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Yanco Delta Wind Farm

Environmental Impact Statement

Landscape and Visual Impact Assessment

Prepared for ViRYA | 31 October 2022

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GBD is a leading specialist in renewable energy landscape and visual impact assessment, setting a course that others follow.

Servicing the renewable energy industry for over 15 years, GBD has gathered a wealth of unrivalled project experience in a variety of landscapes.

GBD has applied knowledge across multiple state planning authorities addressing specific regulatory requirements for renewable energy developments.

Green Bean Design Pty Ltd (GBD)
ABN 86 603 575 702

LIMITATIONS

This report has been prepared in accordance with the usual care and thoroughness of the consulting profession for the use of Jacobs Australia Pty Ltd. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the GBD Proposal dated October 2022.

The methodology adopted and sources of information used are outlined in this report. GBD has made no independent verification of this information beyond the agreed scope of works and GBD assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to GBD was false.

This report was completed between May 2022 and October 2022 and is based on the conditions encountered and information reviewed at the time of preparation. GBD disclaims responsibility for any changes that may have occurred after this time.

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DOCUMENT CONTROL

Project Name	Yanco Delta Wind Farm
Report Title	Landscape and Visual Impact Assessment
Project Number	22-305
Version Number:	V4
Status	Final
Release approval	Jacobs Australia Pty Ltd Virya Energy Pty Ltd
Author	Andrew Homewood Registered Landscape Architect AILA, EIANZ *Graduate Diploma Landscape Management, BSc. (Dual Honours) Landscape Design and Archaeology, National Diploma Horticulture*
Date	31 October 2022

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Section 1. Introduction

1.1 Background

Green Bean Design Pty Ltd (GBD) has been commissioned by Virya Energy Pty Ltd (the Proponent) to undertake a Landscape and Visual Impact Assessment for the Yanco Delta Wind Farm (the Project) Environmental Impact Statement (EIS).

This Landscape and Visual Impact Assessment (LVIA) has been prepared to meet the objectives of the Wind Energy – Visual Assessment Bulletin, December 2016 (the Bulletin) as required by the New South Wales Government, Department of Planning and Environment (DPE). This LVIA supports the EIS and has been prepared to specifically address the Bulletin requirements applicable to a new wind farm development application for a State Significant Development (SSD) through the Planning Secretary's Environmental Assessment Requirements (SEARs).

Information and stated requirements from the Bulletin included in this LVIA are presented in *italics*.

1.2 Professional assessment skills

The Bulletin states that 'Professional assessment skills are critical to the effective application of visual assessment', and that *'The proponent is expected to engage professionals from relevant natural resource management and design professions (for example environmental planners, geographers, landscape architects, architects, or other visual resource specialists), with demonstrated experience and capabilities in visual assessment to carry out a wind energy project visual assessment'.*

GBD confirm that this LVIA has been prepared by GBD Principal Landscape Architect Andrew Homewood, including site inspections and photomontage photography. Andrew is a Registered Landscape Architect with over 30 years' experience in landscape design and landscape architectural consulting. Andrew has prepared numerous wind and solar farm LVIA in New South Wales and across Australia and provided independent peer reviews for wind farm LVIA on behalf of DPE.

Section 2. Methodology

2.1 Introduction

This LVIA has addressed the key steps and analysis set out in the Bulletin (refer **Figure 1**), and as identified in **Table 2-1**.

2.2 Report structure

This LVIA report has been structured as follows:

Table 2-1 - Report structure

Report section		Description
1	Introduction	This section describes the intent and purpose of the LVIA.
2	Methodology	This section sets out the structure and methodology employed in the LVIA preparation.
3	SEARs and Wind Energy Visual Assessment Bulletin	This section sets out the objectives, stages and key steps described in the SEARs and Bulletin as applicable to this LVIA.
4	Project description	This section describes the wind energy project design, the layout and structural elements.
5	Visual baseline study	This section establishes existing landscape and visual conditions and considers: • Sensitive land use uesignation • Scenic quality classes • Landscape character yype • Key landscape features • Viewpoint inventory and sensitivity levels • Visibility distance zones • Wind resource categories • Wind turbine locations and heights (optional scenarios) and • Other wind farm projects.

