworth CBD (Refer to **Figure 01**). Tamworth Regional LGA encompasses a total area of approximately 9892 sq. km and is bordered by Gwydir LGA to the north, Uralla LGA to the northeast, Walcha LGA to the southeast and Liverpool Plains to the southwest.

3.2 Project Site

The Project Site is located approximately 2.2 km southeast of Calala mainstreet, on the corner of Burgmanns Lane and Ascot-Calala Road, lot 43: DP1064582 and covers approximately 40.12 ha.

The Project Site is currently used for agricultural practices and energy distribution, with the 330kV Transmission Corridor connecting to Tamworth substation running through the site. The infrastructure, along with the open pastured and scattered vegetation, forms part of the site character. The terrain is classified as undulating with the site located on an east facing slope, with an elevation profile between 457 m – 422 m AHD.

The Project Site is located at 744 Burgmanns Lane, Kingswood New South Wales (NSW) 2340 (lot 43: DP1064582), with the BESS located in the southwest corner of the lot.

3.3 The Project

The Project would have a capacity of up to 270 Megawatts (MW) and provide up to 1080 Megawatt-hours (MWh) of battery storage capacity.

The Project would involve construction and operation of the following:

- BESS including battery enclosures, inverters, transformers, switch gear and control building
- Onsite 33/330 kV substation (BESS substation) to convert electricity between the high voltage transmission network and medium voltage BESS
- High voltage transmission connection (above ground and/or below ground) between the BESS and the Tamworth substation
- Ancillary infrastructure and mitigative features including:
 - Site access to the BESS from Ascot-Calala Road
 - Internal site access road and parking
 - Permanent office and staff amenities
 - Operations and maintenance building
 - Stormwater management infrastructure
 - Services and utilities
 - Lighting, fencing and security devices
 - Noise acoustic barriers
 - Asset protection zone
 - Landscaping and screening vegetation.

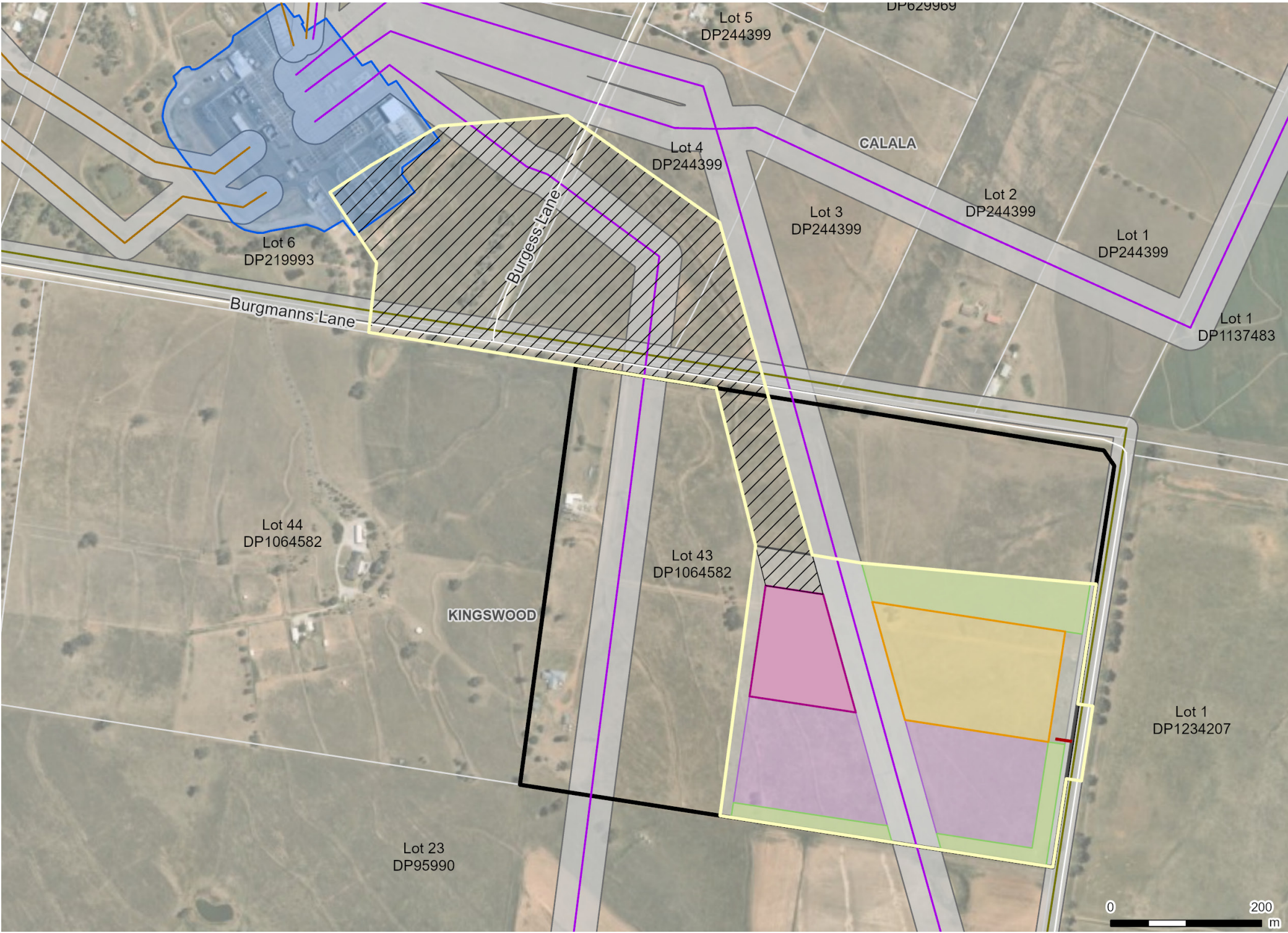
The BESS will operate 24 hours a day, seven days a week and be monitored remotely, with infrastructure maintenance undertaken onsite. An overview of the Project is shown in **Figure 02**.

3.4 Study Area

The Study Area, as defined in **Section 2.2**, is the area where the visual baseline assessment for the Project is undertaken (refer to **Figure 03**) and includes land within two (2) kilometres from the Project Site. The landscape within the Study Area is assessed for its scenic quality and landscape character to assist in determining the overall visual sensitivity when undertaking the visual impact assessment component of this report.

Project Layout

Refer to Section 3.3



LEGEND

Existing infrastructure

- Tamworth substation
- Transmission line
 - 66kV
 - 132kV
 - 330kV
- Transmission line easement

Proposed

- Project Site
- Development envelope
- BESS facility
- BESS
- BESS substation
- Ancillary infrastructure and construction laydown
- Landscaping
- Transmission corridor
- Access

Figure 02 – Project Layout
Basemap Source: Figure Provided by ARCADIS



Study Area

Refer to Section 3.4

LEGEND

-
-  2km Study Area
 Project Site
 Existing Transmission Line
 Lot
 Contour 10m
 Hydroline
 Road

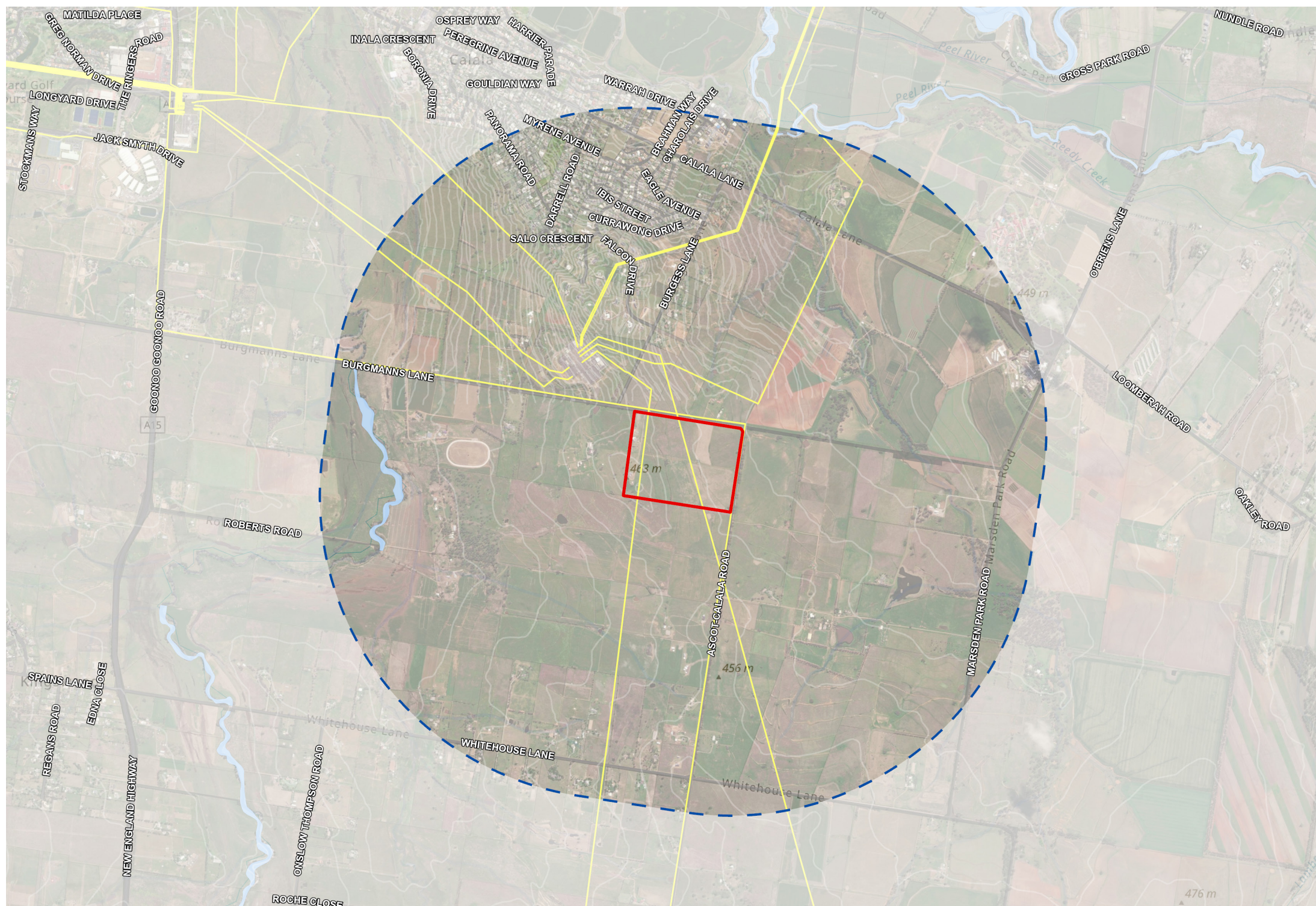


Figure 03 – Study Area

Basemap Source: ARCGIS 2024, SEED 2019



4.0 Existing Landscape Character

4.1 Existing Landscape Character Analysis

The purpose of the landscape character analysis is to establish the landscape and visual conditions through descriptions, mapping and photographic representation to capture the sense of place for the Project. The intent is to provide a baseline against which the potential visual impacts of the Project can be assessed.

The Study Method for undertaking the landscape character analysis has been established in the ‘Guideline for Landscape Character and Visual Impact Assessment’ (TNSW, 2020) in conjunction with the *Technical Supplement - Landscape & Visual Impact Assessments for Large Scale Solar Projects* (DPHI, 2023).

4.2 Bioregion Context

The Project is located in the Nandewar bioregion. The Nandewar bioregion is situated in northern New South Wales and extends north past the Queensland border, covering approximately 2,701,977 ha in total. It is bordered by four (4) other bioregions in New South Wales, which includes the New England Tablelands to the east and Brigalow Belt South Bioregion to the west. The bioregion spans to include the areas around Inverell and Tamworth and the smaller towns of Quirindi, Bingara, Barraba, Manilla and Bendemeer.

The region is characterised by hilly landforms with variable topography, bordering the western edge of the New England Tablelands. Formed on Palaeozoic sedimentary rocks, the region contains limestones, basalts, and sandstone. It is predominately characterised by clay or loam soils with stony soils on the ridgelines.

Within the ‘Peel’ subregion, the bioregions features are defined as:

- **Geology:** *Fine grained Silurian to Devonian sedimentary rocks. Strongly folded and faulted with marked northwest alignment. Areas of sub-horizontal Carboniferous shales and sandstones in the north. Limited areas of basalt cap from the Nandewar and Liverpool Ranges are included. Linear outcrops of serpentinite and scattered bodies of limestone*
- **Characteristic Landforms:** *Low peaked hills with north-westerly alignment. Basalt caps of dissected flows, moderate slopes and flat river valleys with alluvium. Karst landscapes in limestone*
- **Vegetation:** *White box grassy woodlands, with yellow box and Blakely’s red gum on lower slopes. Rough-barked apple and yellow box on flats. River oak and some river red gum along major streams. Patches of red stringybark and red ironbark on steeper slopes in the east. Silver-leaved ironbark on basalt caps, white cypress pine and kurrajong on stony areas in the west and north. Very large grass*

trees on serpentinite. (NPWS, 2003)

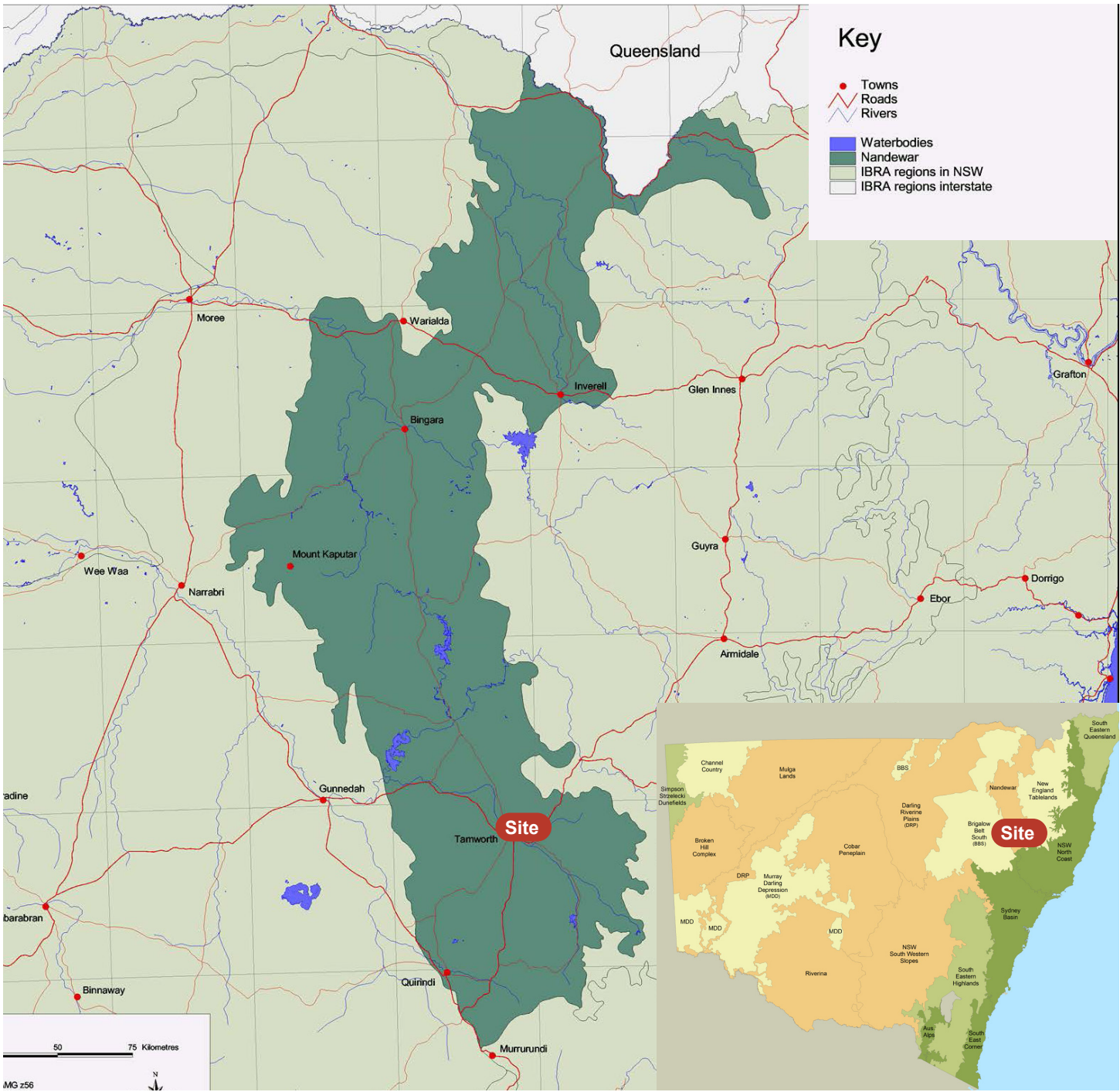
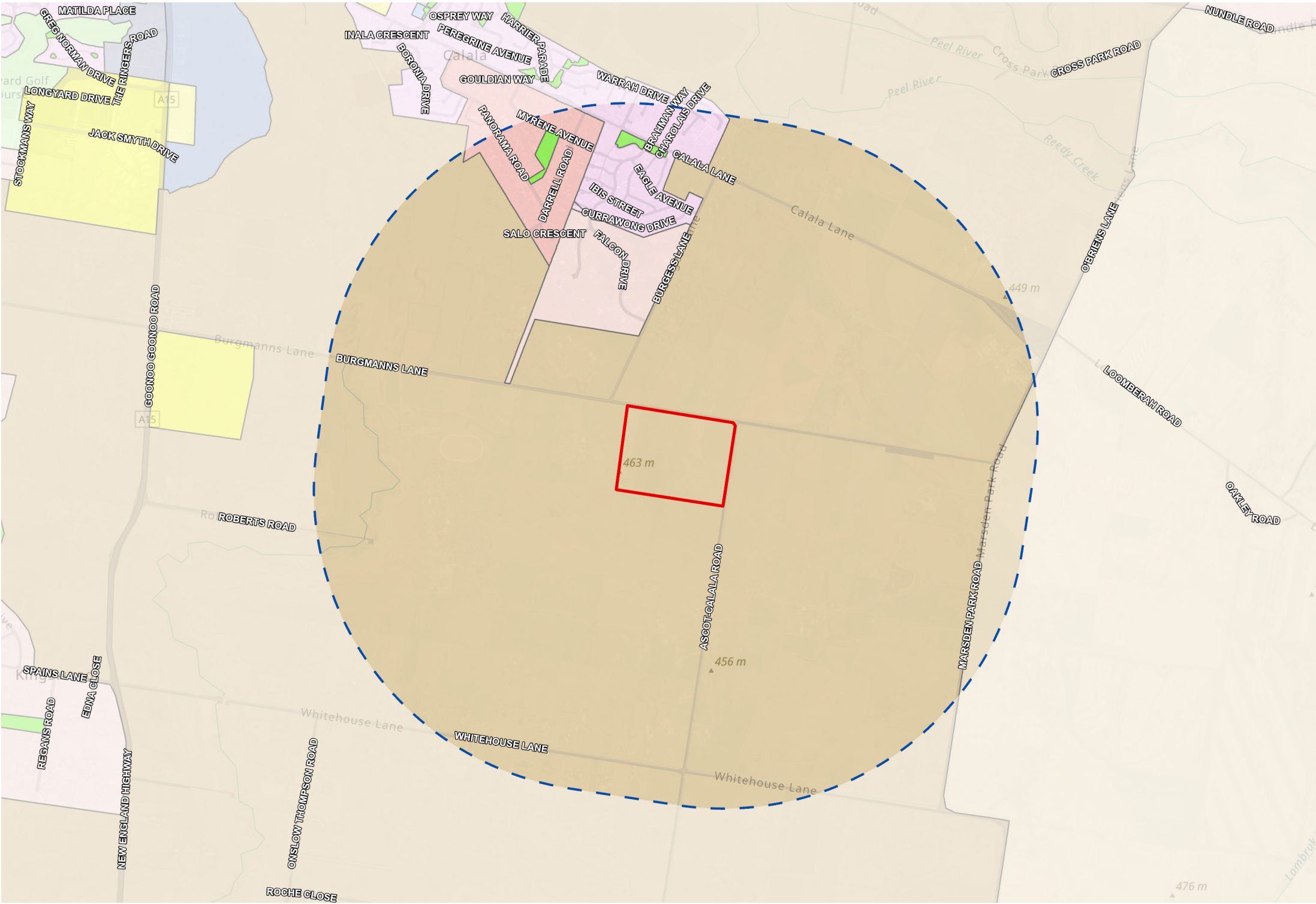


Figure 04 – Bioregion
Imagery Source: NPWS, 2003 & DPHI, 2023



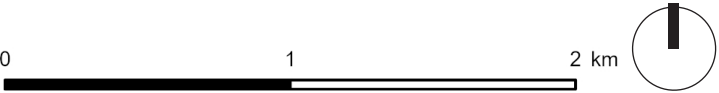
Land Zoning

Refer to Section 4.3

LEGEND

- 2km Study Area
- Project Site
- Roads
- Land Zoning:
 - B4
 - B5
 - R1
 - R2
 - R5
 - RE1
 - RU1
 - RU4
 - SP2
 - SP3

Figure 05 – Land Zoning
Basemap Source: ARCGIS 2024, NSW Spatial Data 2024



4.3 Land Zoning

The Project is located within the Tamworth Regional Council Local Government Area (LGA) where the Tamworth Regional Local Environment Plan (LEP) 2010 applies. The following provides an overview of the land zoning within the immediate surrounds of the Project as shown in **Figure 05**.

4.3.1 RU4 Primary Production Small Lots

The Project Site is zoned as RU4 Primary Production Small Lots as shown in **Figure 05**. This land zoning is defined by small lot rural properties. There are no visual objectives outlined under this LEP for this zoning type.

4.3.2 R5 Large Lot Residential

The Project Site is located to the southeast of existing rural residential properties, zoned as R5 Large Lot Residential as shown in **Figure 05**. One objective relating to visual for this zoning type is *‘to provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.’*

4.3.3 R1 General Residences

The Project Site is located to the southeast of existing residential properties, zoned as R1 General Residences as shown in **Figure 05**. No visual objectives are outlined under this LEP for this zoning type.

4.3.4 R2 Low Density Residential

The Project Site is located to the southeast of residential properties, zoned as R2 Low Density Residential as shown in **Figure 05**. No visual objectives are outlined under this LEP for this zoning type.

4.3.5 RE1 Public Recreation

The Project Site is located to the southwest of existing public parks, zoned as RE1 Public Recreation as shown in **Figure 05**. One objective relation to visual for this zoning type is *‘to protect and enhance the natural environment for recreational purposes.’*

4.3.6 RU1 Primary Production

Land located to the east of the Project Site within the two (2) kilometre extent as shown in **Figure 05** is zoned as RU1 Primary Production. There are no visual objectives outlined under this LEP for this zoning type.



Image 01 – Typical Rural Residential Property and Gentle Undulations
(Moir LA - 11/2023)



Image 02 – Typical of Large Lot Residential Properties, in Calala with transmission infrastructure
(Moir LA - 11/2023)

4.4 Land Use

Land Use within the Study Area as shown in **Figure 06**, as defined by land use mapping published by the NSW Government (SEED, 2019) and created 2017, predominantly comprises -

- 2.1.0 Grazing Native Vegetation
- 3.1.0 Plantation Forests
- 3.2.0 Grazing Modified Pastures
- 3.3.0 Cropping
- 4.3.0 Irrigated Cropping
- 5.4.0 Residential and Farm Infrastructure
- 5.5.0 Services
- 5.6.5 Electricity Substations and Transmission

The Project Site and immediate surrounds comprise of agricultural practices including grazing modified pastures, grazing native vegetation, cropping and irrigated cropping, and some plantation forests (Refer to **Image 03**). Rural residential properties are dotted throughout agricultural lands. The suburb of Calala, with denser rural residences, is located to the northwest of the Project Site.

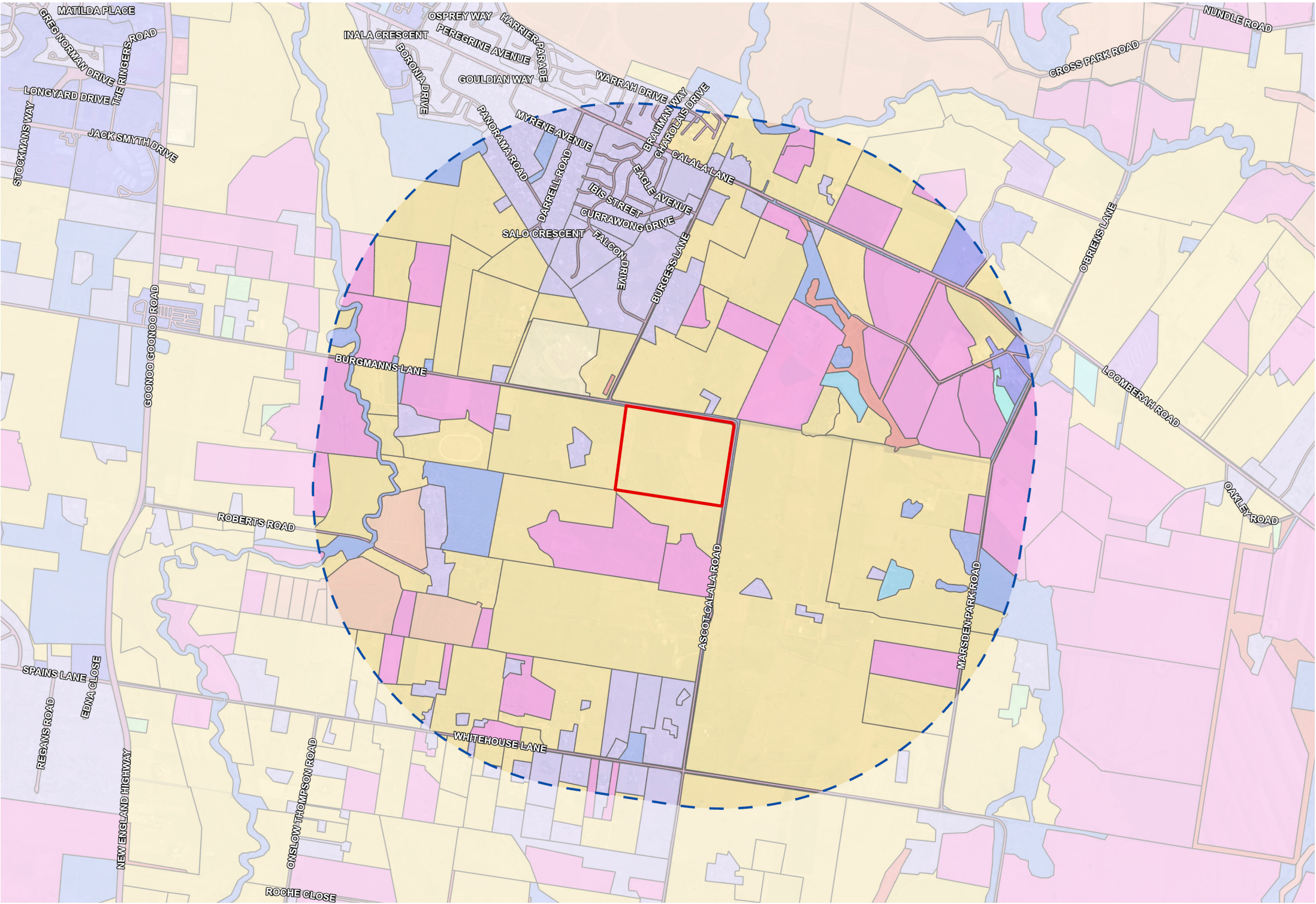
Utility services, of which includes Tamworth Transgrid Substation and associated transmission lines and infrastructure and is located approximately 0.4 km northwest from the Project Site.



Image 03 – Typical of Surrounding Agricultural Land with Open Grazing Pastures and Cropping
(Moir LA - 11/2023)



Image 04 – (Drone Image) Agricultural Pastures with Transmission Lines Above
(Moir LA - 04/2023)



Land Use

Refer to Section 4.4

LEGEND

- Project Site
- 2km Study Area
- Roads
- 1.2.0 Managed resource protection
- 2.1.0 Grazing native vegetation
- 3.1.0 Plantation forests
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 3.4.0 Perennial horticulture
- 4.2.0 Grazing irrigated modified pastures
- 4.3.0 Irrigated cropping
- 5.2.0 Intensive animal production
- 5.3.0 Manufacturing and industrial
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 5.9.0 Waste treatment and disposal
- 6.2.0 Reservoir/dam
- 6.3.0 River

Figure 06 – Land Use
Basemap Source: ARCGIS 2024, NSW Landuse 2023



4.5 Key Landscape Features

4.5.1 Topographical Character

The topographical character of the landscape within the Study Area typically consists of gentle undulating hills in a north westerly alignment, within the range of 457 - 393 AHD. Located on the western boundary of the Project Site is the high point (at 457 AHD) of the Study Area. Vegetated ranges associated with the New England Tablelands are visible through the study area to the far north to southeast, adding to the visual landform. (Refer to **Image 05** and **Image 06**).

Within the Project Site, the terrain is typical of the surrounding Study Area. Located on an east facing slope on a hill with a northwest alignment, the Project Site has an elevation range between 457 - 422 ADH.

4.5.2 Hydrological Character

Man-made dams are dotted throughout the surrounding farmland to aid in agricultural practices (Refer to **Image 05**). Small creeks weave through the surrounding hills with scattered vegetation lining their embankments. These include:

- Calala Creek located approximately 0.86 km northeast from the Project Site.
- Goonoo Goonoo Creek running roughly north south and located approximately 1.57 km to the west of the Project Site.
- Goonang Creek which feeds into Goonoo Goonoo Creek, located approximately 1.40 km to the southwest of the Project Site (Refer to **Image 06**).

4.5.3 Vegetation Character

Vegetation within the Study Area is typical of the Peel subregion as outline in **Section 4.2**, with predominantly scattered vegetation within extensive pasture areas. Dominant vegetation communities consist of eucalyptus varieties including White Box, Yellow Box and Blakely's red gum (Refer to **Image 05** and **Image 06**).

Within the Project Site, vegetation is limited to a few lone trees dotting the existing site. In the immediate surroundings, vegetation is mainly associated with agricultural practices, specifically in the form of windbreaks, screening elements and lone trees dispersed in surrounding fields. Additionally, a scattered grove of trees is located to the northwest of the Project Site and another to the southwest.



Image 05 – (Drone Image) Gently Undulating Farmland with Dams and Vegetated ranges of New England Tablelands in Far-ground (*Moir LA - 04/2023*)



Image 06 – (Drone Image) Cropping with Scattered Vegetation and Creekline (*Moir LA - 04/2023*)

4.5.4 Roads

The Project is bounded by Burgmanns Lane to the north and Ascot-Calala Road to the east, both low use, unsealed roads and used by the surrounding residences.

The New England Highway is located approximately 3.1 km west of Project Site and is a major inland road that forms part of the route connecting Sydney to Brisbane (refer to **Image 07**).

Other low use roads servicing nearby rural properties and residential receivers are identified as -

- Burgess Lane to the northwest of the Project Site.
- Calala Lane to the north of the Project Site.
- Marsden Park Road to the east of the Project Site.
- Whitehouse Lane to the south of the Project Site.

4.5.5 Infrastructure

Within the agricultural pastures, energy infrastructure is present to the northwest of the Project Site (approx. 300 m). The Tamworth Transgrid Substation is located to the north of Burgemanns Lane and associated infrastructure including transmission lines run southeast-northwest through the Project Site. Whilst surrounding topography and screening vegetation restrict the visibility of the substation from the southern and western sides, the associated transmission lines are a prominent existing feature in the landscape (Refer to **Image 08**).

4.5.6 Rural Residential and Urban Development

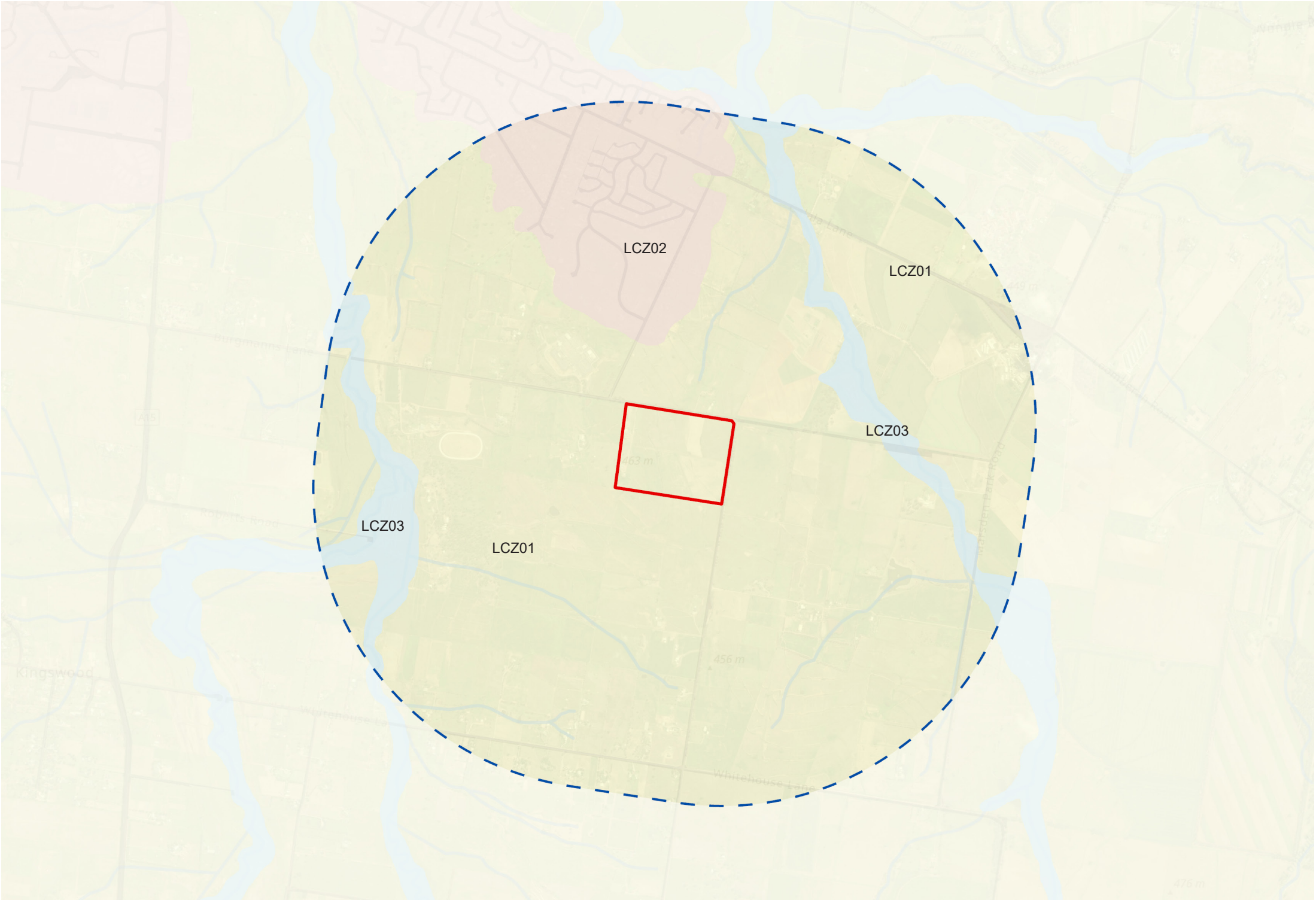
The Regional Centre of Tamworth CBD is located approx. 6 km northwest of the Project Site. The suburb of Calala sits between Tamworth and the Project Site and is located approx. 2.2 km northwest from the Project. With an estimated population of 4,577 (ABS 2021), the suburb of Calala is zoned as R1 General Residential, R2 Low Density Residential and R5 Large Lot Residential. Development in the last 10 years has extended housing westward, to approx. 0.55 km northwest from the Project Site. Calala is characterised by single story houses on acreage, with vegetation in the area typically in the form of visual amenities like wind breaks or screening elements that surround receivers (refer to **Image 02**).



Image 07 – (Drone Image) New England Highway with Surrounding Agricultural Land
(Moir LA - 04/2023)



Image 08 – Gently Undulating Pastures with Transmission Line Infrastructure Above
(Moir LA - 11/2023)



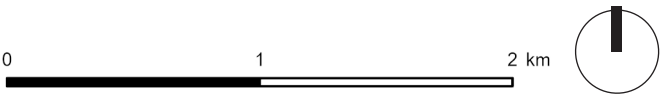
Landscape Character Zones

Refer to Section 4.6

LEGEND

- Project Site
- 2km Study Area
- Roads
- LCZ01 Grazing & Cropping Pastures
- LCZ02 Town
- LCZ03 Creek Corridors

Figure 07 – Landscape Character Zones
Basemap Source: ARCGIS 2024



4.6 Landscape Character Zones

4.6.1 LCZ01 Grazing & Cropping Pastures

Land within this LCZ is predominately zoned as RU4 Primary Production Small Lots. Characterised by undulating cleared pastures, the land has been modified for agricultural production, specifically for grazing and cropping (as shown in land use mapping), with low density rural residential properties dispersed throughout. Scattered remnants of vegetation are typically in the form of lone trees, windbreaks and residential vegetation associated with receivers, with a few small patches of woodlands near the creeks and ridgelines. Waterbodies are generally in the form of man-made farm dams or seasonal creeks. The Tamworth substation and associated transmission line infrastructure is viewed as a key landscape feature in the area.



Image 09 – Undulating Pastures along Marsden Park Road. (Moir LA - 11/2023)



Image 10 – Undulating Pastures along Ascot-Calala Road. (Moir LA - 11/2023)

LANDSCAPE CHARACTER ZONE	KEY LANDSCAPE FEATURES	KEY VIEWPOINTS	Application of Scenic Quality Rating Frame of Reference					SCENIC QUALITY RATING
			Landform	Vegetation	Waterbodies	Social Cultural	Human Presence	
LCZ01- Grazing & Cropping Pastures	Rural Properties Fields for Grazing and Cropping Tamworth substation and Associated Transmission Infrastructure	Ascot-Calala Road Burgmanns Lane Marsden Park Road	H					LOW
			M					
			L					

4.6.2 LCZ02 Town

This LZC is defined by undulating plains and flats comprised of urban infrastructure located within the suburb of Calala including large and small residential lots, commercial and industrial developments. The landscape is highly modified within this LCZ, with limited vegetation in the form of windbreaks and residential vegetation associated with receivers. The Tamworth substation and associated transmission line infrastructure is viewed as a key landscape feature in the area.



Image 11 – Typical Small Residential Lots within Calala. (Moir LA - 11/2023)



Image 12 – Typical Large Residential Lots within Calala. (Moir LA - 11/2023)

LANDSCAPE CHARACTER ZONE	KEY LANDSCAPE FEATURES	KEY VIEWPOINTS		Application of Scenic Quality Rating Frame of Reference					SCENIC QUALITY RATING
				Landform	Vegetation	Waterbodies	Social Cultural	Human Presence	
LCZ02- Town	Residential Developments Commercial Developments Urban Infrastructure	Pinstripe Road Burgess Lane Calala Lane	H						LOW
			M						
			L	■	■	■	■	■	

4.6.3 LCZ03 Creek Corridors

This LCZ is defined by watercourses including Calala, Goonoo Goonoo and Goonang Creeks. Land around these creeks is typical is the bioregion, composed of flat valleys cleared for agricultural purposes including grazing and cropping, with some remnants of riparian vegetation visible on the banks.



Image 13 – Typical Creeks within the Tamworth Area. (Moir LA - 04/2023)



Image 14 – Typical Creeklines within the Tamworth Area. (Moir LA - 04/2023)

LANDSCAPE CHARACTER ZONE	KEY LANDSCAPE FEATURES	KEY VIEWPOINTS	Application of Scenic Quality Rating Frame of Reference					SCENIC QUALITY RATING
			Landform	Vegetation	Waterbodies	Social Cultural	Human Presence	
LCZ03- Creek Corridors	Calala Creek Goonoo Goonoo Creek Goonang Creek	Burgmanns Lane	H					LOW
			M					
			L					

5.0 Zone of Visual Influence

5.1 Zone of Visual Influence Overview

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.

5.2 Zone of Visual Influence Summary

The ZVI for the Project has been prepared based on the maximum assumed height for the Project within the Project Site (refer to **Figure 09**). To provide a worst case scenario the ZVI is based on the following parameters. Noise wall heights between 8 - 3 m, max substation height of 9.2 m

An additional ZVI has been prepared for the Project which includes the potential transmission line easement between the BESS and Tamworth substation. To provide a worst case scenario the ZVI is based on the following parameters. Transmission tower height of 60m, noise wall heights between 8 - 3 m, max substation height of 9.2 m.

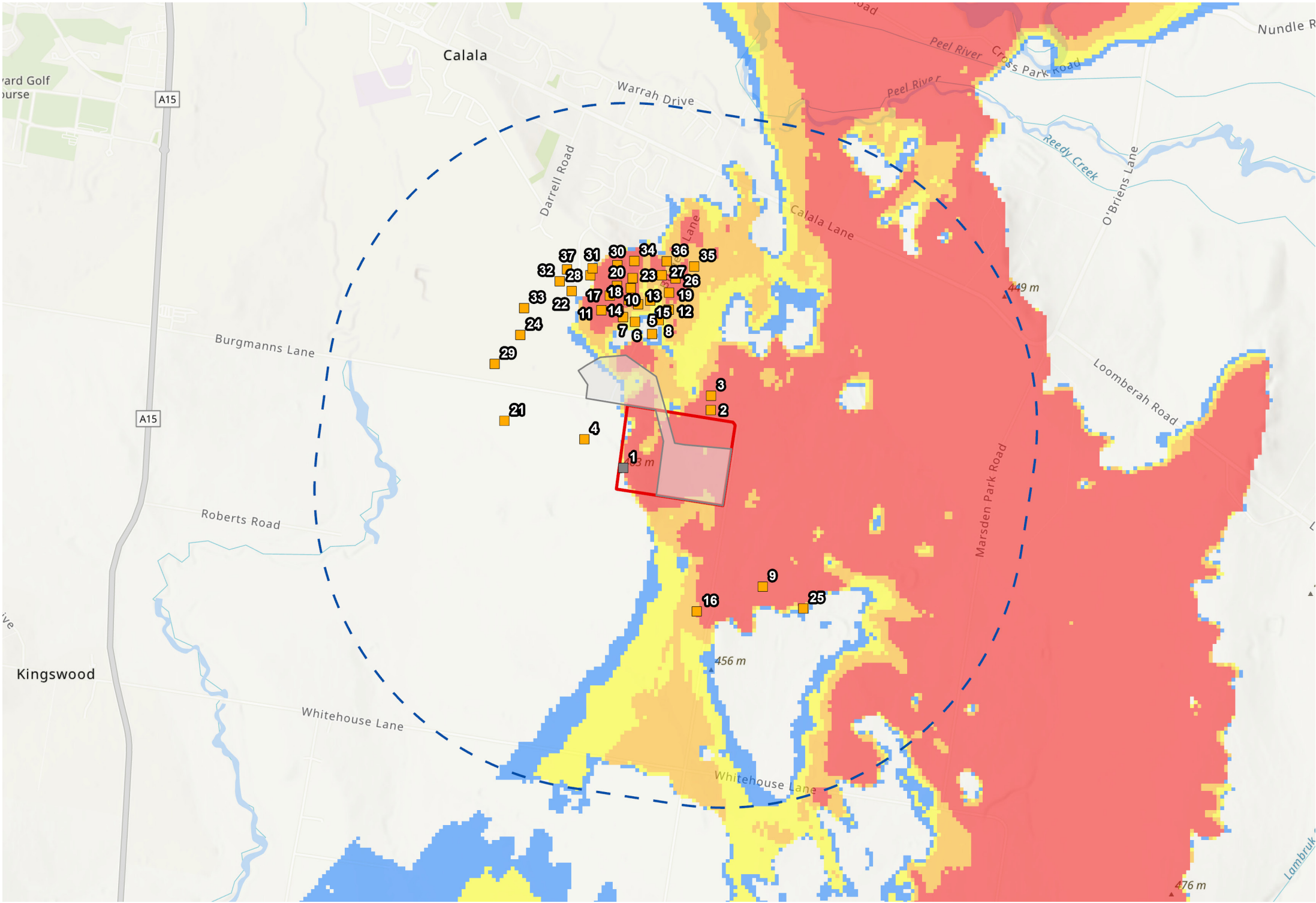
Summary of Findings:

- Within 1 km from the Project Site, 36 non-associated receivers were identified (data provided by ARCADIS).
- Within 1 km of the Project Site, all receivers have been identified as having potential visibility of the Project based on topography alone.
- By comparing the two (2) ZVI's, it can be concluded that eight (8) of the non-associated receivers have been identified as having potential visibility of the transmission line easement only (if overhead) (i.e not the BESS facility).

The ZVI has been used to identify areas of potentially high visibility which will inform fieldwork ground truthing and the viewpoint analysis (refer to **Section 6.0**) to identify locations requiring detailed assessments.

It is noted that the ZVI analysis represents a worst case scenario as existing screening including structures or vegetation have not been considered within the preparation of the ZVI's (i.e. a bare ground scenario as discussed in 5.1). However, the proposed vegetation screening will reduce the visual impacts of the Project to acceptable levels.

Further assessment and fieldwork ground truthing is required to determine the potential visual impacts in the aforementioned locations.



Zone of Visual Influence

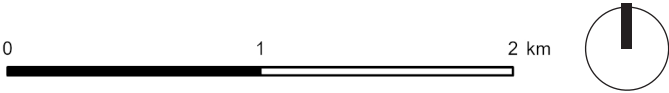
Refer to Section 5.2

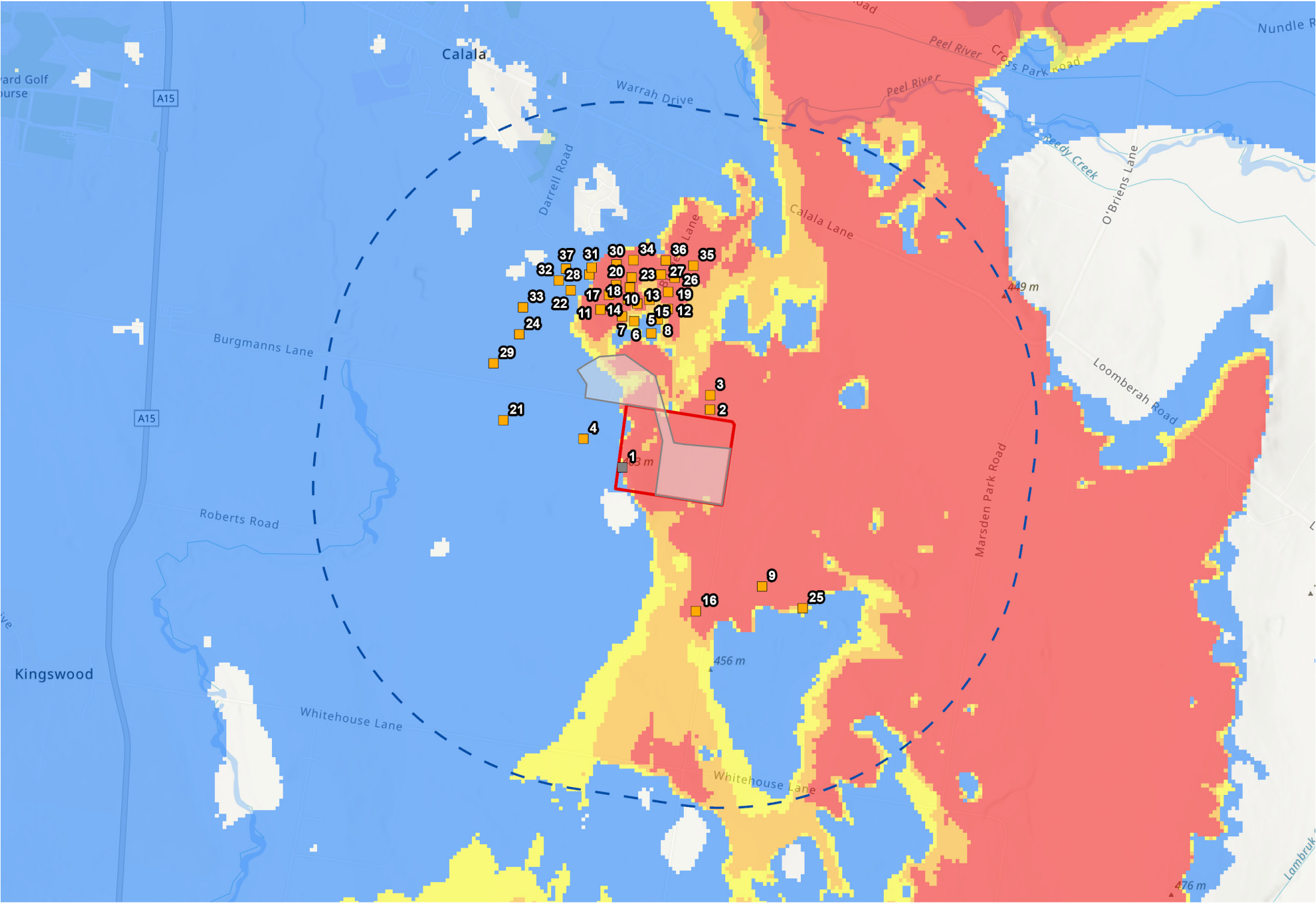
LEGEND

- Project Site
- 2km Study Area
- Development Site
- Associated Reciever
- Non-associated Reciever
- ZVI Percentage of Project Visible
 - 0%
 - 0 - 25%
 - 25 - 50%
 - 50 - 75%
 - 75 - 100%

NOTE
ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. 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 the map is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.

Figure 08 – Zone of Visual Influence
Basemap Source: ARCGIS 2024, WINDPRO 2024





Zone of Visual Influence with Transmission Lines

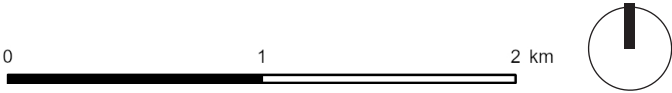
Refer to Section 5.2

LEGEND

- Project Site
- 2km Study Area
- Development Site
- Associated Reciever
- Non-associated Reciever
- ZVI Percentage of Project Visible
 - 0%
 - 0 - 25%
 - 25 - 50%
 - 50 - 75%
 - 75 - 100%

NOTE
ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. 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 the map is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.

Figure 09 – Zone of Visual Influence with Transmission Lines
Basemap Source: ARCGIS 2024, WINDPRO 2024



6.0 Viewpoint Analysis

6.1 Viewpoint Analysis Methodology

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 have been selected, panoramic photographs are taken on a level tripod at a height of 150cm (to represent eye level). Photographs are taken with a Canon EOS 5D Mark IV through a 50mm fixed focal 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 06**.

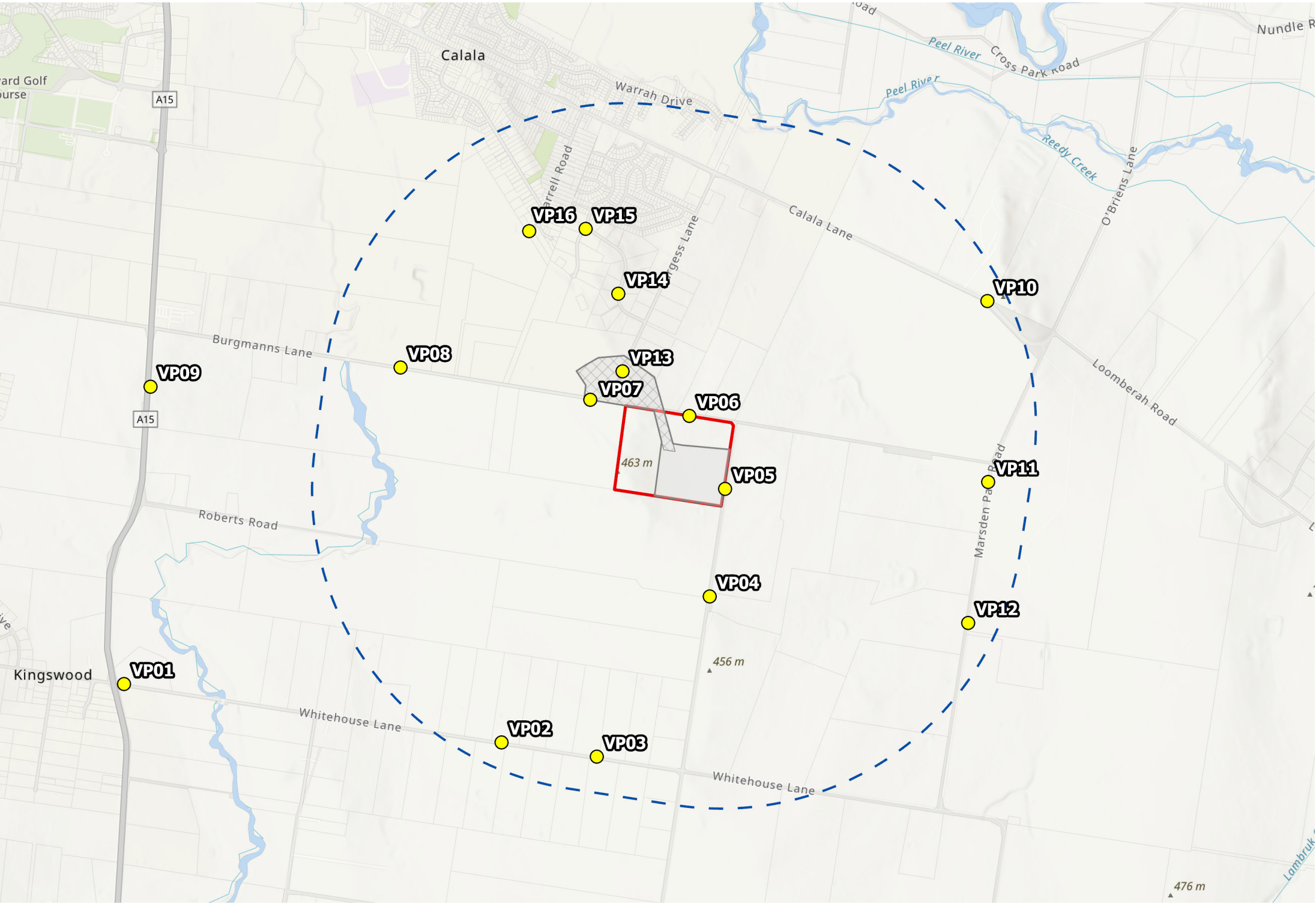
6.2 Viewpoint Selection Rationale

The locations of the viewpoints have been identified in **Figure 10**. Viewing direction of the viewpoints are noted on each viewpoint sheet. The selection of the viewpoints has been informed by topographical maps, the ZVI figure prepared for the Project, fieldwork observations and other relevant influences such as access, landscape character and the popularity of vantage points.

A total of 16 viewpoints were selected from publicly accessible locations to represent a range of views surrounding the Project.

Viewpoints are selected to illustrate a combination of the following:

- Areas of high landscape or scenic value
- Visual composition (eg. Focused or panoramic views, simple or complex landscape pattern)
- Range of distances
- Varying aspects
- Various elevations
- Various extent of development visibility (full and partial visibility)
- Views from major routes



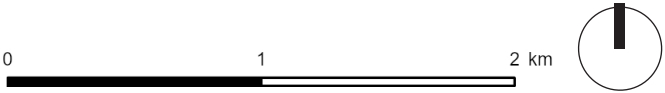
Viewpoint Locations

Refer to Section 6.3

LEGEND

- Project Site
- 2km Study Area
- Development Site
- Proposed Transmission Line Corridor
- Viewpoint Locations
- Lot
- Roads
- WaterFeature

Figure 10 – Viewpoint Locations
Basemap Source: ARCGIS 2024, SEED 2019



6.3 Viewpoint Analysis Methodology

As discussed in the rationale for the viewpoint selection process, these viewpoints are representative of the worst case scenario. For each viewpoint, the potential visual impacts are analysed through a combination of topographic maps and on site analysis. The visual sensitivity and visual magnitude of each viewpoint have been assessed which, when combined, results in an overall visual impact for the viewpoint (refer to **Table 06**). Of the 16 viewpoints assessed as part of this LVIA:

- Fourteen (14) viewpoints were assessed as having a very low visual impact.
- Two (2) viewpoints (VP05, VP06) were assessed as having a low visual impact rating.

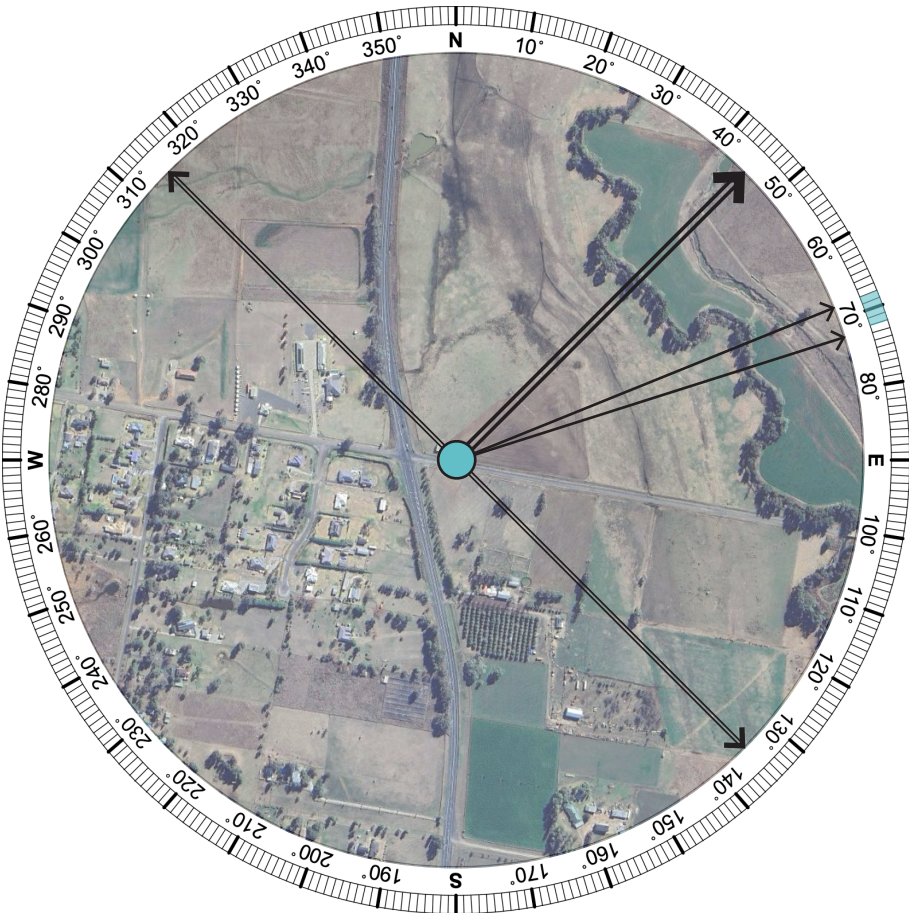
VIEWPOINT	LOCATION	VISUAL SENSITIVITY	VISUAL MAGNITUDE	POTENTIAL VISUAL IMPACT
VP01	Whitehouse Lane, Kingswood, NSW	VERY LOW	VERY LOW	VERY LOW
VP02	Whitehouse Lane, Kingswood, NSW	VERY LOW	VERY LOW	VERY LOW
VP03	Whitehouse Lane, Kingswood, NSW	VERY LOW	VERY LOW	VERY LOW
VP04	Ascot - Calala Road, Calala, NSW	VERY LOW	LOW	VERY LOW
VP05	Ascot - Calala Road, Calala, NSW	VERY LOW	MODERATE	LOW
VP06	Burgmanns Road, Kingswood, NSW	VERY LOW	MODERATE	LOW
VP07	Burgmanns Road, Kingswood, NSW	VERY LOW	LOW	LOW
VP08	Burgmanns Road, Kingswood, NSW	VERY LOW	LOW	LOW
VP09	New England Highway, Kingswood, NSW	VERY LOW	LOW	LOW
VP10	Calala Lane, Calala, NSW	VERY LOW	LOW	VERY LOW
VP11	Marsden Park Road, Calala, NSW	VERY LOW	LOW	VERY LOW
VP12	Marsden Park Road, Calala, NSW	VERY LOW	LOW	VERY LOW
VP13	Burgess Lane, Calala, NSW	VERY LOW	VERY LOW	VERY LOW
VP14	Pinstripe Road, Calala, NSW	VERY LOW	VERY LOW	VERY LOW
VP15	Whipbird Street, Calala, NSW	VERY LOW	VERY LOW	VERY LOW
VP16	Darrell Road, Calala, NSW	VERY LOW	VERY LOW	VERY LOW

Table 06 – Visual Impact Ratings Results
Note these ratings are based on the visibility assessment criteria outlined in the Study Method of this VIA report.

Viewpoint:
VP01 Whitehouse Lane, Kingswood, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP01

Viewpoint Summary:

Location:	Elevation:
Whitehouse Lane, Kingswood, NSW	783 m
Coordinates:	Distance to Project:
31°09'57.19"S 150°55'12.54"E	3.71 km
Viewing Direction:	
Northeast	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
VERY LOW	
Visual Impact:	
VERY LOW	

Existing Landscape Character Description:

The viewpoint was taken at Whitehouse Lane, a local sealed road just off the New England Highway.

The topography is gently undulating, with the vegetated ranges of the New England Tablelands visible to the far northeast.

The land surrounding the viewpoint is used for agricultural production and grazing, with a small line of vegetation following a creekline towards the northeast partially screening views.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 1-25% from this location. (Based on 5m ZVI)

From this location, intervening vegetation will likely partially screen views of the Project. In addition, the large distance to the Project (3.71 km), results in a small portion of the view impacted by the Project.

Thus, the visual magnitude of change is **VERY LOW** resulting in a **VERY LOW** visual impact.

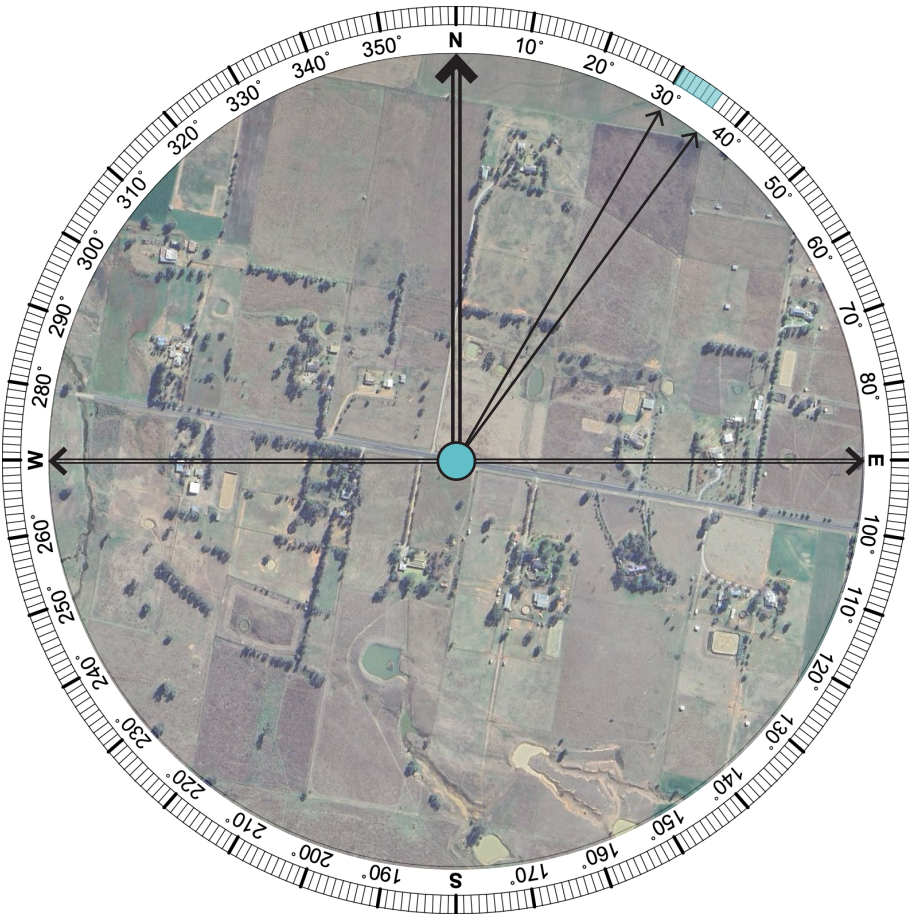
LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP02 Whitehouse Lane, Kingswood, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP02

Viewpoint Summary:

Location:	Elevation:
Whitehouse Lane, Kingswood, NSW	415 m
Coordinates:	Distance to Project:
31°10'11.24"S 150°56'46.46"E	1.94 km
Viewing Direction:	
North	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
VERY LOW	
Visual Impact:	
VERY LOW	

Existing Landscape Character Description:

The viewpoint was taken at Whitehouse Lane, a local sealed road that connects local residences to the New England Highway.

The topography is gently undulating, with the vegetated ranges of the New England Tablelands visible to the far north and northeast.

The surrounding landuse is agricultural and predominately used for grazing.

Windbreaks of scattered vegetation partially screen views towards the far north, east and northwest.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 1-25% from this location. (Based on 5m ZVI)

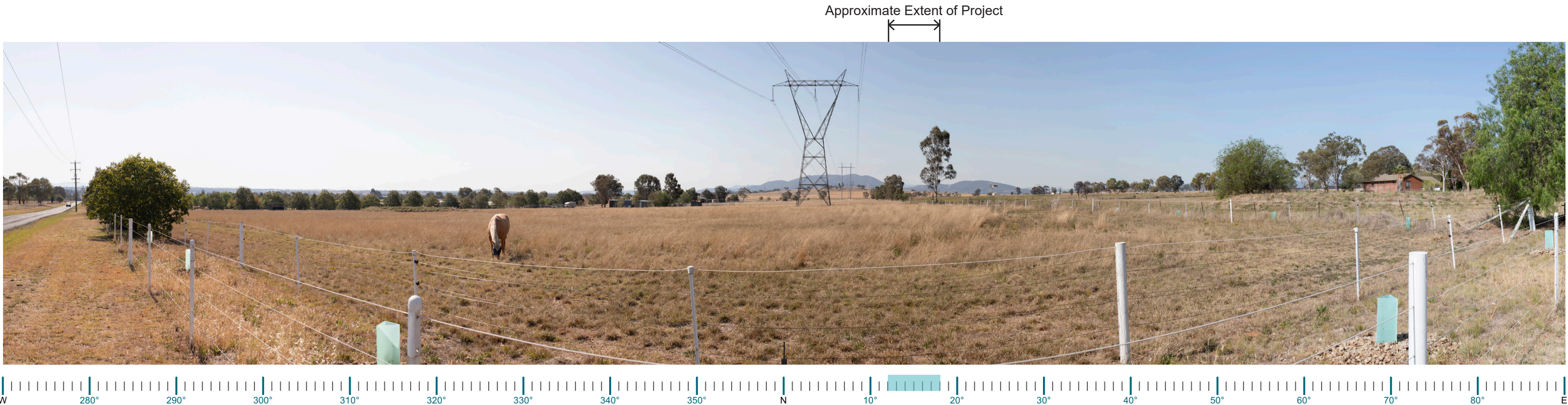
Additionally, from this location, intervening vegetation will likely screen views of the Project.

Therefore, the visual magnitude of change is **VERY LOW** resulting in a **VERY LOW** visual impact.

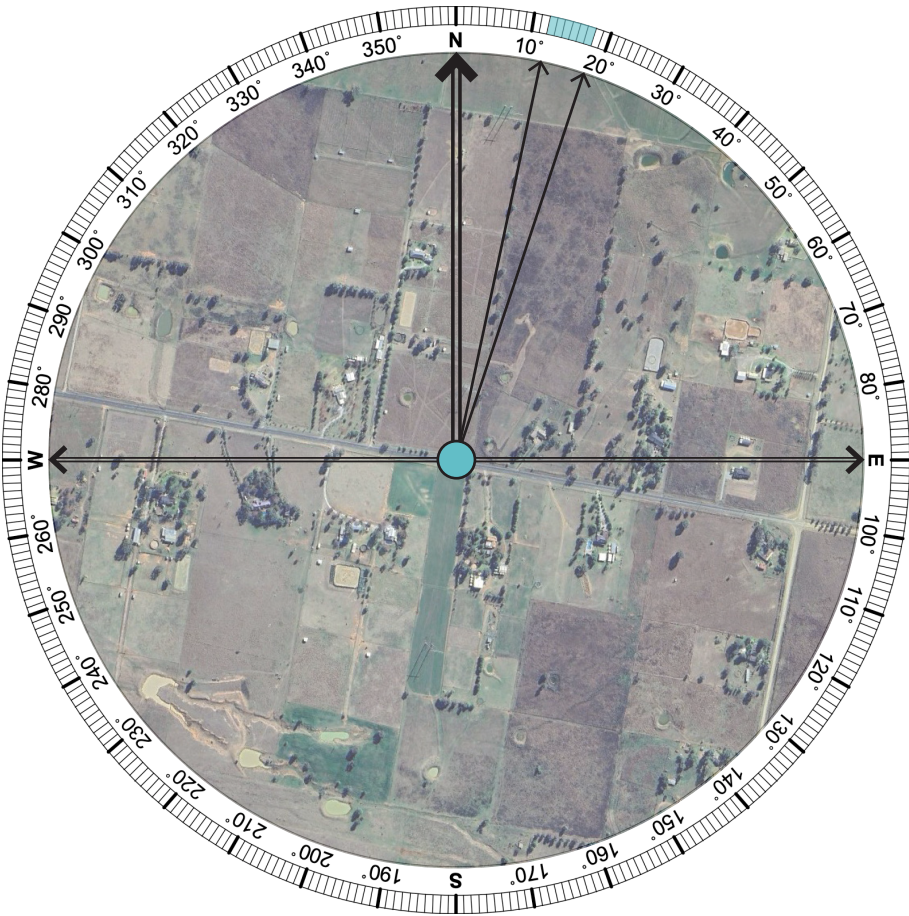
LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP03 Whitehouse Lane, Kingswood, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP03

Viewpoint Summary:

Location:	Elevation:
Whitehouse Lane, Kingswood, NSW	431 m
Coordinates:	Distance to Project:
31°10'14.68"S 150°57'10.15"E	1.80 km
Viewing Direction:	
North	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
LOW	
Visual Impact:	
VERY LOW	

LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Existing Landscape Character Description:

The viewpoint was taken from Whitehouse Lane, a local sealed road that connects local residences to the New England Highway.

The landscape is characterised by undulating land cleared for farming, broken up by scattered windbreaks of vegetation and powerline infrastructure.

The topography is gently undulating, with the vegetated ranges of the New England Tablelands visible to the far north and northeast.

The surrounding landuse is agricultural and predominately used for grazing.

Scattered windbreaks of vegetation can be seen, partially screening views towards the far northwest, north, and northeast.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

However, from this location, intervening vegetation will likely partially screen views of the Project. Additionally, transmission lines are already a dominant visual characteristic of the landscape. Therefore, any views available will likely be viewed as part of the existing power infrastructure.

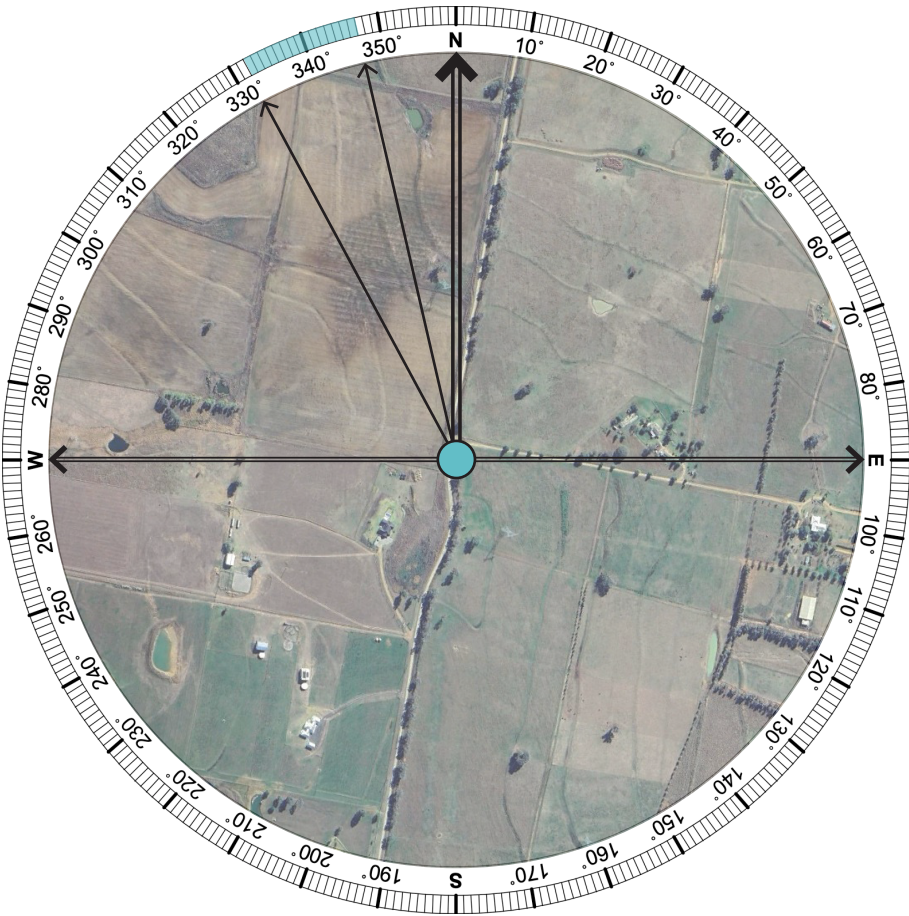
The visual magnitude of change is **VERY LOW**, resulting in a **VERY LOW** visual impact.

Viewpoint:
VP04 Ascot - Calala Road, Calala, NSW

Approximate Extent of Project



Extent of Potential Visibility



VIEWPOINT VP04

Viewpoint Summary:

Location:	Elevation:
Ascot - Calala Road, Calala, NSW	444 m
Coordinates:	Distance to Project:
31°09'40.74"S 150°57'39.10"E	0.71 km

Viewing Direction:

North

Visual Sensitivity:

Very Low

Visual Magnitude:

Low

Visual Impact:

Very Low

Existing Landscape Character Description:

The viewpoint was taken from Ascot - Calala Road, a local unsealed road used by nearby residences.

The landscape is characterised by undulating land cleared for farming, broken up by scattered windbreaks of vegetation and powerline infrastructure.

The topography is gently undulating, falling away from the location to show open views of the surrounding landscape. The vegetated ranges of the New England Tablelands are visible to the far north and northeast.

The surrounding landuse is agricultural and predominately used for grazing.

Vegetation is limited, with scattered trees towards the far northeast and north.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

However, Tamworth substation and its associated infrastructure are an existing dominant visual characteristic of the landscape. Therefore, any views available will likely be viewed as part of the existing power infrastructure.

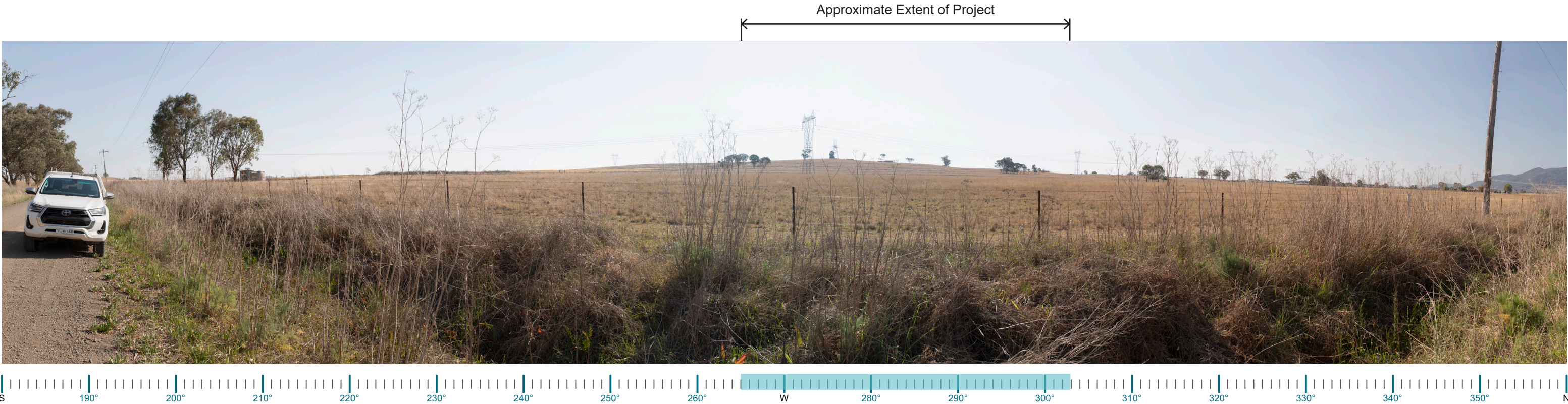
The visual magnitude of change is **Low**, resulting in a **VERY LOW** visual impact.

LEGEND

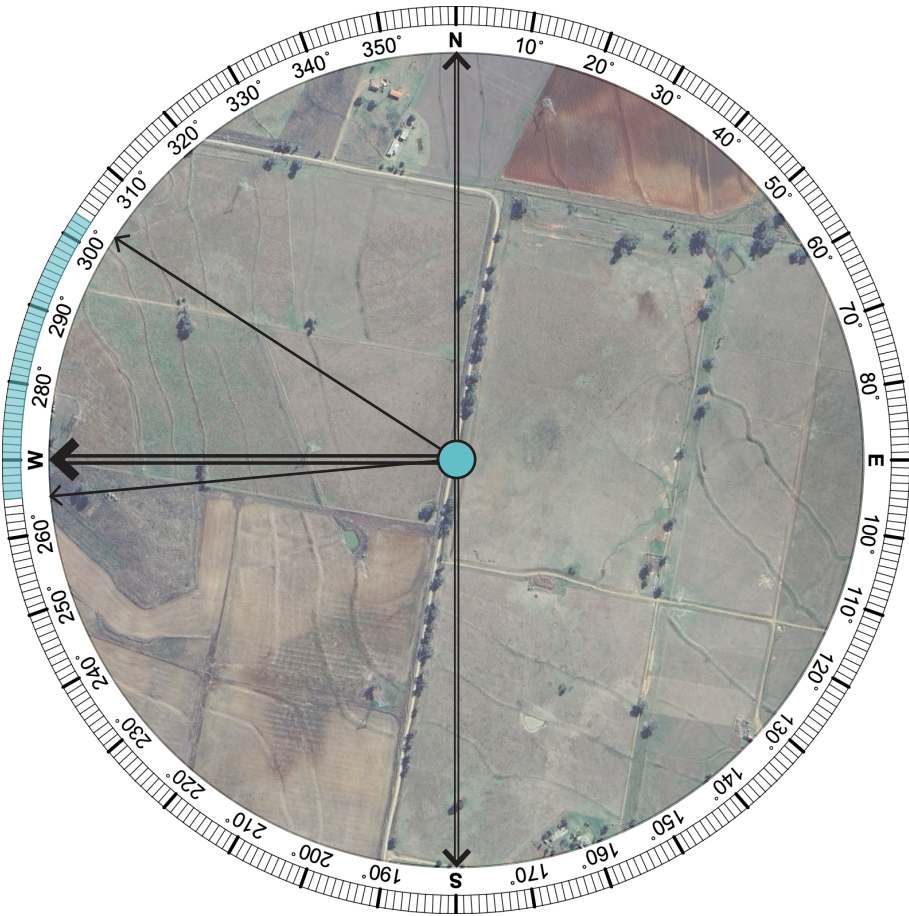
- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Aerial Source: Google Earth, 2023

Viewpoint:
VP05 Ascot - Calala Road, Calala, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP05

Viewpoint Summary:

Location:	Elevation:
Ascot - Calala Road, Calala, NSW	429 m
Coordinates:	Distance to Project:
31°09'17.69"S 150°57'43.50"E	0.31 km
Viewing Direction:	
West	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
MODERATE	
Visual Impact:	
LOW	

LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Existing Landscape Character Description:

The viewpoint was taken from Ascot - Calala Road, a local unsealed road used by nearby residences.

The landscape is characterised by undulating land cleared for farming, broken up by scattered trees and powerline infrastructure.

The topography is undulating, with the landform gently sloping up from the location to show a high point far west. The landform gradually slopes down towards the north, with vegetated ranges of the New England Tablelands visible to the far north.

The surrounding landuse is agricultural and predominately used for grazing.

Limited vegetation is visible, with scattered trees dispersed through the surrounding paddocks to the far west, and lining the road to the south.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

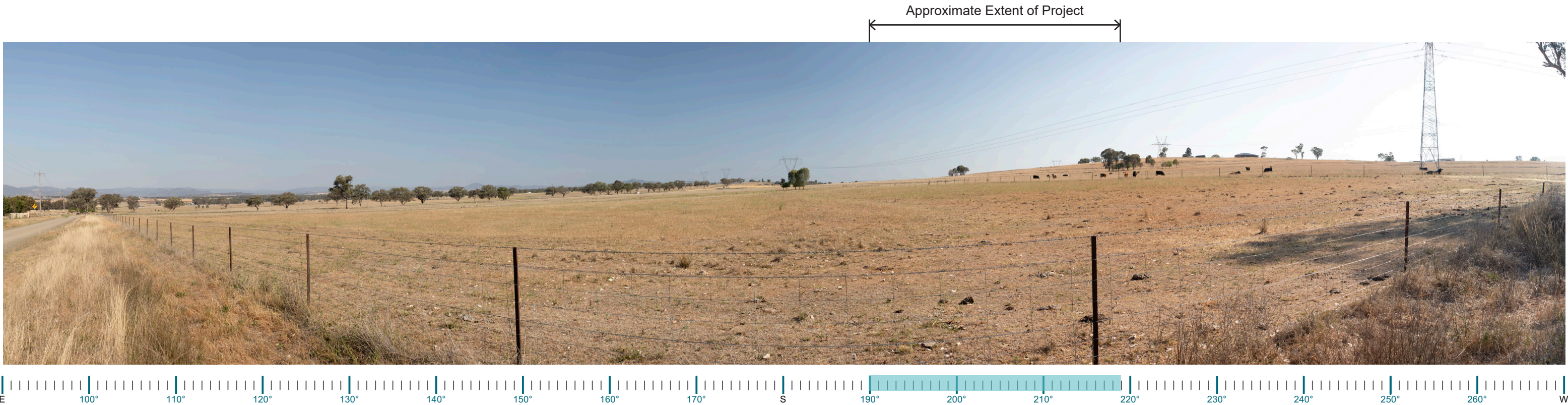
Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

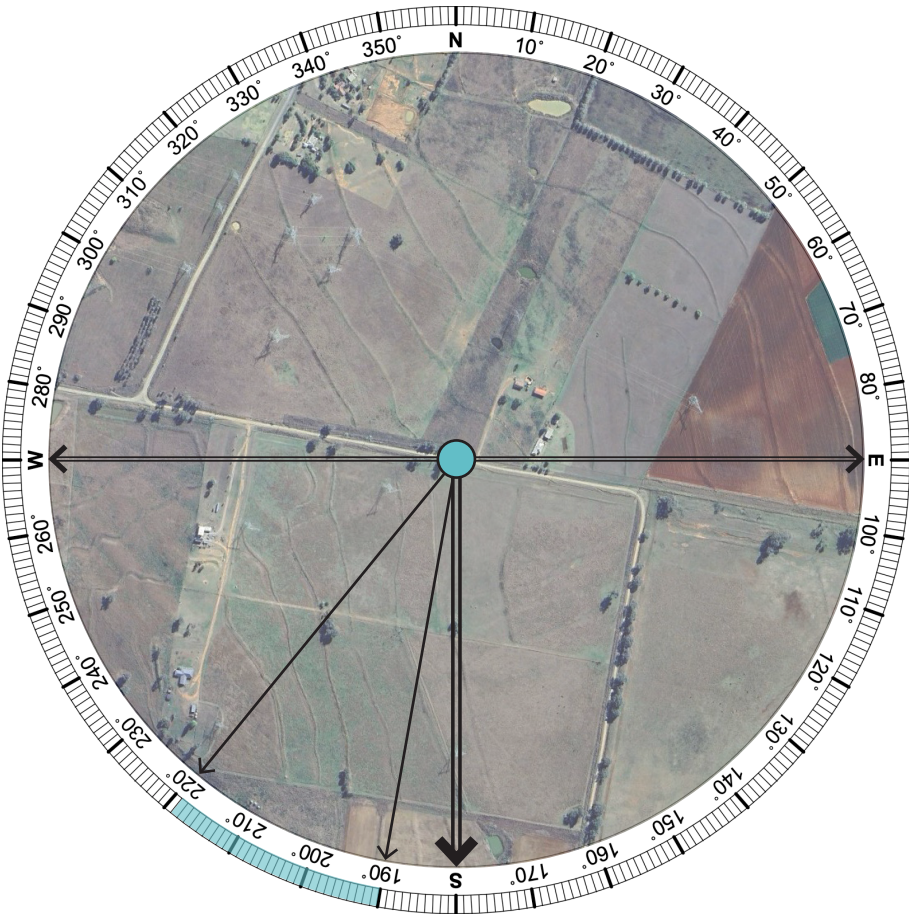
However, Tamworth substation and its associated infrastructure are an existing visual characteristic of the landscape. Therefore, any views available will not significantly alter the existing character of the landscape.

The visual magnitude of change is **MODERATE**, resulting in a **LOW** visual impact.

Viewpoint:
VP06 Burgmanns Road, Kingswood, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP06

Viewpoint Summary:		Existing Landscape Character Description:	Potential Visual Impact:
Location:	Elevation:	The viewpoint was taken from Burgmanns Road, a local unsealed road used by nearby residences.	An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)
Burgmanns Road, Kingswood, NSW	431 m		
Coordinates:	Distance to Project:	The landscape is characterised by undulating land cleared for farming, broken up by scattered trees and powerline infrastructure.	However, transmission line infrastructure is an existing visual characteristic of the landscape. Therefore, any views available will not significantly alter the existing character of the landscape.
31°09'1.86"S 150°57'34.86"E	0.29 km		
Viewing Direction:		The topography is undulating, with a high point to the southwest sloping down to reveal open views towards the east. Vegetated ranges of the New England Tablelands are visible to the far east.	The visual magnitude of change is MODERATE , resulting in a LOW visual impact.
South			
Visual Sensitivity:		The surrounding landuse is agricultural and predominately used for grazing.	
VERY LOW			
Visual Magnitude:		Vegetation is scattered, with trees dispersed through the surrounding paddocks to the far southwest, and southeast.	
MODERATE			
Visual Impact:		The visual sensitivity of this viewpoint has been rated as VERY LOW .	
LOW			

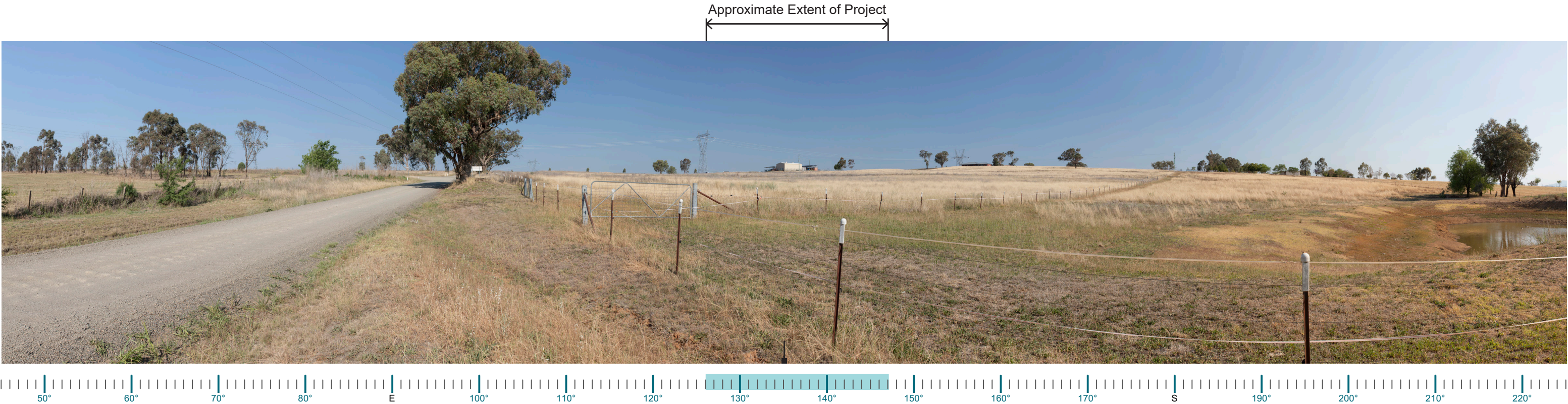
LEGEND

➡ Direction of Panorama

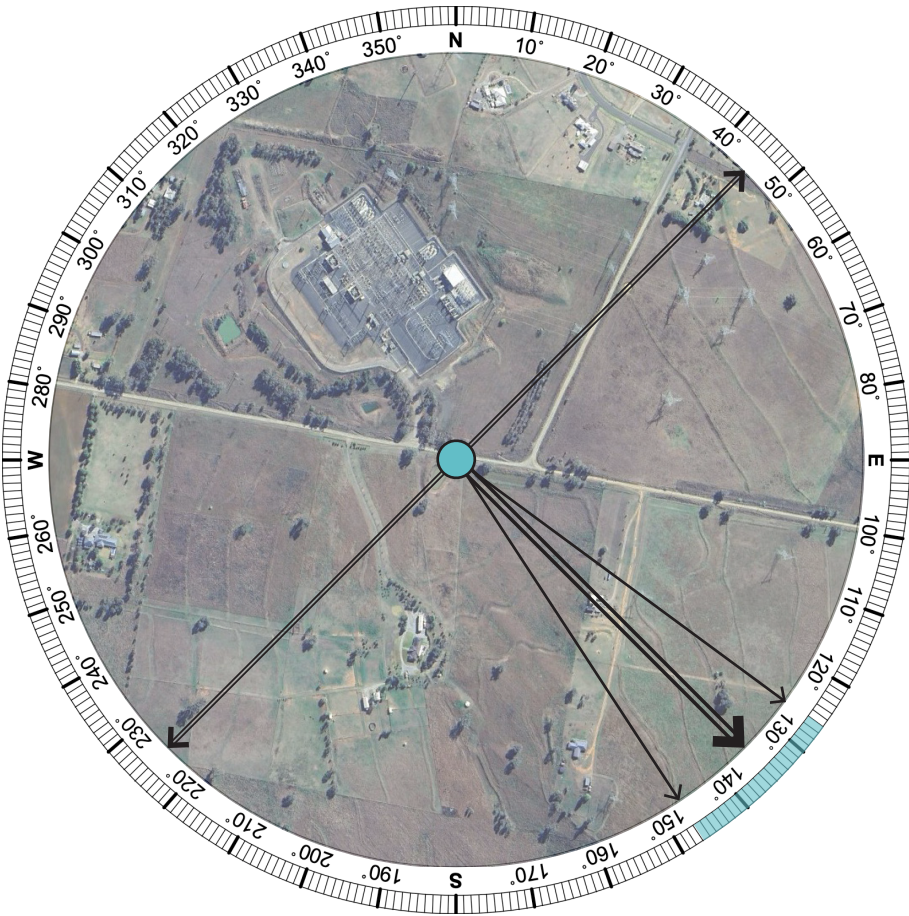
➡ Extent of Panorama

➡ Approximate Extent of Project

Viewpoint:
VP07 Burgmanns Road, Kingswood, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP07

Viewpoint Summary:

Location:	Elevation:
Burgmanns Road, Kingswood, NSW	432 m
Coordinates:	Distance to Project:
31°08'58.03"S 150°57'10.26"E	0.58 km
Viewing Direction:	
Southeast	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
NIL	
Visual Impact:	
NIL	

Existing Landscape Character Description:

The viewpoint was taken from Burgmanns Road, a local unsealed road used by nearby residences.

The landscape is characterised by undulating land cleared for farming, broken up by scattered trees and powerline infrastructure to the southeast.

The topography is undulating, with the land rising from the location to contain the surrounding views.

The surrounding landuse is agricultural and predominately used for grazing.

Vegetation is limited, with scattered trees dispersed through the surrounding paddocks to the far south, and lining the road to the east.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will not be visible from this location. (Based on 5m ZVI).

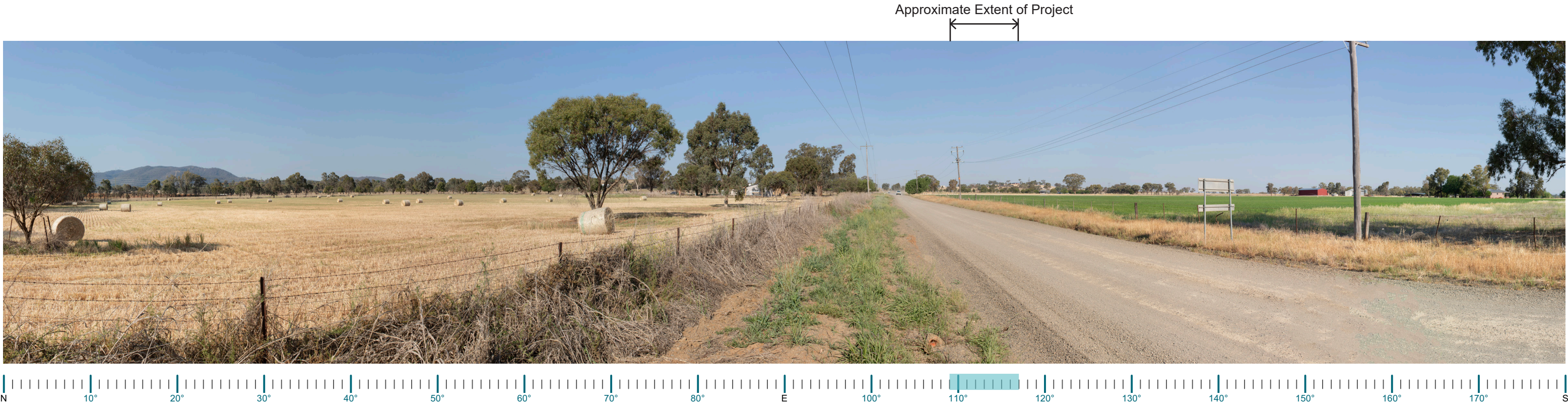
Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing transmission line infrastructure, the visual impact to the landscape character will be negligible.

Therefore, the visual magnitude of change is **NIL**, resulting in a **NIL** visual impact.

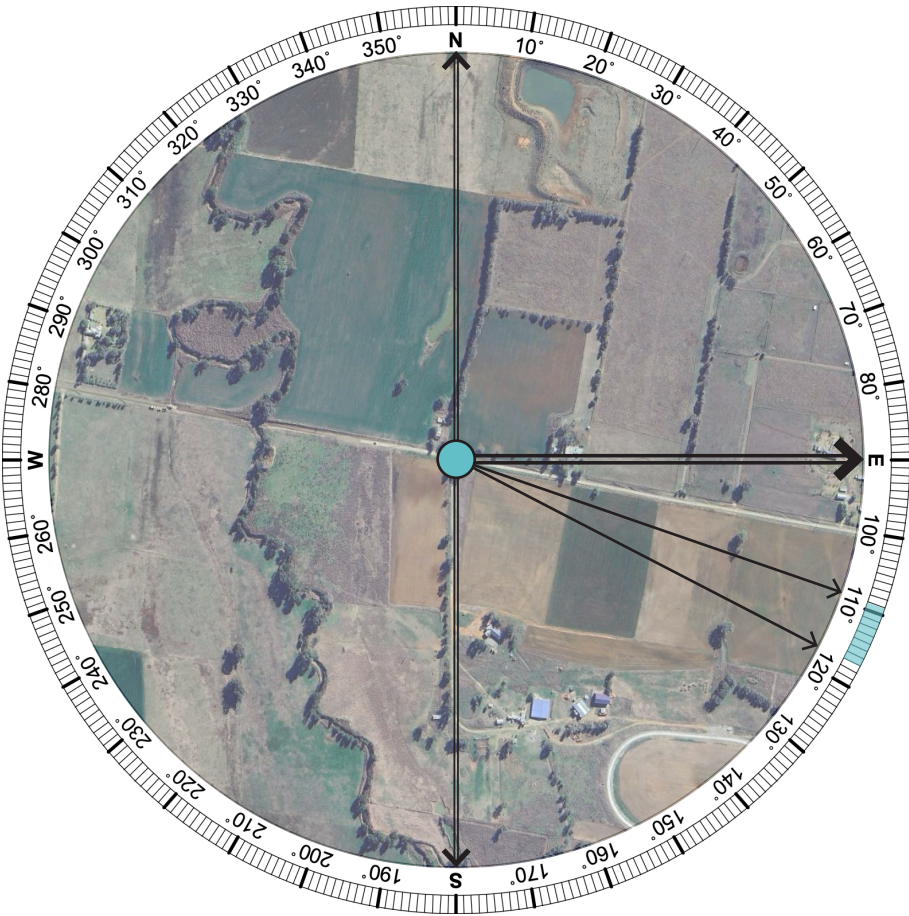
LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP08 Burgmanns Road, Kingswood, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP08

Viewpoint Summary:

Location:	Elevation:
Burgmanns Road, Kingswood, NSW	393 m
Coordinates:	Distance to Project:
31°08'50.32"S 150°56'23.01"E	1.81 km
Viewing Direction:	
East	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
NIL	
Visual Impact:	
NIL	

Existing Landscape Character Description:

The viewpoint was taken from Burgmanns Road, a local unsealed road that connects surrounding residences to the New England Highway.

The landscape is characterised by undulating cleared farmland, broken up by scattered vegetation and powerline infrastructure.

The topography is gently undulating, with open views revealing vegetated ranges of the New England Tablelands towards the northeast.

The surrounding landuse is agricultural, utilised for both cropping and grazing.

Scattered vegetation towards the far southeast and northeast filter some of the view beyond. Scattered trees towards the east closer to the viewpoint filter views towards the east.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will not be visible from this location. (Based on 5m ZVI)

Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing screening vegetation and transmission line infrastructure, the visual impact to the landscape character will be negligible.

Therefore, the visual magnitude of change is **NIL**, resulting in a **NIL** visual impact.

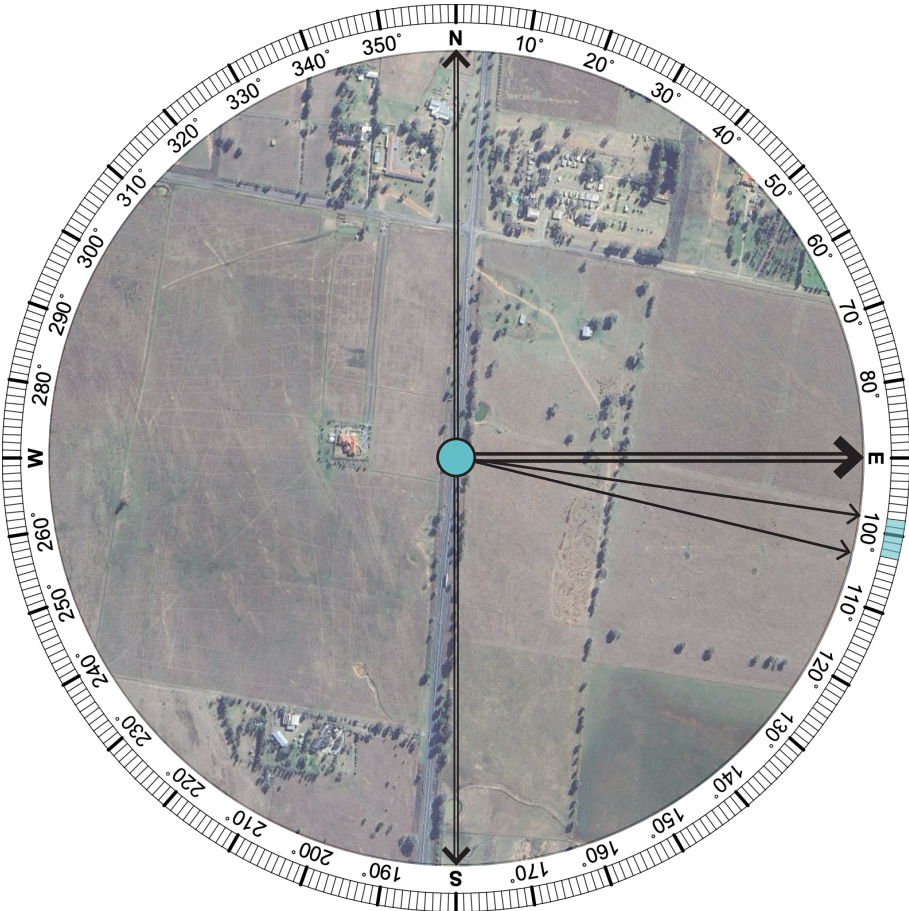
- LEGEND**
- ➡ Direction of Panorama
 - ➡ Extent of Panorama
 - ➡ Approximate Extent of Project

Viewpoint:
VP09 New England Highway, Kingswood, NSW

Approximate Extent of Project



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP09

Viewpoint Summary:

Location:	Elevation:
New England Highway, Kingswood, NSW	421 m
Coordinates:	Distance to Project:
31°08'53.44"S 150°55'20.49"E	3.37 km
Viewing Direction:	
East	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
NIL	
Visual Impact:	
NIL	

Existing Landscape Character Description:

The viewpoint was taken off the New England Highway, a key inland road that connects Sydney and Brisbane.

The landscape is characterised by open views of undulating, cleared farmland, with vegetated ranges of the New England Tablelands visible in the far distance.

The topography is gently undulating, with the viewpoint taken at a high elevation to reveal open views of rolling pastures.

The surrounding landuse is agricultural, predominately utilised for grazing.

Vegetation is scattered, with dispersed groups of trees in paddocks and thin lines of windbreaks visible in the far-ground.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will not be visible from this location. (Based on 5m ZVI)

Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing transmission line infrastructure, the visual impact to the landscape character will be negligible.

Therefore, the visual magnitude of change is **NIL**, resulting in a **NIL** visual impact.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

LEGEND

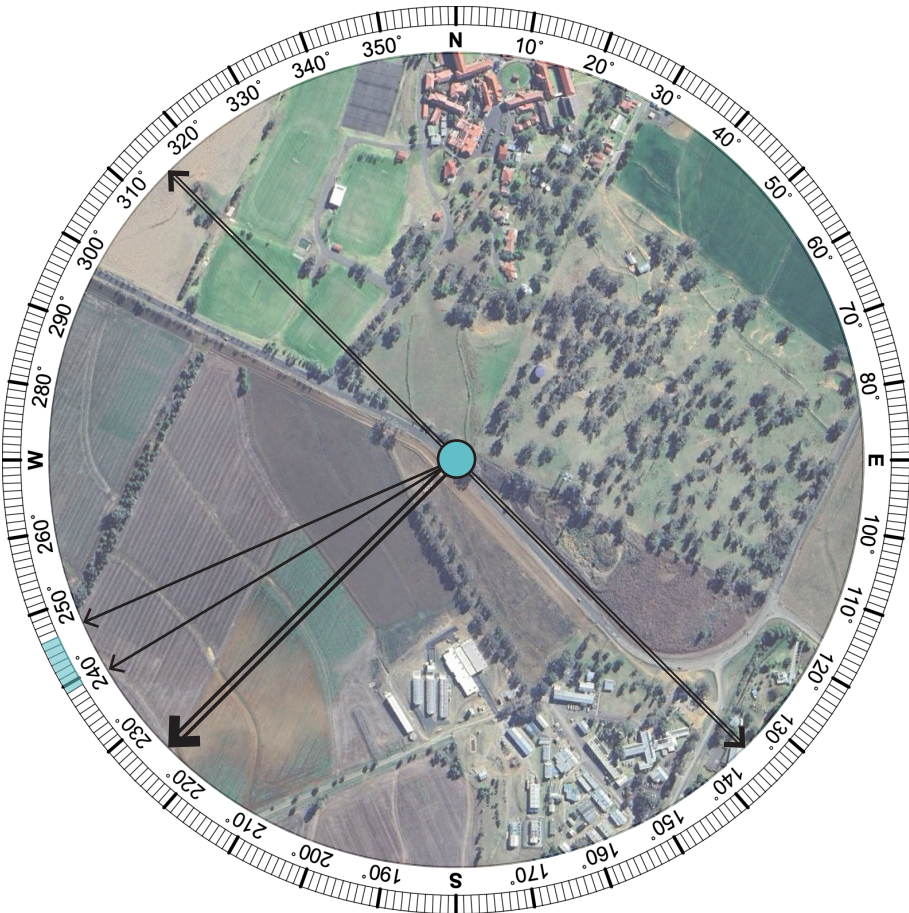
- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP10 Calala Lane, Calala, NSW

Approximate Extent of Project



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP10

Viewpoint Summary:

Location:	Elevation:
Calala Lane, Calala, NSW	436 m
Coordinates:	Distance to Project:
31°08'38.43"S 150°58'49.75"E	2.33 km

Viewing Direction:

Southwest

Visual Sensitivity:

VERY LOW

Visual Magnitude:

LOW

Visual Impact:

VERY LOW

Existing Landscape Character Description:

The viewpoint was taken from Calala Lane, a local sealed road that connects the suburb of Calala to the surrounding area.

The landscape is characterised by open, rolling pastures of cleared farmland, broken up by scattered trees.

The topography is undulating, with the landform sloping down and away from the viewpoint to show open views towards the southwest. The land rises towards the southeast, containing views in that direction.

The surrounding landuse is agricultural and predominately utilised for grazing. The suburb of Calala and powerline infrastructure associated with Tamworth substation are visible to the far west.

Intervening windbreak vegetation combined with scattered vegetation in the background fragments views towards the Project.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

From this location, intervening vegetation will likely partially screen views of the Project. Additionally, the large distance to the Project (2.33 km), results in a small portion of the view impacted by the Project.

Transmission line infrastructure is an existing visual characteristic of the landscape. Therefore, any views available will not significantly alter the existing character of the landscape.

The visual magnitude of change is **LOW**, resulting in a **VERY LOW** visual impact.

LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP11 Marsden Park Road, Calala, NSW

Approximate Extent of Project



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP11

Viewpoint Summary:

Location:	Elevation:
Marsden Park Road, Calala, NSW	419 m
Coordinates:	Distance to Project:
31°09'17.29"S 150°58'49.17"E	2.04 km

Viewing Direction:

West

Visual Sensitivity:

VERY LOW

Visual Magnitude:

LOW

Visual Impact:

VERY LOW

Existing Landscape Character Description:

The viewpoint was taken from Marsden Park Road, a local unsealed road used by nearby residences.

The landscape is characterised by gently undulating cleared farmland broken up by scattered vegetation. The landform slopes gently down and away from the viewpoint, providing open views towards the west. Vegetated ranges of the New England Tablelands are visible to the far north.

The surrounding landuse is agricultural, predominately utilised for grazing.

High voltage transmission lines are visible to the far west.

Vegetation is scattered, with dispersed groups of trees in paddocks and thin lines of windbreaks visible in the far-ground.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

From this location, intervening vegetation will likely partially screen views of the Project. Additionally, the large distance to the Project (2.04 km), results in a small portion of the view impacted by the Project.

The visual magnitude of change is **LOW**, resulting in a **VERY LOW** visual impact.

LEGEND

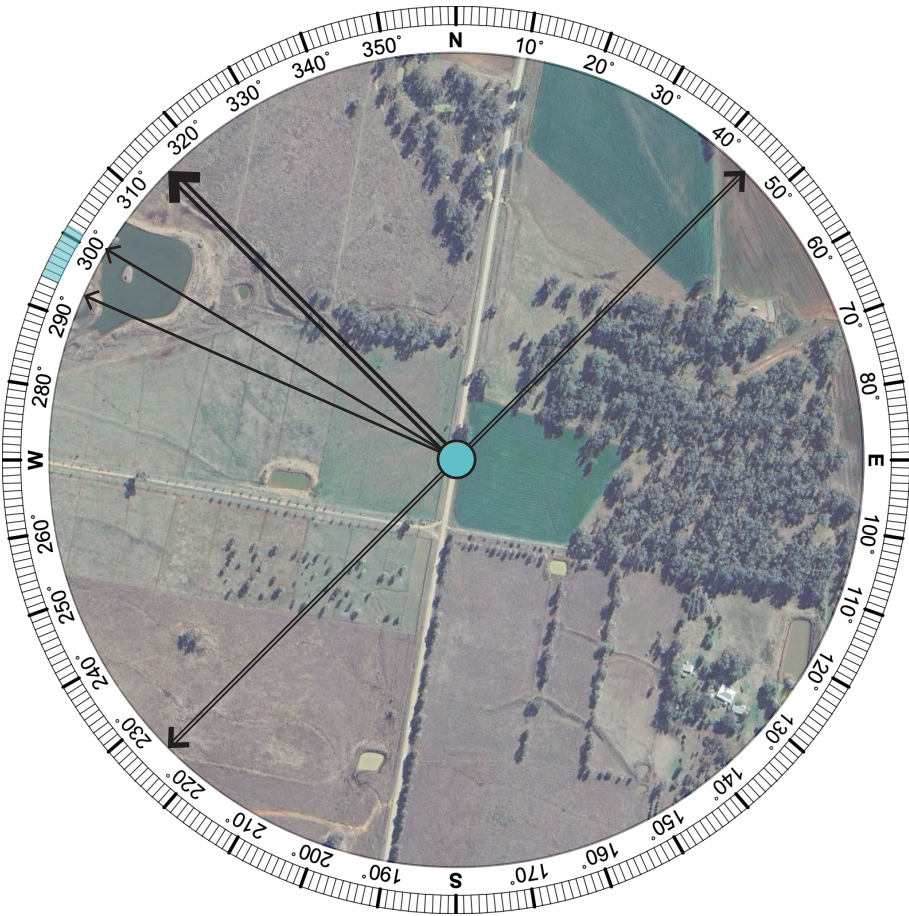
- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP12 Marsden Park Road, Calala, NSW

Approximate Extent of Project



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP12

Viewpoint Summary:

Location:	Elevation:
Marsden Park Road, Calala, NSW	417 m
Coordinates:	Distance to Project:
31°09'47.40"S 150°58'43.57"E	2.10 km

Viewing Direction:
Northwest

Visual Sensitivity:
VERY LOW

Visual Magnitude:
LOW

Visual Impact:
VERY LOW

Existing Landscape Character Description:

The viewpoint was taken from Marsden Park Road, a local unsealed road used by nearby residences.

The landscape is characterised by gently undulating cleared farmland broken up by scattered vegetation. Vegetated ranges of the New England Tablelands are partially visible through vegetation to the far north.

The surrounding landuse is agricultural, predominately utilised for grazing.

Existing powerline, fencing and roads are evident as introduced infrastructure in the landscape.

Vegetation is scattered, with dispersed groups of trees in paddocks and thin lines of windbreaks visible in the far-ground. A clump of vegetation to the north partially screens views in that direction.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

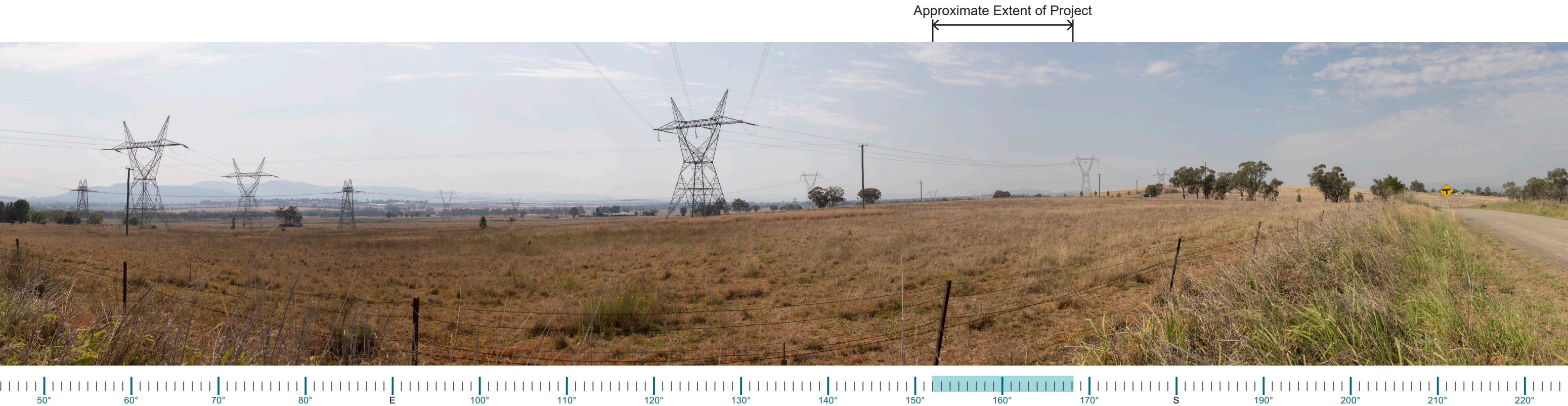
An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

From this location, intervening vegetation will likely screen views of the Project. Additionally, the large distance to the Project (2.10 km), results in a small portion of the view impacted by the Project.

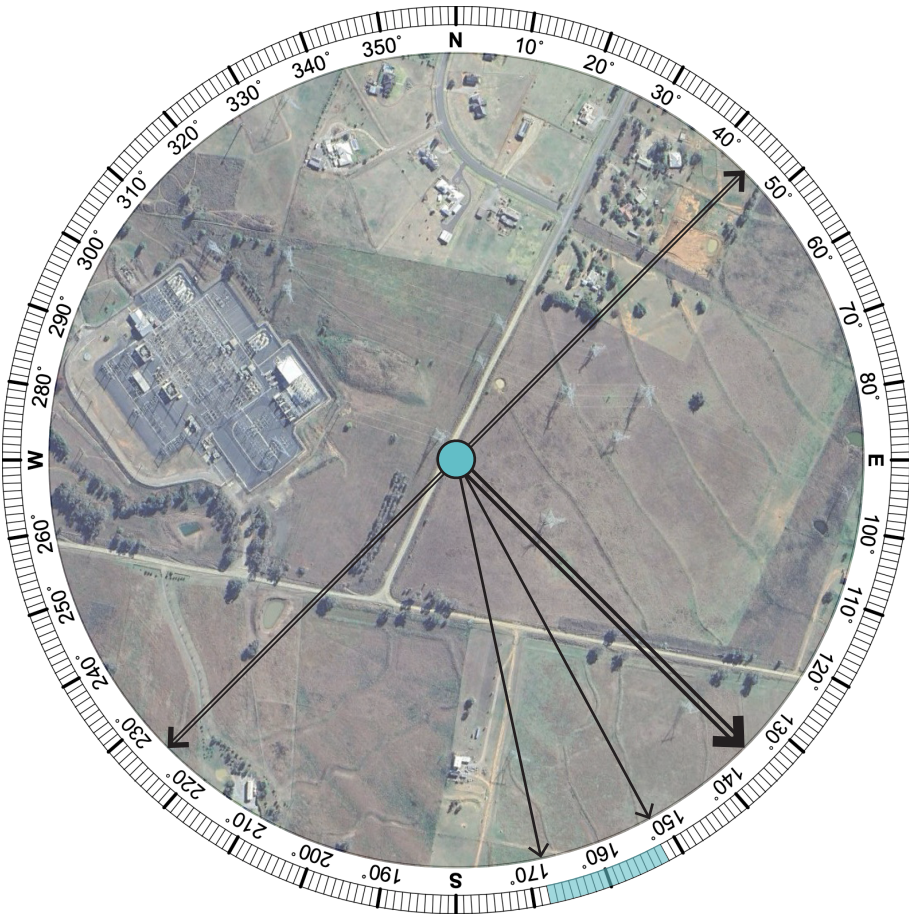
The visual magnitude of change is **LOW**, resulting in a **VERY LOW** visual impact.

- LEGEND**
- ➡ Direction of Panorama
 - ➡ Extent of Panorama
 - ➡ Approximate Extent of Project

Viewpoint:
VP13 Burgess Lane, Calala, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP13

Viewpoint Summary:

Location:	Elevation:
Burgess Lane, Calala, NSW	443 m
Coordinates:	Distance to Project:
31°08'52.09"S 150°57'18.42"E	0.59 km
Viewing Direction:	
Southeast	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
VERY LOW	
Visual Impact:	
VERY LOW	

Existing Landscape Character Description:

The viewpoint was taken from Burgess Lane, a local unsealed road that connects surrounding residences to the suburb of Calala.

The landscape is characterised by rolling pastures of cleared farmland, with a prevalence of powerline infrastructure overhead.

The topography is gently undulating, sloping down and away from the viewpoint to reveal open views and vegetated ranges towards the far east.

Vegetation is limited, with lone trees dispersed through the pastures.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 25-50% from this location. (Based on 5m ZVI)

From this location, intervening vegetation and topography will likely screen views of the Project. Additionally, transmission line infrastructure is a dominant visual characteristic of the landscape. Therefore, any views available will not significantly alter the existing character of the landscape.

Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing transmission line infrastructure, the visual impact to the landscape character will be negligible.

The visual magnitude of change is **VERY LOW**, resulting in a **VERY LOW** visual impact.

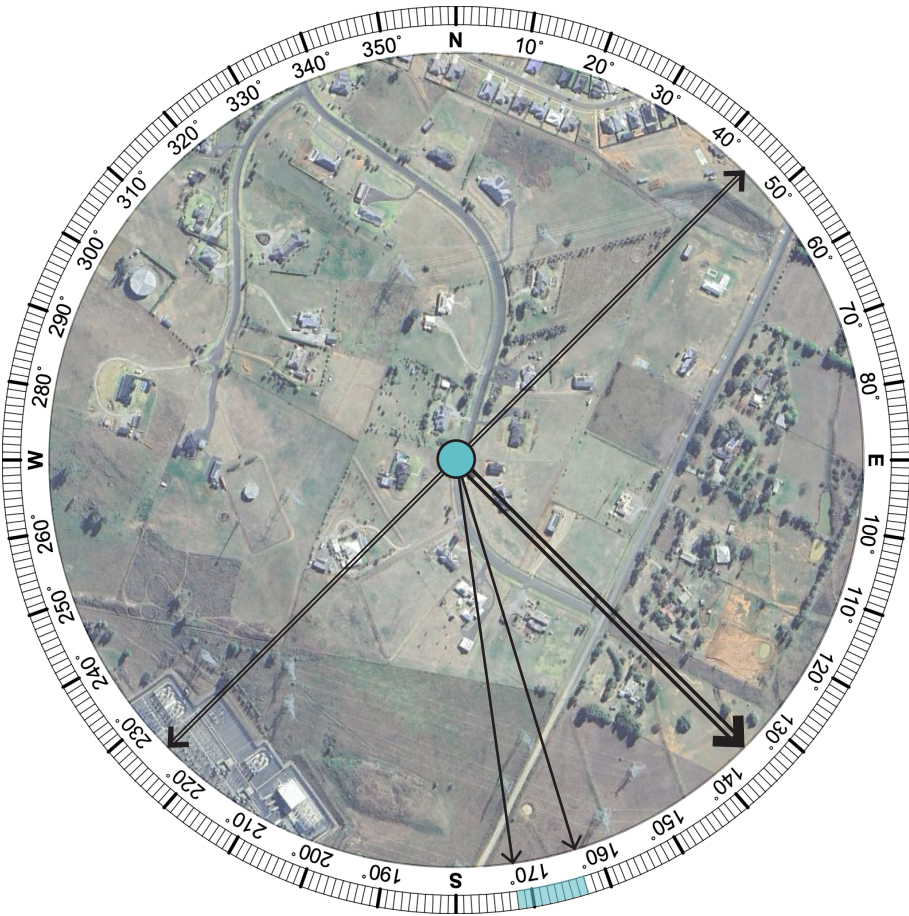
LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP14 Pinstripe Road, Calala, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP14

Viewpoint Summary:

Location:	Elevation:
Pinstripe Road, Calala, NSW	440 m
Coordinates:	Distance to Project:
31°08'35.37"S 150°57'17.68"E	1.09 km
Viewing Direction:	
Southeast	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
VERY LOW	
Visual Impact:	
VERY LOW	

LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Existing Landscape Character Description:

The viewpoint was taken from Pinstripe Road, a local sealed road used by nearby Calala residences.

The surrounding land has been modified for residential developments, with fencing and transmission infrastructure prominent in views towards the far southwest and northwest.

The topography is undulating, with a high point towards the south containing views in that direction. The landform gradually slopes down towards the east, revealing open views of the New England Tableland vegetated ranges.

Vegetation is scattered, with a trees in the foreground towards the southeast screening a portion of the view.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will have a potential visibility of 75-100% from this location. (Based on 5m ZVI)

From this location, intervening vegetation and structures will likely screen views of the Project. Additionally, transmission line infrastructure is a dominant visual characteristic of the landscape. Therefore, any views available will not significantly alter the existing character of the landscape.

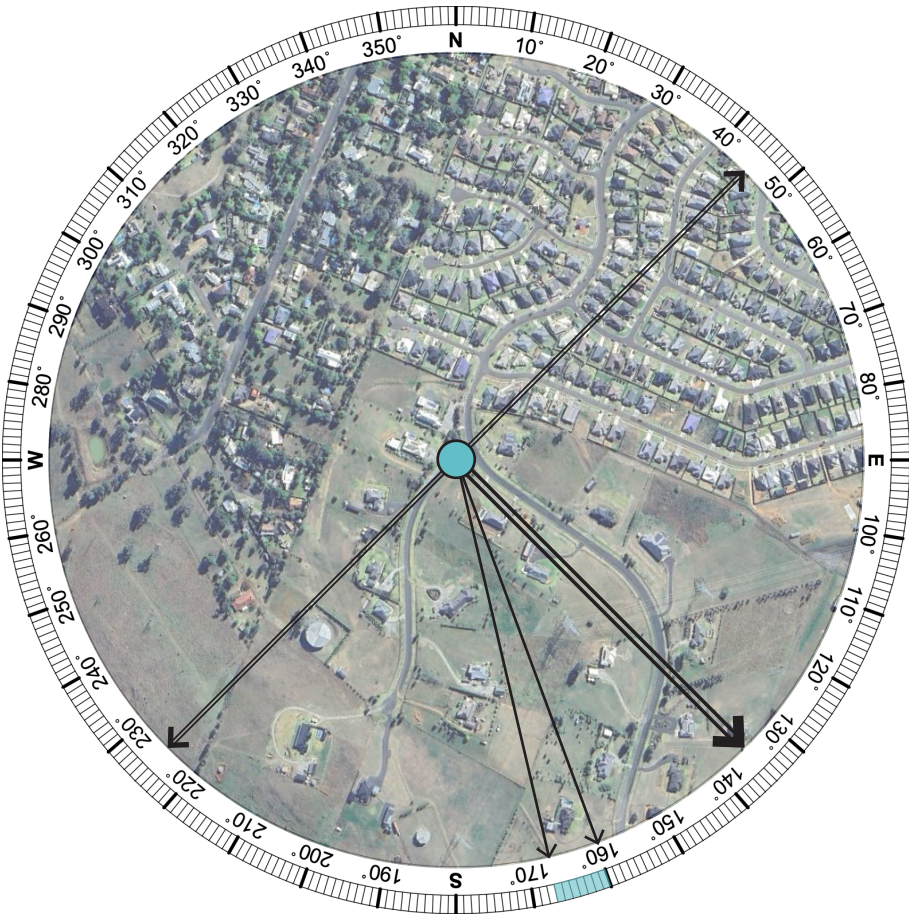
Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing transmission line infrastructure, the visual impact to the landscape character will be negligible.

The visual magnitude of change is **VERY LOW**, resulting in a **VERY LOW** visual impact.

Viewpoint:
VP15 Whipbird Street, Calala, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP15

Viewpoint Summary:

Location:	Elevation:
Whipbird Street, Calala, NSW	438 m
Coordinates:	Distance to Project:
31°08'21.36"S 150°57'9.87"E	1.56 km
Viewing Direction:	
Southeast	
Visual Sensitivity:	
VERY LOW	
Visual Magnitude:	
VERY LOW	
Visual Impact:	
VERY LOW	

Existing Landscape Character Description:

The viewpoint was taken from Whipbird Street, a local sealed road used by nearby Calala residences.

The surrounding land has been modified for residential developments, with fencing and transmission infrastructure prominent in view, particularly towards the southeast.

The surrounding topography is undulating, with a sharp incline to the south west containing views in that direction. The land slopes down towards the northeast, revealing distant views of the New England Tableland vegetated ranges .

Vegetation is scattered, with young trees dispersed along roads and in gardens.

High voltage transmission lines are visible to the southeast.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will not be visible from this location. (Based on 5m ZVI)

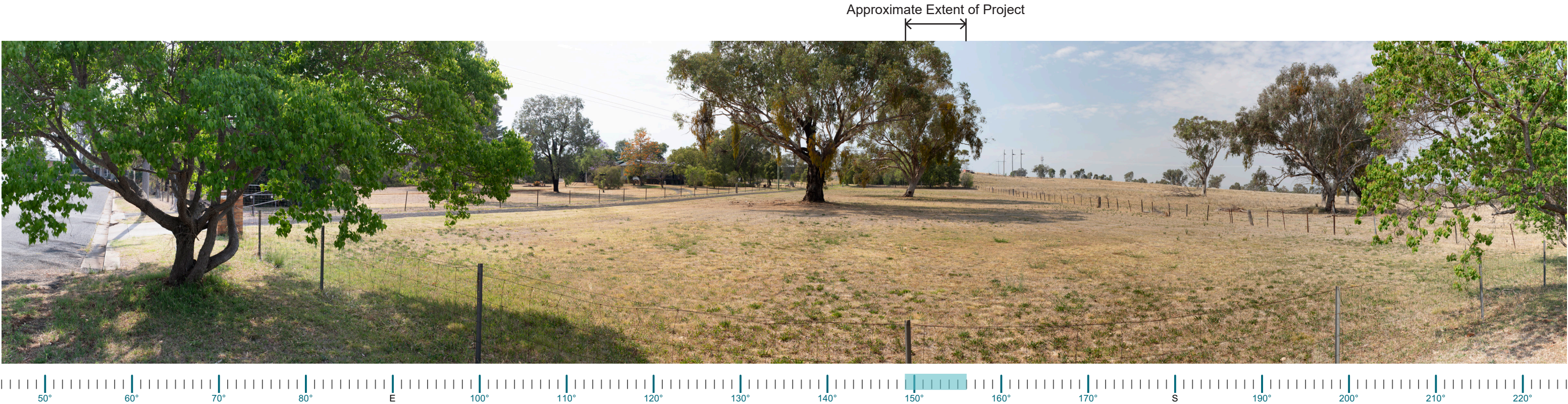
Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing transmission line infrastructure, the visual impact to the landscape character will be negligible.

Therefore, the visual magnitude of change is **VERY LOW**, resulting in a **VERY LOW** visual impact.

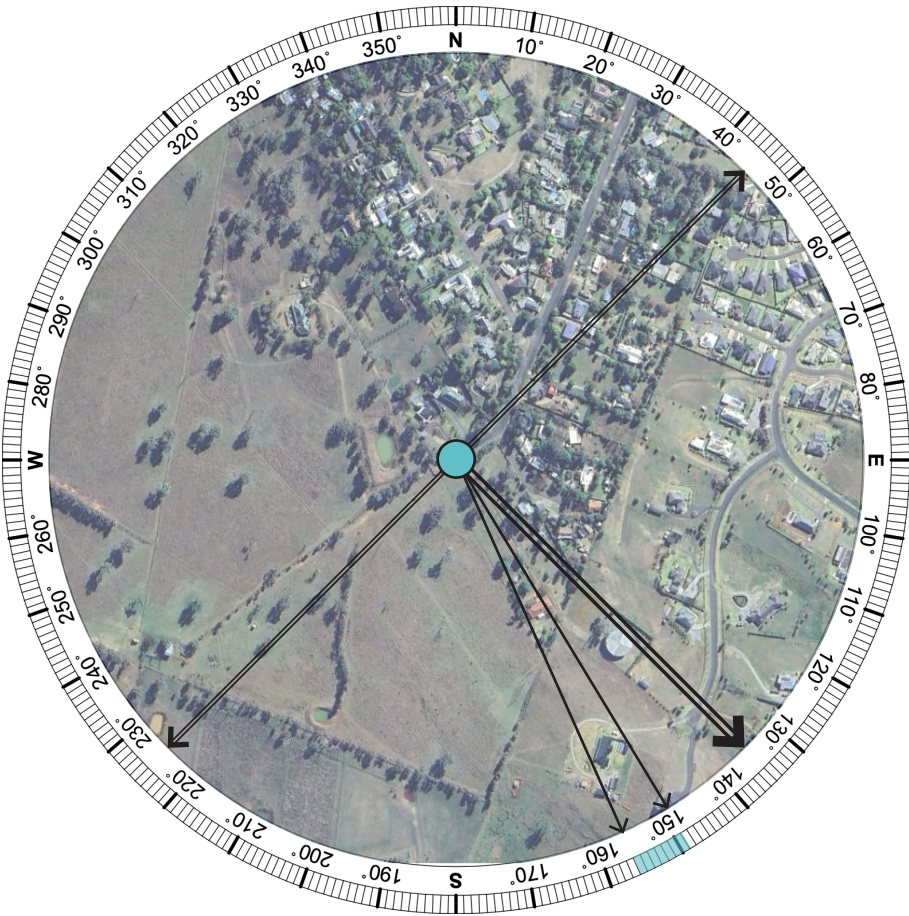
LEGEND

- ➡ Direction of Panorama
- ➡ Extent of Panorama
- ➡ Approximate Extent of Project

Viewpoint:
VP16 Darrell Road, Calala, NSW



Extent of Potential Visibility



Aerial Source: Google Earth, 2023

VIEWPOINT VP16

Viewpoint Summary:

Location:	Elevation:
Darrell Road, Calala, NSW	425 m
Coordinates:	Distance to Project:
31°08'21.60"S 150°56'55.72"E	1.70 km

Viewing Direction:
Southeast

Visual Sensitivity:
VERY LOW

Visual Magnitude:
VERY LOW

Visual Impact:
VERY LOW

Existing Landscape Character Description:

The viewpoint was taken from the end of Darrell Road, a local sealed road used by nearby Calala residences.

The surrounding landuse is divided, with land modified for residential developments to the east and land cleared for agriculture to the south. Powerline infrastructure is visible to the far southeast.

The topography is undulating, with the land sloping up from the viewpoint to help contain views.

Vegetation is scattered, with a strand of trees to the southeast screening views in that direction.

The visual sensitivity of this viewpoint has been rated as **VERY LOW**.

Potential Visual Impact:

An assessment based on topography alone suggests that the Project will not be visible from this location. (Based on 5m ZVI)

Additional ZVI analysis suggests that the 60 m high transmission line easement connecting the Project to Tamworth substation will be visible based on topography alone. However, due to existing transmission line infrastructure, the visual impact to the landscape character will be negligible.

Therefore, the visual magnitude of change is **VERY LOW**, resulting in a **VERY LOW** visual impact.

- LEGEND**
- ➡ Direction of Panorama
 - ➡ Extent of Panorama
 - ➡ Approximate Extent of Project

7.0 Photomontages

7.1 Overview of 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 VIA to assist in the visual impact assessment of the Project.

7.2 Wireframe Diagrams

A wireframe is a computed generated image based on a digital terrain model, that indicate the 3D shape of the landscape in combination with additional elements. They are a valuable tool in the VIA process as they allow the assessor to compare the position and scale of the Project to the existing view of a landscape (Scottish Natural Heritage, 2017). Wireframe diagrams can be seen as a worst case scenario as they do not take into account factors such as vegetation, building structures. Wireframe diagrams have been utilised in this VIA to verify photomontages.

7.3 Photomontage Development Process

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

- Capturing viewpoints with a Canon EOS 5D Mark IV digital SLR through a 50mm fixed focal 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 6.0**. 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.

7.4 Photomontage Selection

One (1) photomontage of the Project from VP06 within the existing context, were selected as a key view and represent general visibility of the Project (refer to Figure 12). Viewpoints selected for the preparation of photomontages are generally those determined to have the greatest potential visual magnitude change and impact in comparison to other viewpoints analysed in Section 5.0.

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



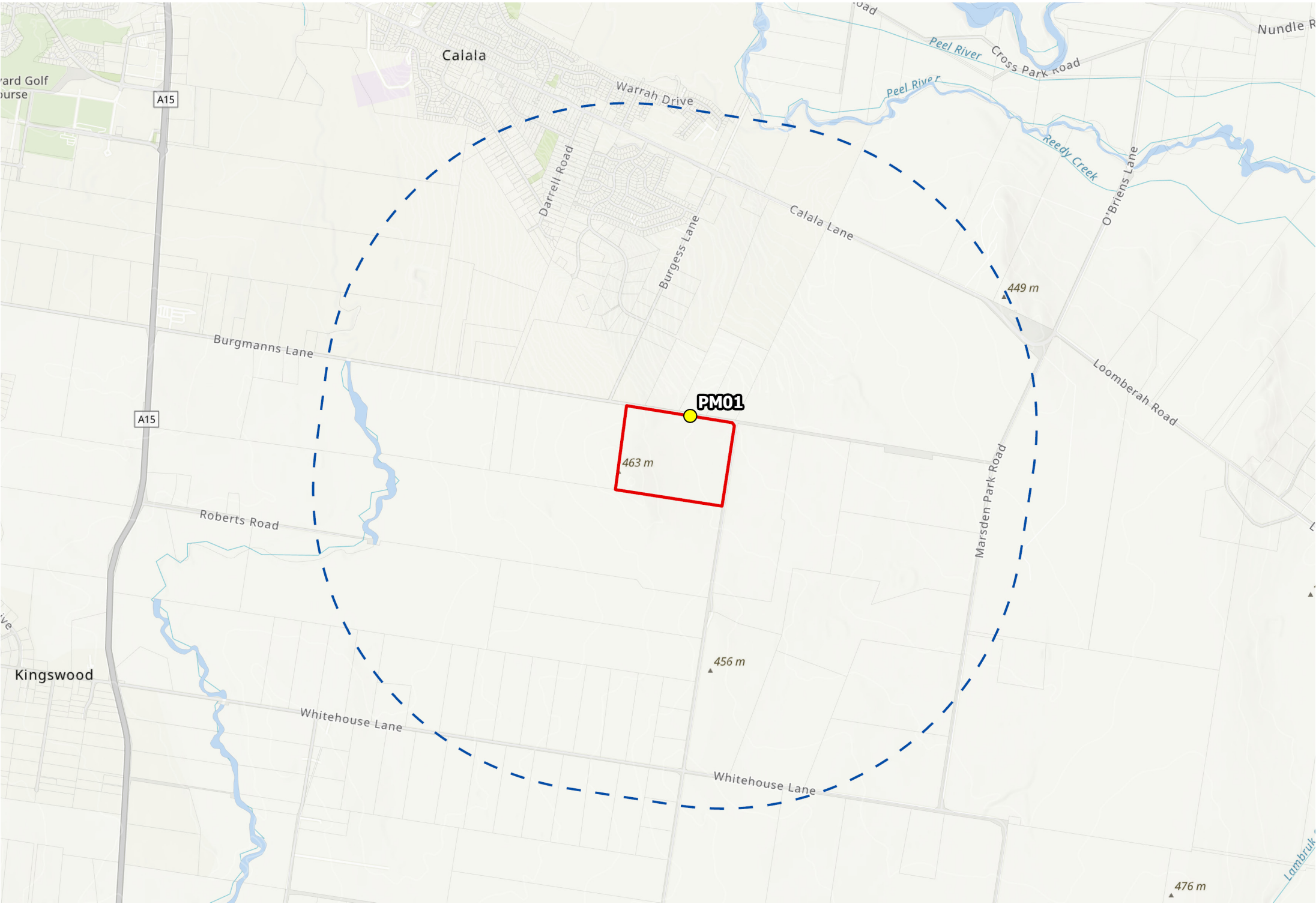
The digital panorama is imported into the modelling software and EXIF properties of the file are inserted automatically defining all relevant visualisation information as e.g. type of camera lens used, field of view for panoramas, the position and direction. Topography, control points, obstacle objects 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 11 – Photomontage Development Process



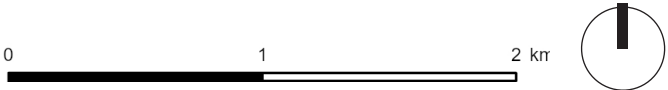
Photomontage Location

Refer to Section 7.4

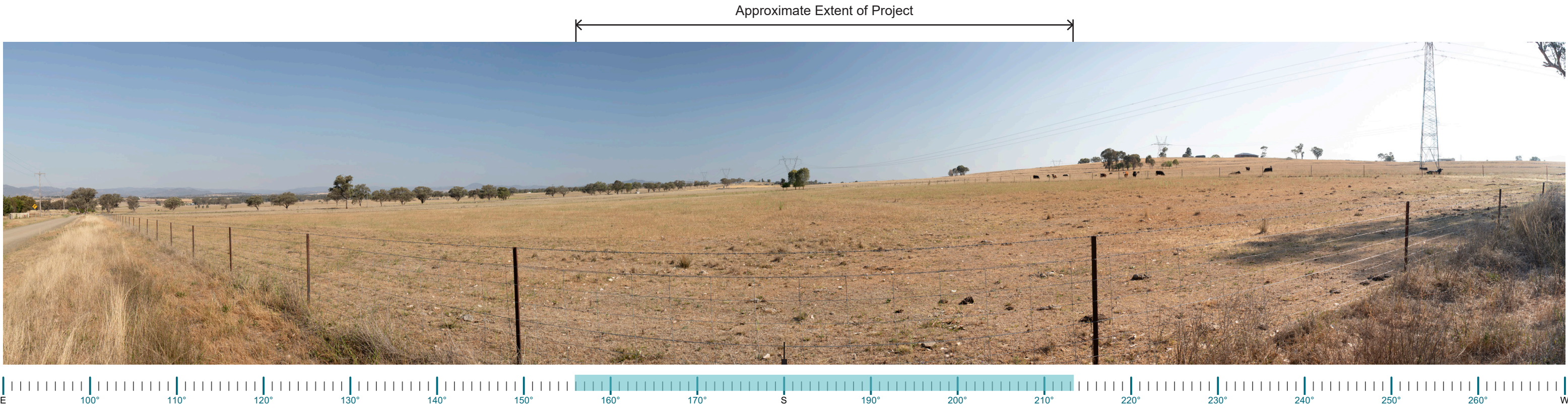
LEGEND

- 2km Study Area
- Project Boundary
- Roads
- Contour
- WaterFeature
- 2380_Photomontage Location

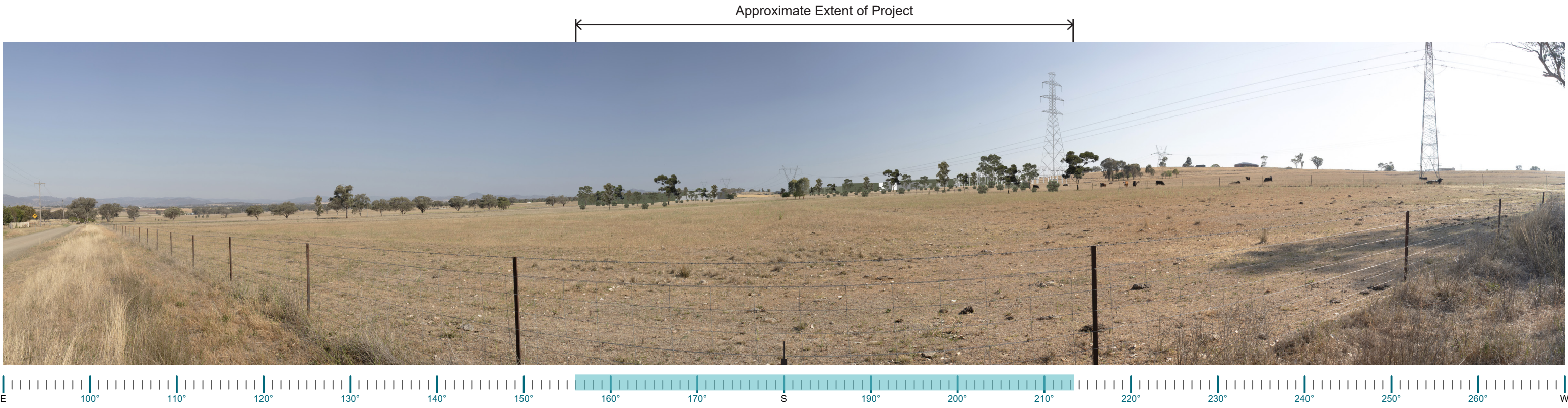
Figure 12 – Photomontage Location
Basemap Source: ARCGIS 2024, SEED 2019



Photomontage:
PM01 Burgmanns Road, Kingswood, NSW



180° Existing View



180° Proposed View

Photomontage has been developed using a model supplied by ARCADIS. Refer to ARCADIS DWGs and Shapefiles for all components, finishes and details.

*Please note that Photomontage has been prepared using a worst case scenario. The noise walls have been modelled to the edge of BESS Area Boundary. Noise walls will be built adjacent to BESS Modules anywhere within the BESS Area specified in Figure 2.

8.0 Visual Impact Assessment

8.1 Overview of Visual Impacts

In addition to the photographic viewpoint assessment, the following section provides an overview of the potential visibility from areas surrounding the Project. This is by no means an exhaustive description of the visibility from every locality, it is intended to provide an overall assessment of the potential visual impact on areas potentially effected by the Project.

8.2 Overview of Visual Impacts on Public Land

The undulating topography, scattered vegetation and built forms associated with the housing development to the northwest of the Project is likely to limit views of the Project (As shown in **Section 6.0**) beyond a few nearby roads, including:

Ascot-Calala Road: A local unsealed road used by nearby residences. The road runs adjacent to the Project Site with no existing vegetation on the Project side. As such, views are available to the Project along a 2 km stretch of road. However, the Project is located adjacent to existing 330kV Transmission line and likely to be viewed as part of the existing infrastructure. Additionally, the road is a low use road with a low visual sensitivity.

Calala Lane: A sealed road used by nearby residences to access Calala Suburb. Views of the Project will likely be partially filtered by the existing vegetation adjacent along the road and occupy a small portion of the view.

Marsden Park Road: A local unsealed road used by nearby residences. Views will likely be fragmented within a minimal visual impact due to the existing vegetation scattered adjacent along portions of the road and directly on the western boundary of the Project.

Burgess Lane: A sealed local road used by nearby residences. Views of the Project will be fragmented and viewed at speed along small portions of the road due to existing topography, scattered vegetation and intervening built elements.

Due to distance and scale of the Project, the Project will not be visible from the regional centre of Tamworth.

It is noted that existing infrastructure forms a key part the visual catchment in the form of Tamworth substation and associated 330kV transmission lines. Partial views of the Project are likely to be viewed as an extension/a part of existing infrastructure and will integrate into existing visual character of the surrounding area.

8.3 Methodology for Assessing Non-Associated Receivers

Moir LA have developed a framework for defining and rating the level of visual effect from each receiver.

The framework in Table 08 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 MoirLA's extensive professional experience in undertaking LVIA's. Published in 2013, the GLVIA3 is well established as providing 'best practice guidance' when undertaking Landscape and Visual Impact Assessment (LVIA). 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.*

(Source: RVAA, 2019)

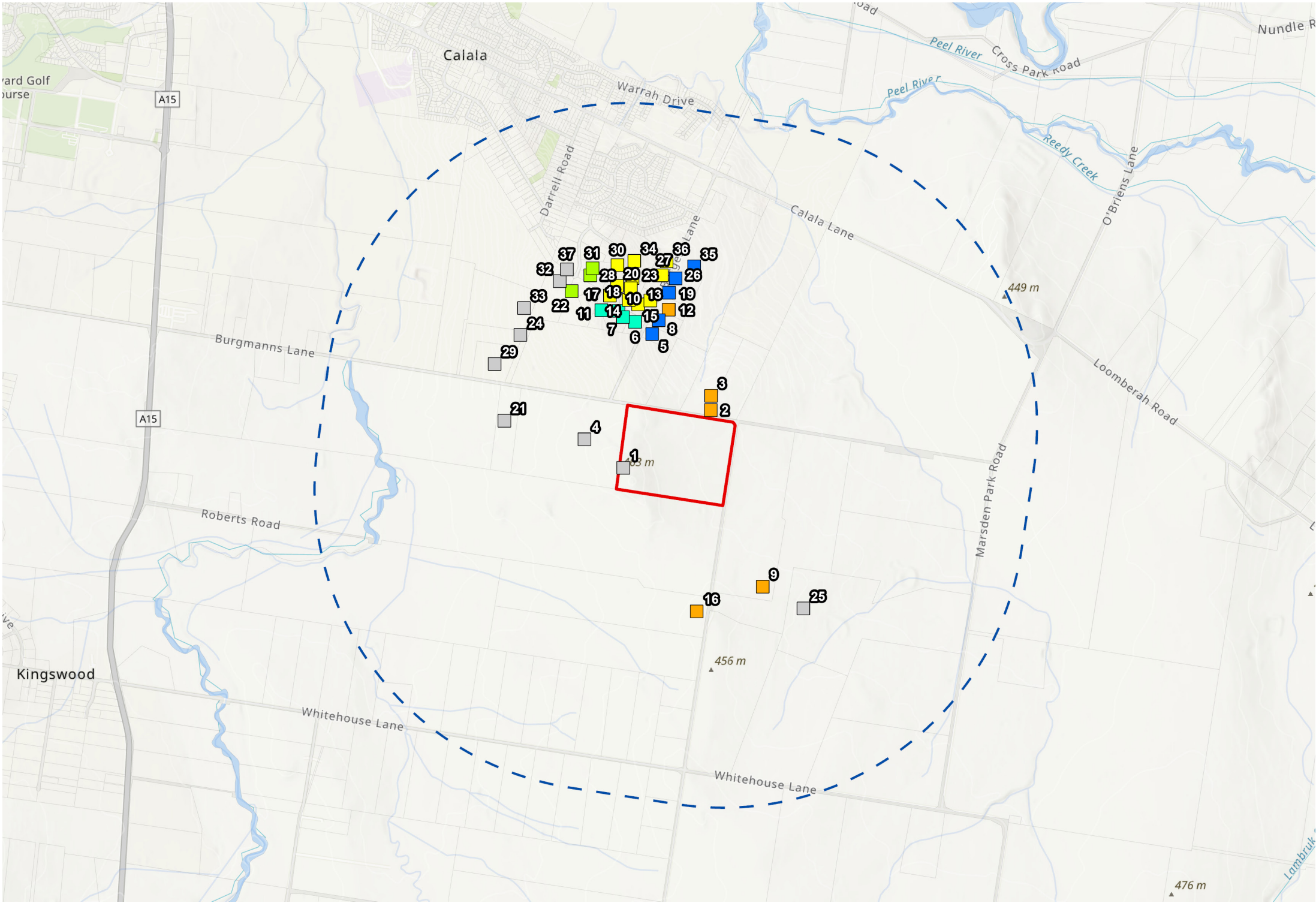
8.4 Clusters of Non-Associated Receivers for Assessment

Due to the density of receivers to the north of the Project, receivers have been assessed in clusters. The clusters have been defined by receivers which have similar locations, views and intervening visual elements (refer to **Figure 13**). A representative receiver has been selected and assessed from each cluster (refer to **Table 07**), and the resulting visual impact rating is indicative for all receivers within that group.

GROUP	ReceiverS	REPRESENTATIVE Receiver
1	5, 8, 19, 26, 35	5
2	6, 7, 10, 11	6
3	22, 28, 31	22
4	13, 36, 27, 15, 14, 17, 18, 20, 23, 30, 34	13
5	25, 4, 21, 29, 24, 33, 32, 37	4

Table 07 – Receiver Clusters for Assessment

All receivers not grouped have been assessed individually or removed from assessment as the ZVI calculated that they would have no views of the Project (refer to **Figure 13**).



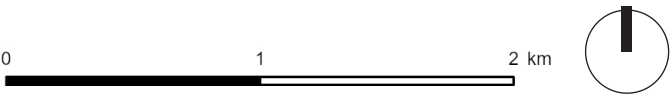
Receiver Layout

Refer to Section 7.4

LEGEND

- 2km Study Area
- Project Site
- Lot
- Hydroline
- Roads
- Dwellings
 - Individually Assessed
 - Group 1
 - Group 2
 - Group 3
 - Group 4
 - Receiver with no visibility (as determined by ZVI without transmission line)

Figure 13 – Receiver Layout
Basemap Source: ARCGIS 2024, SEED 2019



Receiver VISUAL IMPACT RATING				
	VERY LOW	LOW	MODERATE	HIGH
		←-----→		
Distance	The Project will 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 will 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 will not dominate primary views.	The Project will 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 will 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 will not change to the existing visual character.	The Project has the potential to become a noticeable element in the view, yet will not overly diminish the existing visual character.	The Project has the potential to alter the existing visual character.
Degree of contrast		The Project will have a low level of contrast with the existing landscape.	The Project will result in a moderate level of contrast with the existing landscape.	The scale of the Project will 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 08 – Non-Associated Receiver Visual Impact Rating

8.5 Overview of Visual Impacts on Nearby Receivers

For the purposes of this assessment, 36 non-associated receivers (data provided by ARCADIS) have been identified within 1 km of the Project (Refer to **Figure 09** and **Figure 13**). The ZVI determined that all receivers will have potential visability of the Project if an overhead transmission line connection is required. However, by comparing the two (2) ZVI's with and without the transmission line, it was concluded that eight (8) of the non-associated receivers have been identified as having potential visibility of the tranmission line easement only (if overhead) (i.e not the BESS facility).

The receivers have been assessed using desktop assessment tools including ZVI, topographic maps aerial imagery and representative viewpoints as shown in **Section 6.0**.

Of the 36 non-associated receivers, **nine (9)** have been identified as having a moderate visual impact rating due to their close proximity to the Project and lack of intervening screening vegetation to the northwest of Project due to transmission easement. However, the mitigation proposed will reduce the visual impacts of the Project to acceptable levels (Low visual impact rating) (Refer to **Section 11.0** and **Draft Landscape Mitigation Plan** provided by Moir LA).

The remaining non-associated receivers have been identified as having a low or very low visual impact rating due to intervening topography, vegetation and built structures.

Energy Infrastructure including Tamworth substation and associated transmission lines forms part of the surrounding visual catchment and are key elements within the primary views of these receivers. As such, The Project is unlikely to modify the visual catchment and instead be viewed as an extension of existing landscape features. However, mitigation should be considered to reduce the magnitude of visual modification as these receptors will view the full extent of the Project according to the ZVI.

Note that receivers to the northwest of the Project have been assessed in clusters due to their close proximity and similarity in location, views and intervening visual elements. Their rating is reflected by the representative receiver assessed in **Table 09**. (Refer to **Section 8.3** and **Figure 13** for receiver clusters.)

Receiver ASSESSMENT TABLE (non-associated reviewers within 1 - 1.5 kilometres of the Project)																	
I.D	ADDRESS	ELEVATION	DISTANCE TO PROJECT	VISUAL ASSESSMENT		Receiver Visual Impact Rating								VISUAL IMPACT RATING (without mitigation)	MITIGATION MEASURES (refer to Section 11)	VISUAL IMPACT RATING (with mitigation)	
						Distance	Views	Direction	Visibility	Scale	Contrast	Duration	Mitigation				
16	877 AS-COT-CALALA ROAD KING-SWOOD	441 m	0.72 km	Receiver is located approximately 0.72 km south of the Project Site. The receiver is oriented northwest-southeast, with views towards the north. Assessment of the aerial image indicated that no vegetation surrounds the receiver, providing open views to the north.	H									Moderate	Perimeter planting proposed along the southern boundary of the Project.	Low	
					M												
					L												
					VL												
9	910 AS-COT-CALALA ROAD CALALA	436 m	0.60 km	Receiver is located approximately 0.60 km southeast of the Project Site. The receiver is oriented northwest-southeast, with views towards the north. Assessment of the aerial image indicated that scattered vegetation surrounds the receiver and along Ascot-Calala Road, providing fragmented views to the northwest.	H								Moderate	Perimeter planting proposed along the southern/eastern boundary of the Project.	Low		
					M												
					L												
					VL												
2	795 BURG-MANNS LANE CALALA	427 m	0.05 km	Receiver is located approximately 0.05 km north of the Project Site. The receiver is oriented southeast-northwest, with views towards the southeast. Assessment of the aerial image indicated scattered vegetation to the south of the receiver, creating filtered views to the south.	H								Moderate	Scattered planting proposed along the northern boundary of the Project.	Low		
					M												
					L												
					VL												
3	781 BURG-MANNS LANE CALALA	427 m	0.15 km	Receiver is located approximately 0.15 km north of the Project Site. The Receiver is oriented north-south, with views towards the south. Assessment of aerial image indicated scattered vegetation southwest and southeast of the receiver, with built forms to the southeast, however, views directly south are open, with no obstructions.	H								Moderate. In the context of existing infrastructure.	Scattered planting proposed along the northern boundary of the Project.	Low		
					M												
					L												
					VL												
12	93 BURGESS LANE CALALA	425 m	0.67 km	Receiver is located approximately 0.67 km north of the Project Site. The receiver is orientated north-south with views towards the south. Assessment of the aerial image indicated that scattered vegetation surrounds the receiver, providing fragmented views towards the south.	H								Moderate	Scattered planting proposed along the northern boundary of the Project.	Low		
					M												
					L												
					VL												
5 (8, 19, 26, 35)	111 BURGESS LANE CALALA	430 m	0.49 km	Receiver is located approximately 0.49 km north of the Project Site. The receiver is orientated east-west with views to the east. Assessment of aerial image indicated that dense vegetation surrounds the receiver, obstructing views to the south.	H								Low	Scattered planting proposed along the northern boundary of the Project.	Low		
					M												
					L												
					VL												

Table 09 – Non-Associated Receiver Assessment

Receiver ASSESSMENT TABLE (non-associated reviewers within 1 - 1.5 kilometres of the Project)																			
I.D	ADDRESS	ELEVATION	DISTANCE TO PROJECT	VISUAL ASSESSMENT		Receiver Visual Impact Rating								VISUAL IMPACT RATING (without mitigation)	MITIGATION MEASURES (refer to Section 11)	VISUAL IMPACT RATING (with mitigation)			
						Distance	Views	Direction	Visibility	Scale	Contrast	Duration	Mitigation						
6 (7, 10, 11)	51 FALCON DRIVE CALALA	447 m	0.65 km	Receiver is located approximately 0.65km northwest of Project Site. The receiver is orientated northeast-southwest with some views towards the south. Assessment of aerial image indicated sparse vegetation to the southeast of the receiver, and scattered vegetation further southeast along Burgmanns Lane. Providing filtered views towards the southeast.	H									Moderate	Scattered planting proposed along the northern boundary of the Project.	Low			
					M	■	■		■	■		■	■						
					L			■	■		■								
					VL				■			■	■						
22 (28, 31)	7 WHIPBIRD STREET CALA-LA	448 m	0.89 km	Receiver is located approximately 0.89 km northwest from the Project Site. The receiver is orientated east-west with secondary views to the south. Assessment of aerial image indicated dense vegetation to the immediate south of the receiver and intervening built structures will result in fragmented views towards the southeast.	H									Low	Scattered planting proposed along the northern boundary of the Project.	Very Low			
					M	■							■						
					L	■	■	■	■		■						■		
					VL		■	■	■	■							■		
13 (36, 27, 15, 14, 17, 18, 20, 23, 30, 34)	68 FALCON DRIVE CALALA	434 m	0.67 km	Receiver is located approximately 0.67 km northwest from the Project Site. The receiver is orientated east-west with peripheral views to the south. Assessment of aerial image indicated that surrounding built structures and scattered vegetation to the far southeast will obscure views to the south.	H									Low	Scattered planting proposed along the northern boundary of the Project.	Very Low			
					M												■		
					L	■	■		■										
					VL			■	■	■		■					■		
4 (25, 21, 29, 24, 33, 32, 37)	696 BURGMANN'S LANE KINGSWOOD	436	0.25 km	Receiver is located approximately 0.25 km west from the Project Site. The receiver is orientated east-west with peripheral views to the south. ZVI analysis indicates that the Project will not be visible from this receiver, however the potential overhead transmission line easement to the northeast will be visible based on topography alone. However, due to the existing transmission lines adjacent, the impact to the existing landscape character will be minimal.	H									Very Low	No mitigation required	Very Low			
					M													■	
					L			■											
					VL	■	■	■	■	■		■					■		

Table 10 – Non-Associated Receiver Assessment

8.6 Overview of Landscape Character Assessment

The following table provides an overview of the impacts of the Project on each Landscape Character Zone. The table takes into account the visual sensitivity and magnitude on each LCZ

LCZ	VISUAL SENSITIVITY	VISUAL MAGNITUDE	LANDSCAPE CHARACTER IMPACT
LCZ01 Grazing & Cropping Pastures	Scenic Quality: Low Receptor Rating: Moderate (receivers in rural area:RU1 & RU4) Visual Sensitivity: MODERATE Views within this LCZ are from RU4 rural pastures small lots and rural properties. Comprised of cleared pastures utilised for grazing and cropping with scattered remnants of native trees.	LOW The majority of views from this LCZ are open, however, scattered vegetation and energy infrastructure are likely to fragment views of the Project. The Project will be visible from selected areas, however, it is likely that the Project will be viewed as an extension of the existing infrastructure associated with Tamworth substation. The Project is unlikely to compete or contrast with the landscape features in this area.	LOW
LCZ02 Town	Scenic Quality: Low Receptor Rating: High (receivers in residential areas: R5) Visual Sensitivity: MODERATE Views from large and small residential lots that form the south-eastern corner of Calala suburb, consisting of modified areas.	VERY LOW Views from this LCZ are mainly contained by vegetation associated with private properties and nearby built structures. These visual elements will likely screen views of the Project. It is unlikely that the Project will be viewed as a dominant visual feature and read as part of the existing infrastructure associated with Tamworth substation.	LOW
LCZ04 Creek Corridors	Scenic Quality: Low Receptor Rating: Moderate Visual Sensitivity: MODERATE Views of waterways and riparian vegetation corridors adjacent to rural land uses.	VERY LOW Views from this LCZ are generally contained by dense riparian vegetation adjacent to creeks. This vegetation will typically screen views of the Project. It is unlikely that the Project will be viewed as a dominant visual feature and instead read as part of the existing infrastructure associated with Tamworth substation.	LOW

Table 11 – Overview of Assessment of Visual Impacts on LCZs

9.0 Nightlighting

9.1 Overview of Potential Night Lighting Sources

As the Project is located in close proximity to Tamworth substation, where there are existing sources of nightlighting within the Study Area from infrastructure elements. Existing lighting associated with rural residential and large lot residential receivers and motor vehicles are dispersed around the Study Area, in proximity to the suburb of Calala to the northwest. The impact of nightlighting is unlikely to be experienced from inside of a nearby rural receiver as internal lights reflect on windows - limiting views to the exterior at night.

The requirements for nightlighting of ancillary infrastructure for this Project is generally limited to security lighting for the onsite substation, and O&M facilities, internal roads and car park area. The light sources are limited to lowlevel lighting for security, night time maintenance and emergency purposes, designed as per AS4282-1997. It is unlikely the proposed nightlighting associated with the ancillary infrastructure would create a noticeable impact on the existing night time landscape.

9.2 Design Principles

The following recommendations have been developed with consideration of the principles outlined in relevant best practice guidelines for lighting design. The Dark Sky Planning Guidelines (DPHI, 2016) provides guidelines for lighting practices that support the maintenance of a dark sky and improve lighting practice. The guideline is related to developments within 200 km of the Siding Spring Observatory, however, they provide relevant guidance to reduce potential light pollution can be applied to lighting design for the ancillary infrastructure for the proposed BESS. The Australian Standard for control of the obtrusive effects of outdoor lighting (AS4282-1997) may also be considered during the detailed design phase for nightlighting considerations. It is likely there will be limited or no visual impacts resulting from nightlighting of ancillary structures for the Project.

Control the Level of Lighting

- Only use lighting for areas that require lighting i.e. paths, building entry points
- Reduce the duration of lighting:
- Switch off lighting when not required
- Consider the use of sensors to activate lighting and timers to switch off lighting

Lighting Design

- Use the lowest intensity required for the job
- Use energy efficient bulbs and warm colours
- Direct light downwards to eliminate
- Ensure lights are not directed at reflective surfaces
- Use non-reflective dark coloured surfaces to reduce reflection of lighting (**Figure 14**)
- Keep lights close to the ground and / or directed downwards (**Figure 14**)
- Use light shield fittings to avoid light spill (**Figure 15**).

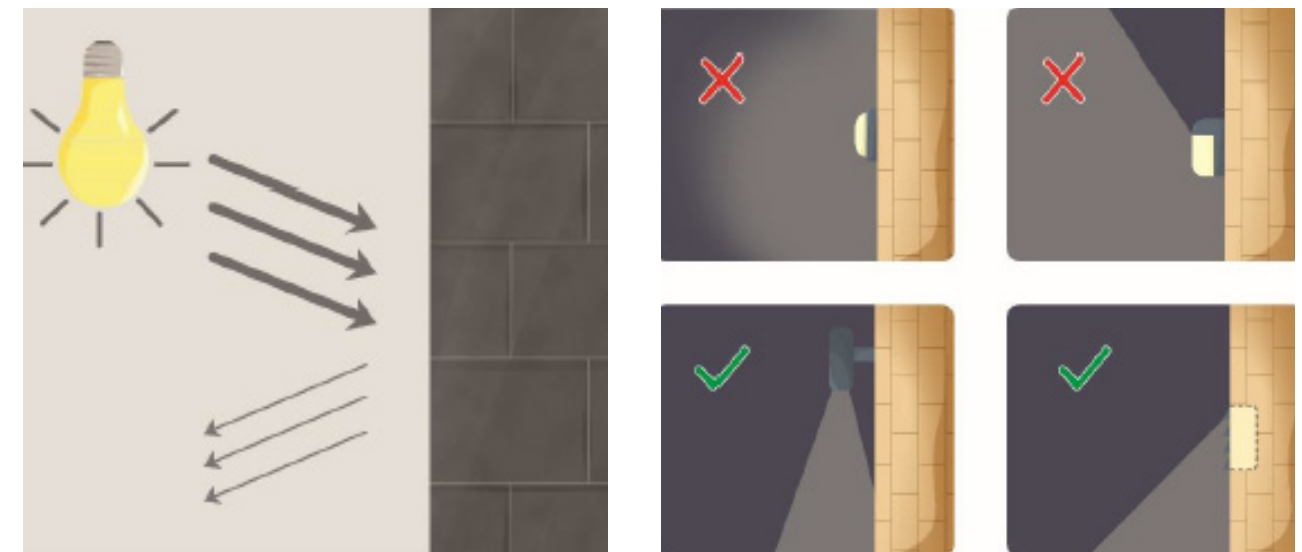


Figure 14 – Surface Reflectivity & Downward Lighting

Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife, 2020

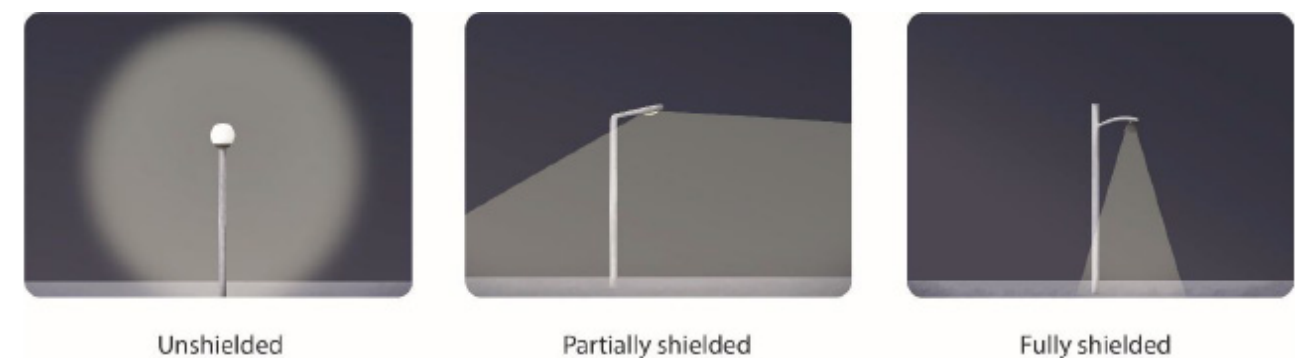


Figure 15 – Light Shielding

Source: Department of Environment and Energy National Light Pollution Guidelines for Wildlife, 2020

10.0 Cumulative Visual Impacts

10.1 Overview Cumulative Visual Impacts

Cumulative landscape and visual effects result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it) or actions that occurred in the past, present or are likely to occur in the foreseeable future (Landscape Institute, 2013). Cumulative effects may also affect the way a landscape is experienced and can be positive or negative. Where they comprise benefits, they may be considered to form part of the mitigation measures.

A cumulative impact assessment has several dimensions:

- The impact of the proposed development when added to the combined impacts of all other existing developments and environmental characteristics of the area.
- The impact of this development in the context of the potential for other infrastructure developments in the local, regional and national context.
- The impact of developments which are ancillary to or otherwise associated with the proposed Facility eg. The development of substations and associated infrastructure.

The potential cumulative visual impact must also be assessed in relation to the potential visual impact when viewed sequentially. If the Project is viewed in succession as a traveller moves through the landscape (eg. Motorist travel routes) this may result in a change in the overall perception of the landscape character. The viewer may only see one development at a time, but if each successive stretch of the road is dominated by views of a development, then that can be argued to be a cumulative visual impact (EPHC, 2010).

There are three (3) infrastructure projects located within close proximity to the Project. This includes:

- Calala BESS (SSD-52786213) located at 57 Burgess Lane, Calala consisting of a 300 MW/1200 MWh BESS facility and associated transmission lines.
- Tamworth BESS (SSD-23830229) located at 696 Burgmanns Lane, Tamworth consisting of a 200 MW / 400 MWh BESS facility and associated transmission infrastructure
- Existing Tamworth substation and associated infrastructure, including potential upgrades to enable BESS connections (Under Part 5 of the EP&A Act).

10.2 Assessment of Ancillary Infrastructure

In addition to the BESS, the associated infrastructure (as described in **Section 3.0**) has the potential to contrast with the existing visual landscape.

The Project will likely be visible from the immediate north, east and south of the Project site. This includes the, internal site access road and parking, permanent office and staff amenities, stormwater management infrastructure, lighting, fencing and security devices and noise acoustic barriers. However, proposed screening vegetation (Refer to **Section 11.0** and **Draft Landscape Mitigation Plan** provided by Moir LA) will reduce the visual impacts to acceptable levels.

Ancillary infrastructure visible outside these screening elements will likely be viewed as part of the Tamworth Substation and associated transmission infrastructure. This includes the proposed transmission line easement connecting the Project to the Tamworth Substation (above ground and/or below ground).

As outlined in Section 11.0, consideration should be given to the colour and materials of the ancillary buildings associated with the Project to ensure minimal contrast and assist in blending with the surrounding landscape.

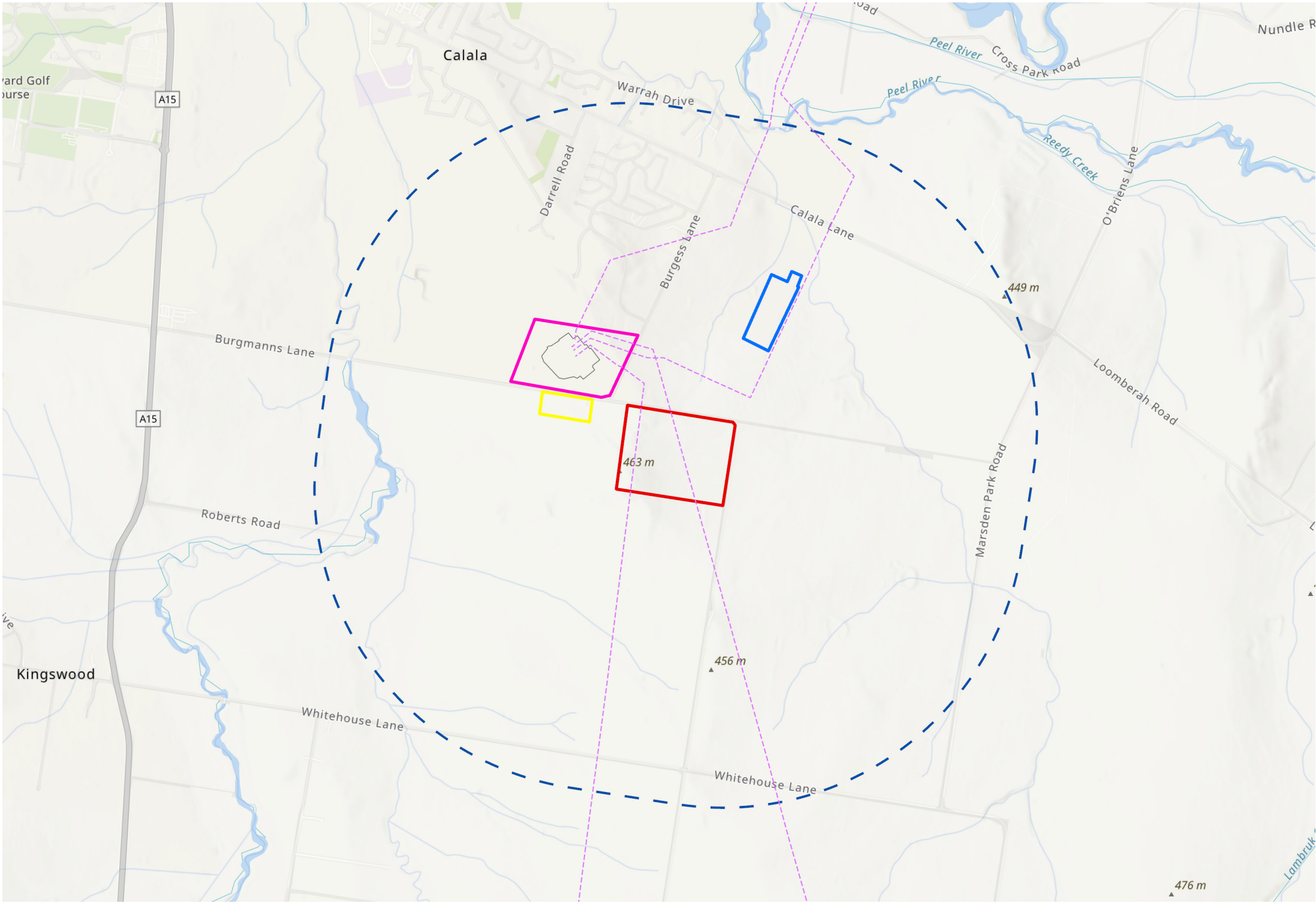
10.3 Assessment of Cumulative Visual Impacts

Energy infrastructure identified within the study area includes Tamworth substation and associated 330 kV transmission lines, the proposed Calala BESS approximately 0.54 km north from the Project Site and the proposed Tamworth BESS located approximately 0.26km west from The Project (Refer to **Figure 16**).

The Project has the potential to be viewed from the immediate north, east and south of the Project Site based on topography alone (Refer to **Section 5.0**) Therefore, the Project has the possibility of being viewed consecutively and/or in conjunction with existing infrastructure. Particularly along Calala Lane, Marsden Park Road and Ascot-Calala Road due to their close proximity. However these views are likely to be fragmented by existing vegetation adjacent to road corridors and scattered throughout the pastured lands surrounding the projects. Additionally, refer to **Section 11.0** for mitigation strategies to reduce the visual impact of the Project.

To assist in the cumulative visual impact assessment, a ZVI has been prepared to illustrate areas from which there is the potential to view the Project and Calala BESS simultaneously (based on topography alone) (Refer to **Figure 17**).

The Cumulative ZVI (refer to **Figure 17**) identified that 25 non-associated receivers have the potential to view both the Project and Calala BESS based on topography alone. However, analysis of aerial imagery (**refer to Section 8.5**) identified that both Projects will likely be screened from most receivers due to intervening vegetation and built elements. Receivers 2, 3, 9, upon analysis of aerial imagery, seem to have limited screening elements and therefore will likely have views of both projects. However, mitigation proposed (refer to **Section 11.0**) will reduce these impacts. Receiver 22 will have the potential to view The Project, Calala BESS and Tamworth BESS. However, analysis of aerial imagery identified that all projects will likely be screened by existing built elements and vegetation. No other receivers have the potential to view Tamworth BESS and The Project together.



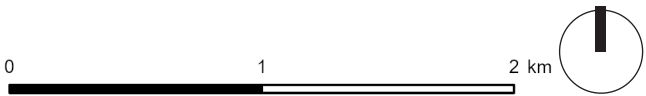
Nearby Infrastructure

Refer to Section 10.3

LEGEND

- Project Site
- 2km Study Area
- Proposed Calala BESS (SSD-52786213)
- Proposed Tamworth BESS (SSD-23830229)
- Existing Tamworth Substation Project Boundary
- 330_kV Transmission Line
- Roads

Figure 16 – Nearby Infrastructure
Basemap Source: ARCGIS 2024, SEED 2019, NSW Spatial Data, 2024



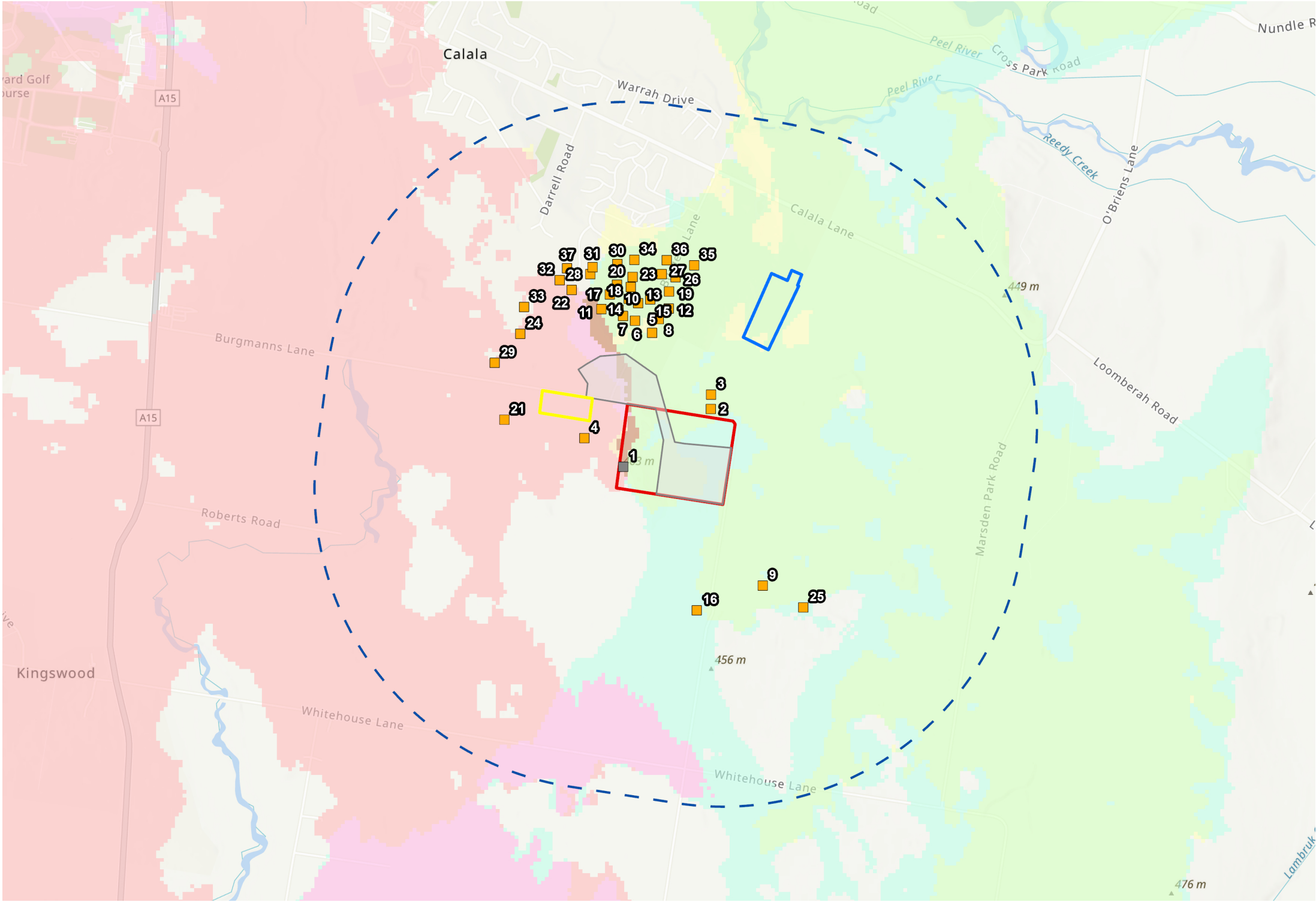
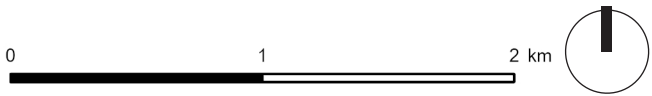


Figure 17 – Cumulative Zone of Visual Influence
Basemap Source: ARCGIS 2024, WINDPRO 2024

Cumulative Zone of Visual Influence

Refer to Section 10.3



11.0 Mitigation Recommendations

11.1 Recommended Mitigation Methods

As discussed in **Section 8.0**, there are opportunities to view the Project in close proximity along Ascot-Calala Road and nearby receivers (Receiver 16, 9, 2, 3). The following section outlines recommendations to further reduce any potential visibility of the Project.

11.2 Design Considerations & Onsite Mitigation

Good design principles employed through the Project design phase can significantly reduce the visual impact. These include the 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 applied to the site:

- Consideration should be given so that the colour of the noise wall and ancillary buildings to ensure minimum contrast and blend into the surrounding landscape to the extent practicable.
- Implement screen planting along northern, eastern and southern boundary of the Project Site to assist in mitigating the visual impacts of Ascot-Calala Road and Receiver's 2, 3, 6, 7, 9, 10, 11 and 16. Refer to Draft Landscape Mitigation Plan provided by Moir LA.

11.3 Landscaping Principles

To ensure that the screen planting integrates into the existing landscape character, the bands should be planted with fast growing small trees and bushes, and low lying vegetation to ensure a naturalistic effect. Plant species are to be selected in keeping with existing plant communities generally present at the site.

The existing character of the landscape allows for a variety of methods of landscaping and visual screening which will remain in keeping with the landscape character. General guidelines to adhere to when planning for landscaping and visual screening include:

- Planting should remain in keeping with existing landscape character;
- Species selection is to be typical of the area;
- Planting layout should avoid screening views of the broader landscape;
- Avoid the clearing of existing vegetation. Where appropriate reinstate any lost vegetation; and
- Allow natural vegetation to regrow over any areas of disturbance.

Locally native plant species are preferred, as they help to preserve the landscape character and scenic

quality of the area as well as building habitat for local fauna. Native species are also well-suited to local conditions (ie. soil, climate, etc.) and will build on the existing vegetation assemblages in the area.

Onsite mitigation proposed in the form of screen planting will utilise fast growing native vegetation. When practicable, the vegetation proposed will follow the visual character of the local native vegetation, utilising a scattered woodland layout (Refer to Landscape Mitigation Plan for details).

Table 12 provides a summary of the mitigation measures proposed.

Design	Mitigation Measures
V1	The design of the Project will consider the use of materials that integrate with the surrounding landscape. Where possible, suitable colours and finishes will be chosen for project infrastructure to minimise visual impacts (including glare/reflectivity), including ancillary infrastructure such as the O&M buildings/facilities and the noise acoustic wall surrounding the BESS. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (e.g. khaki, beige, green or similar) rather than white, so as to better blend in with the local rural landscape.
V2	Principals outlined in the Dark Sky Planning Guideline (DPHI, 2016) and National Light Pollution Guidelines for Wildlife (DEE, 2020) will be considered during the detailed design phase. Cut off and direct light fittings (or similar technologies) would be used where appropriate to minimise glare and light spill onto private property.
V3	Landscaping will be installed and maintained in accordance with the conceptual landscape plan, including screen planting along the north, east and south of the BESS facility. The final location and extent of landscaping will be determined during detailed design. The key principals include: • Planting should remain in keeping with existing landscape character • Species selection is to be typical of the area • Planting layout should avoid screening views of the broader landscape • Avoid the clearing of existing native vegetation. Where appropriate reinstate any lost vegetation • Allow native vegetation to regrow over any areas of disturbance.

Table 12 – Overview of Proposed Mitigation Measures

12.0 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 will impact on existing visual amenity, landscape character and scenic quality. If there is a potential for a negative impact on these factors it must then be investigated if and how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

As discussed in **Section 8.0**, infrastructure adjacent to the Project including Tamworth substation and associated 330kV transmission lines forms a key landscape feature. Therefore, The Project will not greatly alter the existing visual character and instead be viewed as an extension of the existing infrastructure.

Regarding the cumulative impacts, the Project has the opportunity to be viewed consecutively and/or in conjunction with existing and proposed infrastructure including Tamworth substation, surrounding 330kV Transmission Lines and proposed Calala BESS. (Refer to **Section 10.0**). However these views are likely to be fragmented by existing vegetation adjacent to road corridors and scattered throughout the pastured lands surrounding the projects. Additionally, proposed mitigation will further reduce visual impacts of the Project (refer to **Section 11.0**)

The opportunity to view the Project from publicly accessible land and roads is limited to Ascot-Calala Road, Calala Lane, Marsden Park Road and Burgess Lane due to undulating topography, scattered vegetation and built forms associated with the housing development to the northwest of the Project (as discussed in **Section 8.2**). Overall, out of the sixteen (16) public viewpoints assessed, three (3) viewpoints were assessed as having no visual impact, eleven (11) viewpoints were assessed as having a very low visual impact and two (2) viewpoints (VP05, VP06) were assessed as having a low visual impact rating. (Refer to **Section 6.0**)

For the purposes of this assessment, 36 non-associated receivers (data provided by ARCADIS) have been identified within 1 - 1.5 km of the Project (Refer to **Figure 09** and **Figure 13**). The ZVI determined that all non-associated receivers would have potential visibility of the Project due to topography alone.

Additional ZVI analysis identified that eight (8) of the non-associated receivers have potential visibility of the 60 m transmission line easement only (if overhead) (i.e not the BESS facility). However, due to existing transmission line infrastructure the visual impact to these receivers will be negligible.

. Of the remaining 28 receivers:

- Nine (9) receivers were assessed as having a Moderate Visual Impact.
- Nineteen (19) Receivers were assessed as having a Low Visual Impact.

To further reduce any potential visual impacts, mitigation in the form of screen planting has been proposed along the northern, eastern and southern boundary of the Project Site (Refer to **Section 11.0** and **Draft Landscape Mitigation Plan** provided by Moir LA). This will reduce the visual impacts of the Project to acceptable levels (i.e. low).

KINGSWOOD BESS

LANDSCAPE CONCEPT PLAN

744 BURGMANN'S LANE KINGSWOOD, NSW 2747.



Sheet no.	Drawing Title	Revision	Date
LCP001	COVER SHEET	B	14/05/24
LCP002	KEY PLAN	B	14/05/24
LCP003	PLANTING PLAN	B	14/05/24

LOCALITY PLAN
Scale: 1:10000
Source: Nearmap, 2024

0 200 400 600m



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ARCHITECT:

ENGINEER:

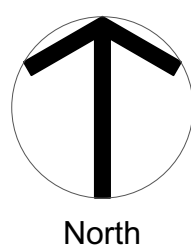
CLIENT:
ARCADIS Ltd

NOTE: DRAWING PURPOSES FOR APPROVAL ONLY. NOT FOR CONSTRUCTION.

No: DATE: REVISION:
A 05/04/24
B 14/05/24

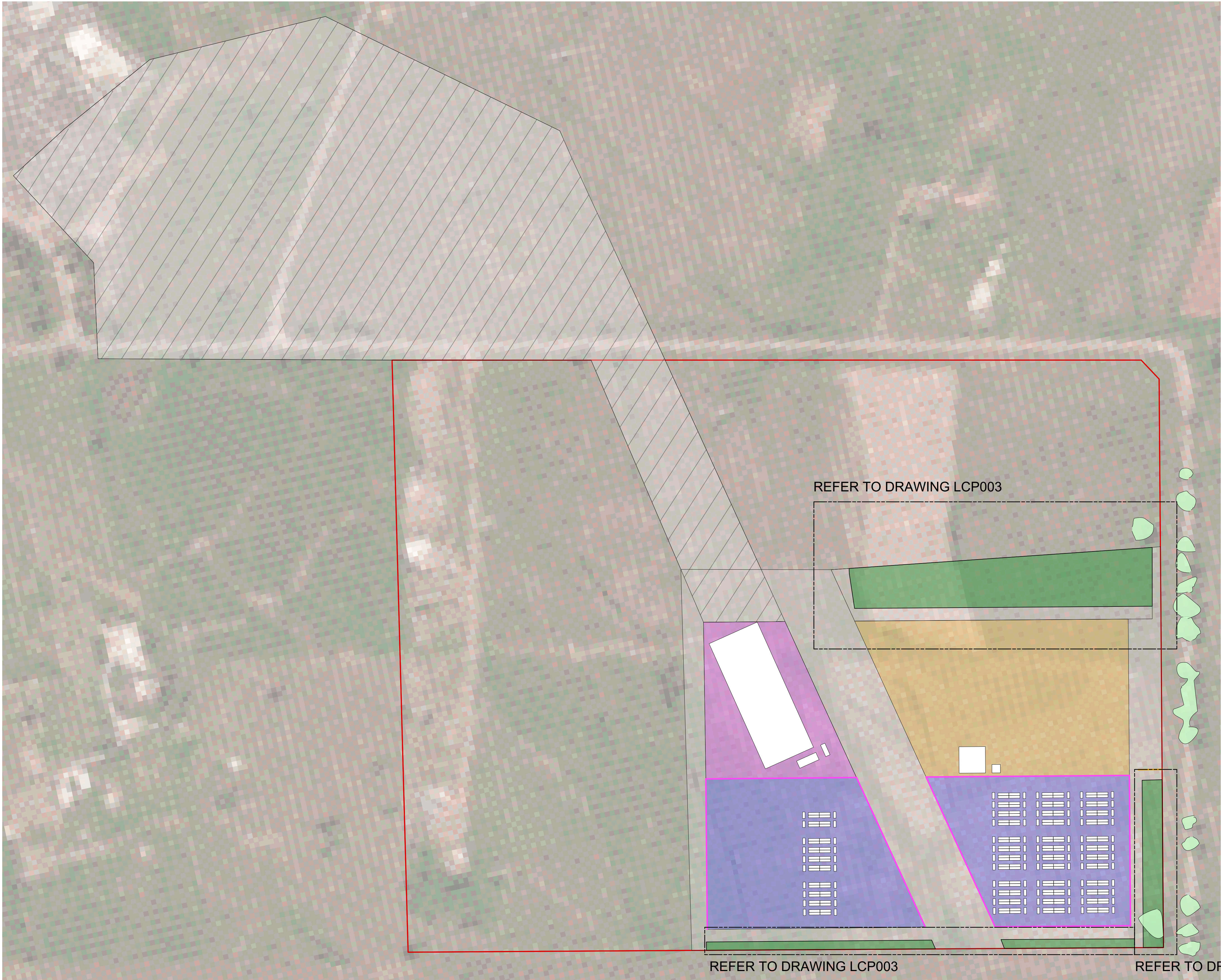
BY: PROJECT:
CD Kingswood BESS
Kingswood NSW

Status: DRAFT



COVER SHEET

SCALE: 1:10000
ORIGINAL DRAWING AT A1.
Drawn By: SW
Checked By: Approved By: DM
Project No. 2380
Drawing No. LCP001
Rev B



- LEGEND**
- Development site
 - Project site
 - Noise wall (indicative, subject to detailed design)
 - BESS area
 - BESS substation
 - Ancillary infrastructure
 - Access road
 - Transmission corridor of interest
 - Approximate extent of existing vegetation
 - Approximate extent of proposed screening: Refer to planting plan and planting schedule

REFER TO DRAWING LCP003

REFER TO DRAWING LCP003



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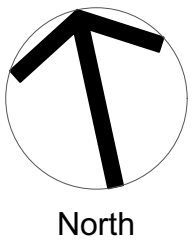
NOTE: DRAWING PURPOSES FOR APPROVAL ONLY. NOT FOR CONSTRUCTION.

No: DATE: REVISION:
A 05/04/24
B 14/05/24

BY: PROJECT:
CD Kingswood BESS
Kingswood NSW

Status: DRAFT

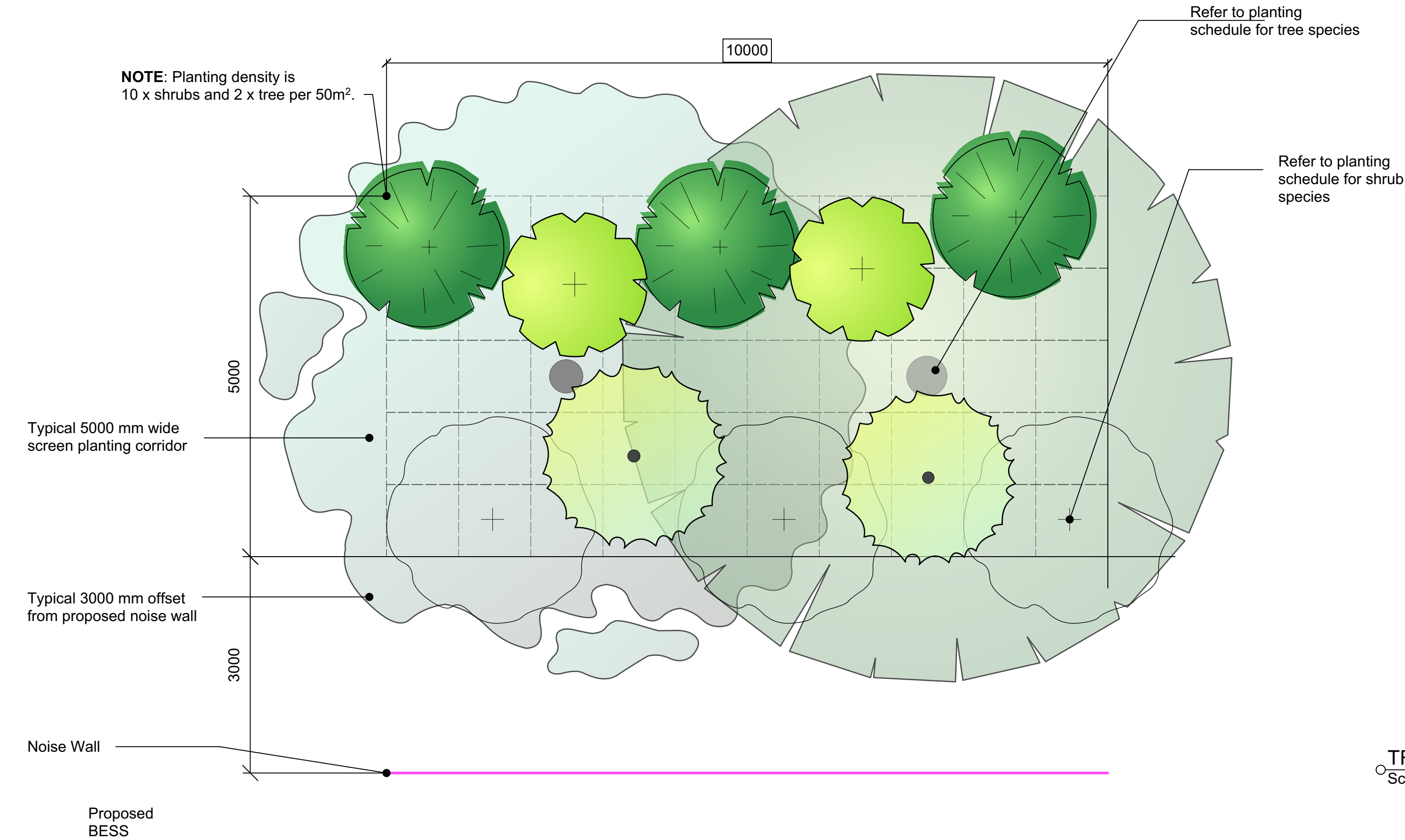
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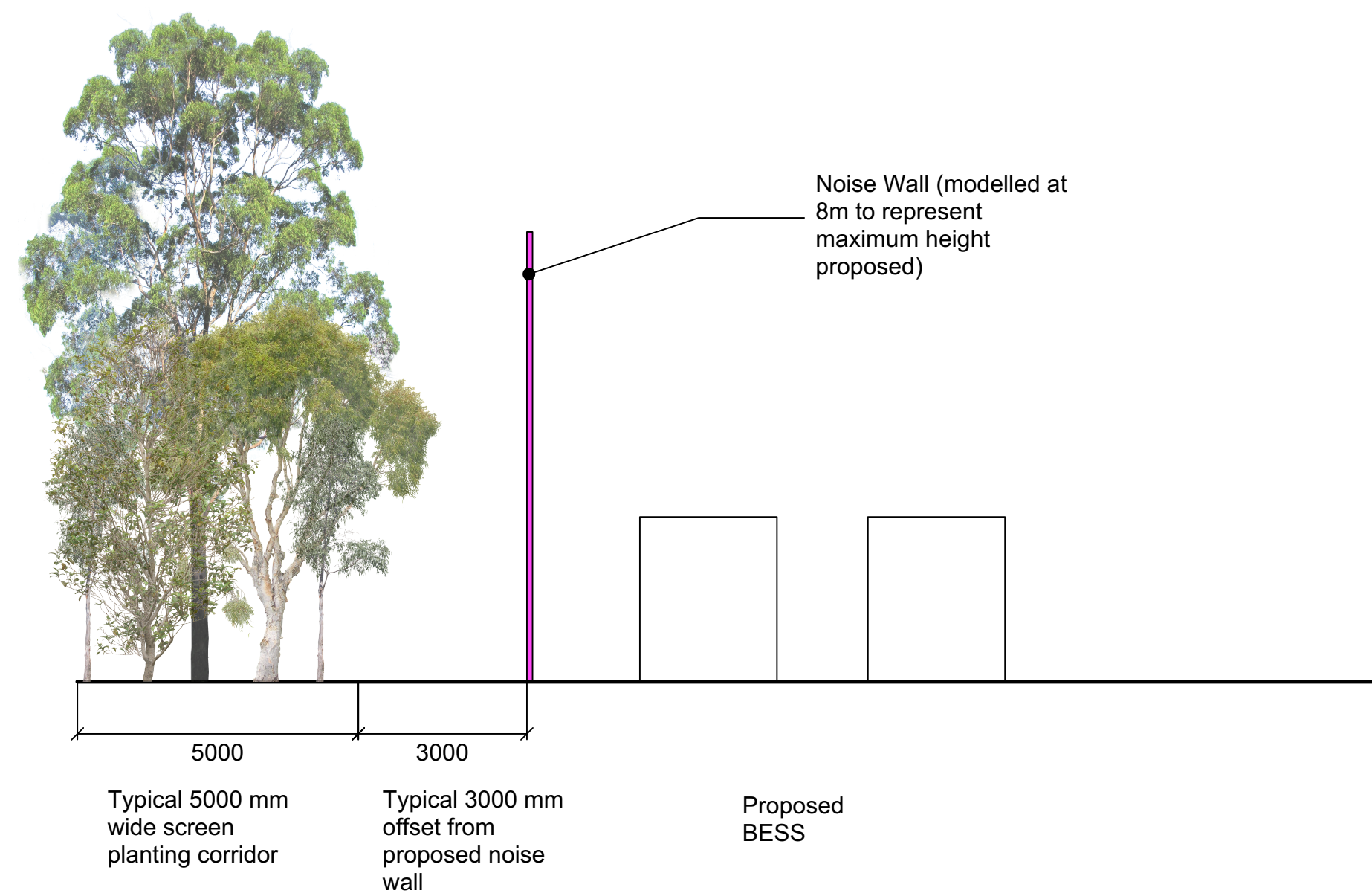
KEY PLAN

SCALE: 1:2000
ORIGINAL DRAWING AT A1.
Drawn By: SW
Checked By:

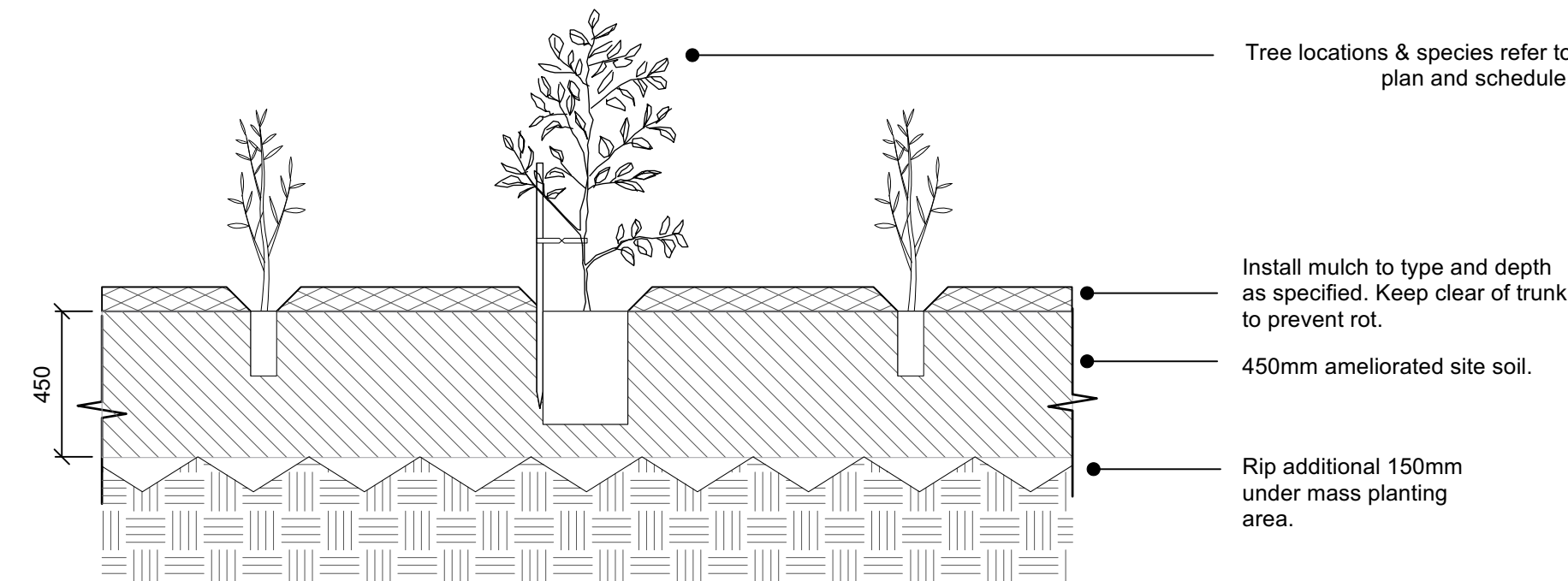
Project No. 2380
Drawing No. LCP002
Rev B



TYPICAL SCREENING PLANTING DETAIL
Scale 1:50 @ A3



TYPICAL SECTION PLANTING DETAIL
Scale 1:100 @ A3



TREE AND SHRUB PLANTING DETAIL
Scale 1:20 @ A3

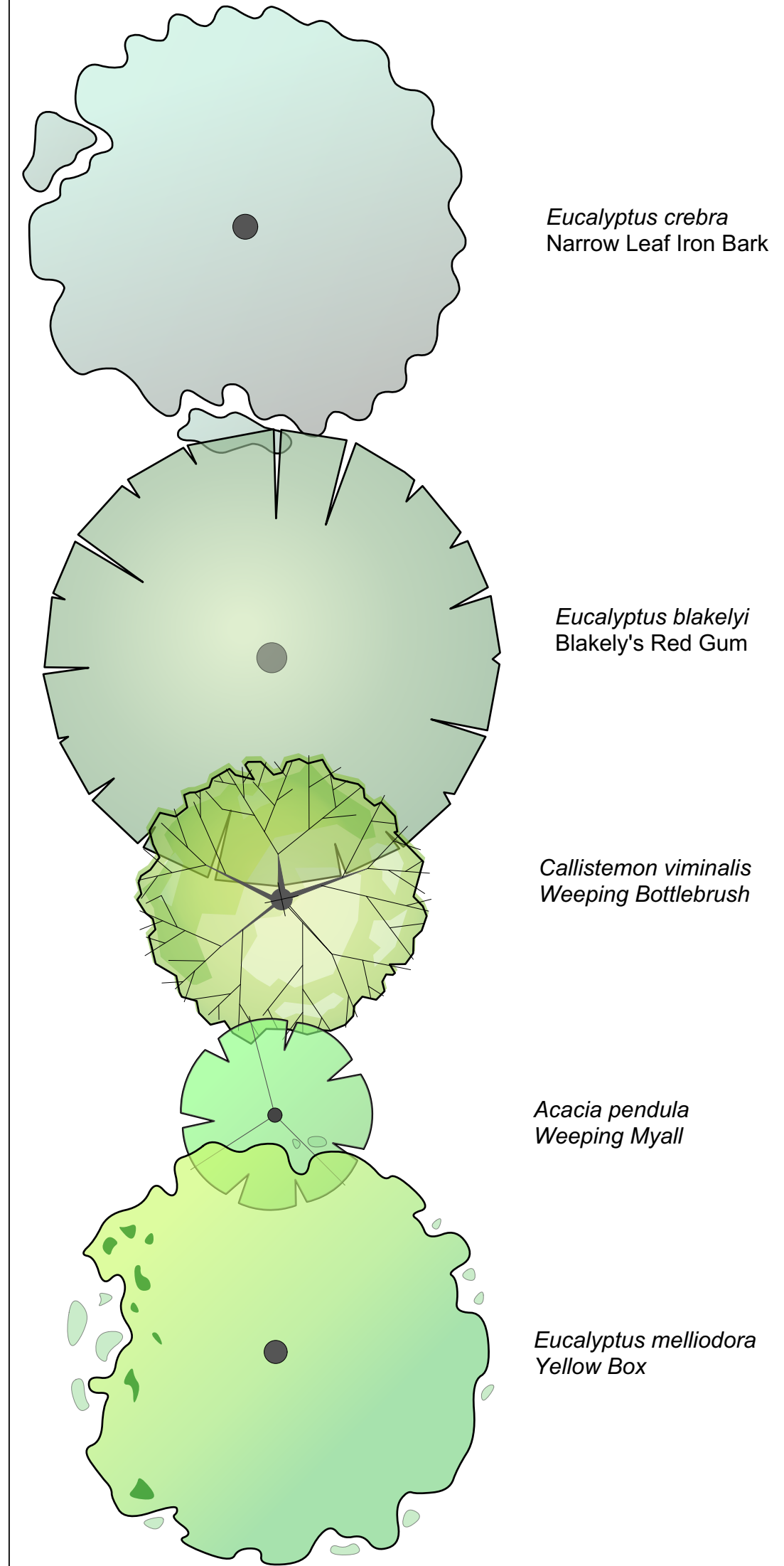
PLANT SCHEDULE - trees and shrubs

Planting Schedule

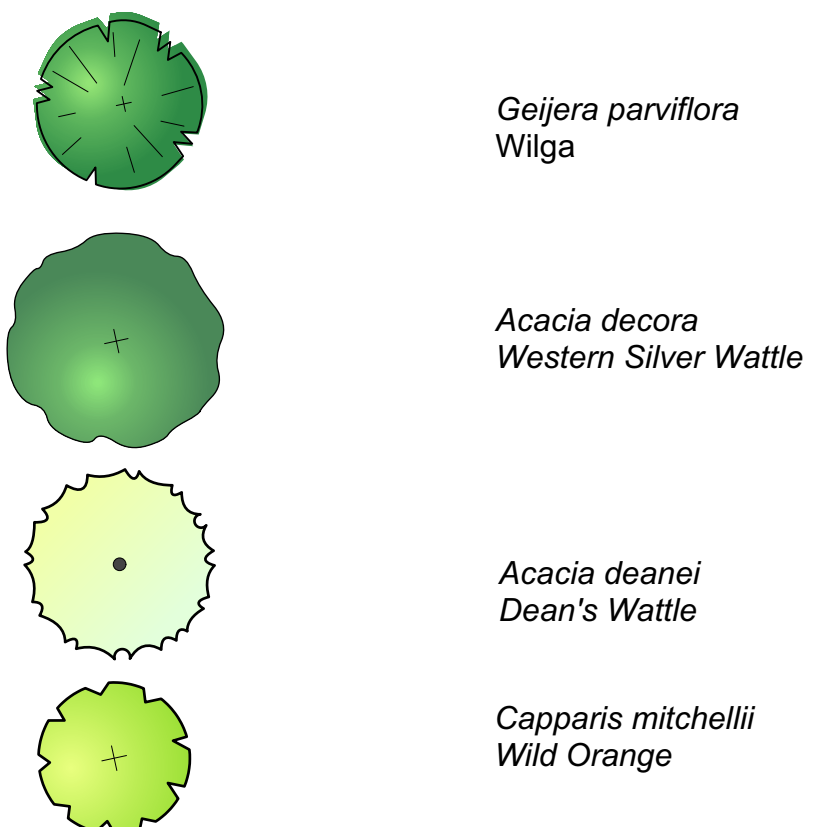
Code	Botanical Name	Common Name	Pot Size	Mature Height	Mature Spread	Qty
Trees						
ACA pen	<i>Acacia pendula</i>	Weeping Myall	25 litre	4 - 6m	3 - 4m	1
CAL vim	<i>Callistemon viminalis</i> 'Red Cascade'	Red Cascade Bottlebrush	25 litre	10 - 15m	3.5 - 6m	1
EuBl	<i>Eucalyptus blakelyi</i>	Blakelys Red Gum	25 litre	15 - 20m	6 - 10m	1
EUC mel	<i>Eucalyptus melliodora</i>	Yellow Box	25 litre	10 - 15m	8 - 10m	1
EuCr	<i>Eucalyptus crebra</i>	Narrow leaved Ironbark	25 litre	over 30m	6 - 10m	1
Shrubs						
ACA dea	<i>Acacia deanei</i>	Dean's Wattle	200 mm	3 - 5m	2 - 3m	3
ACA dec	<i>Acacia decora</i>	Western Silver Wattle	200mm	1 - 4m	2.0 - 3.5m	4
CAP mit	<i>Capparis mitchellii</i>	Wild Orange	200mm	1.5 - 2m	1.2 - 2.0m	3
GEI par	<i>Geijera parviflora</i>	wilga	200mm	3 - 5 m	2 - 3 m	4
WES fru	<i>Westringia fruticosa</i>	Coastal Rosemary	200mm	0.9 - 1.5m	0.9 - 1.2m	1

- LEGEND
- Project site
- Noise Wall (indicative, subject to detailed design)
- 3000
- Dimension (millimeters)

TREES



SHRUBS



PLANTING PLAN