Report section		Description
6	Zone of visual influence	This section identifies the overall extent of wind turbine visibility beyond the wind farm site.
7	Visual influence zones	This section establishes the relative landscape significance against which the potential impacts of wind turbines assessed against Table 8 in Appendix 1 of the Bulletin.
8	Visual performance evaluation	This section provides an evaluation of the proposed wind energy project and its various components against the visual performance objectives of the project. Performance objectives include: • Visual magnitude • Landscape scenic integrity • Key feature disruption and • Multiple wind turbine effects.
9	Aviation hazard lighting	This section considers aviation hazard lighting in accordance with the Bulletin.
10	Summary	This section presents a summary of the LVIA key findings.
11	Impact mitigation options	This section considers potential methods of avoiding or minimising potential visual impacts.
12	References	This section lists documents used to inform the preparation of this LVIA report and/or generate sections of this LVIA report.
	Appendix A	Appendix A presents photomontages prepared for the Yanco Delta Wind Farm project.
	Appendix B	Appendix B presents wireframes prepared for the Yanco Delta Wind Farm project.

Section 3. SEARs and Wind Energy Visual Assessment Bulletin

3.1 SEARs

The Yanco Delta Wind Farm SEARs (SSD-41743746) state that the EIS must address Landscape and Visual issues and that:

'including a detailed assessment of the visual impacts of all components of the project (including turbines, transmission lines, substations, battery energy storage system, and any other ancillary infrastructure) in accordance with the NSW Wind Energy: Visual Assessment Bulletin (DPE, 2016), including detailed consideration of potential visual impacts on local residences (including approved developments, lodged development applications and dwelling entitlements), scenic or significant vistas and road corridors in the public domain.'

3.2 Wind Energy Visual Assessment Bulletin

The Bulletin's stated objectives are to:

- *provide the community, industry and decision-makers with a framework for visual impact analysis and assessment that is focused on minimising and managing the most significant impacts*
- *facilitate improved wind turbine and ancillary infrastructure siting and design during the pre-lodgement phase of a project, and encourage early consideration of visual impacts to minimise conflicts and delays where possible, and provide for a better planning outcome*
- *provide the community and other stakeholders with greater clarity on the process along with an opportunity to integrate community landscape values into the assessment process and*
- *provide greater consistency in assessment by outlining appropriate assessment terminology and methodologies.*

GBD confirm that this LVIA has been prepared to satisfy the key objectives of the Bulletin.

The Bulletin breaks the visual assessment process in to 2 main stages. These include:

- Stage 1 Preliminary Environmental Assessment; and
- Stage 2 Assessment and Determination.

Stage 1 was prepared to accompany the Scoping Report in April 2022. This LVIA has been prepared to address the requirements of Stage 2 (EIS), which is to be submitted to DPE (formerly NSW Department of Planning, Industry and Environment) as part of an application for Development Consent. Stage 2 of the EIS must incorporate the following elements:

- *the visual representation of the proposed wind turbine and ancillary infrastructure layout and the visual landscape, including written descriptions, photographs, maps and diagrams*
- *an assessment of the numbers of hours of potential 'shadow flicker'*
- *an assessment of the proposed wind energy project against each visual performance objective and demonstration of whether each objective is achieved and how the standard has been achieved*
- *justification of proposed wind turbines that do not meet the visual performance objectives; and*
- *an outline of any mitigation and management options proposed, including consultation with affected property owners regarding the proposed mitigation works.*

The Bulletin also sets out the basic steps of visual assessment and states the visual assessment process for an EIS comprises three main steps:

- *preparation of visual baseline study inputs, including consulting the community on aspects of the baseline study*
- *establish visual influences zones from viewpoints using data collected in the baseline study and*
- *visual performance evaluation requiring application of visual performance objectives to the proposed wind turbine layout.*

GBD notes the Bulletin nominates 3 distance thresholds for the purpose of visual assessment. As pertaining to the Bulletin Performance Objectives for this LVIA, these include Visual Magnitude distances at 3.6km (black line), 5.3km (blue line) and 8km (Multiple Wind Turbine Tool Analysis). These are further discussed and described in this LVIA. The Bulletin also notes that the distance thresholds are not determinative of acceptability and provide a basis for the assessment to be undertaken. GBD confirm that this LVIA has considered a range of view locations (including dwelling locations) to 10km from wind turbines, as well as key locations beyond 10km as necessary. Several photomontages demonstrate that wind turbines will not be significantly visible from distances beyond 10km, and that existing tree cover is likely to provide effective screening mitigation where present between view locations and wind turbines.

GBD confirms that this LVIA has been prepared in accordance with the Bulletin for Stage 2 EIS (Assessment and determination). **Table 3-1** outlines key requirements set out in the Bulletin and the sections of this LVIA where they have been addressed.

Table 3-1 - Key requirements and LVIA response

Key requirement	LVIA response
the visual representation of the proposed wind turbine and ancillary infrastructure layout and the visual landscape, including written descriptions, photographs, maps and diagrams	Refer LVIA Sections 5 and 6, site photographs and Appendix A Photomontages and Appendix B Wireframes.
an assessment of the numbers of hours of potential 'shadow flicker'	A shadow flicker assessment has not been prepared as wind turbine shadow flicker is not expected to impact dwellings due to distance between non-associated dwellings and wind turbines.
an assessment of the proposed wind energy project against each visual performance objective and demonstration of whether each objective is achieved and how the standard has been achieved	Refer LVIA Sections 7 and 8
justification of proposed wind turbines that do not meet the visual performance objectives	Refer LVIA Section 8
an outline of any mitigation and management options proposed, including consultation with affected property owners regarding the proposed mitigation works	Refer LVIA Sections 8 and 9
preparation of visual baseline study inputs, including consulting the community on aspects of the baseline study	Refer LVIA Sections 4 and 6
establish visual influences zones from viewpoints using data collected in the baseline study	Refer LVIA Section 8
visual performance evaluation requiring application of visual performance objectives to the proposed wind turbine layout	Refer LVIA Section 8

Figure 1
Visual Bulletin Stage 2

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STAGE 1

Scoping and design

- Undertake **community consultation** on likely areas of development and establish key landscape features, areas of scenic quality and key viewpoints valued by the community
- Apply the **Preliminary Assessment Tools** to the preliminary turbine layout
- Prepare a **Preliminary Environmental Assessment**

SEARs

- Submit the Preliminary Environmental Assessment including a map with results of community consultation on landscape values overlayed with the wind resource
- Submit the results of the Preliminary Assessment Tools
- DPE issues **Secretary's Environmental Assessment Requirements** (SEARs) including any project specific requirements

STAGE 2

Prepare EIS

- Prepare a **Visual Baseline Study** as part of the **Environmental Impact Statement** (EIS)
- Undertake community consultation on aspects of the visual baseline study and describe **mitigation and management options** in the EIS
- Establish **Visual Influence Zones** from viewpoints using inputs from the visual baseline study
- Undertake an evaluation of the project against the **Visual Performance Objectives**

Public exhibition

- EIS including the visual assessment is exhibited for a minimum period of 28 days
- Proponent may revise the project in response to issues raised during public exhibition
- Proponent submits a **Response to Submissions report**

Assessment and determination

- DPE undertakes a thorough assessment of the visual impacts of the wind energy project drawing on all relevant information provided through the assessment process
- The consent authority determines the overall acceptability of landscape and visual impacts and balance these matters along with other environmental, social and economic considerations
- The consent authority will consider whether **conditions of consent** should be imposed

Monitoring and compliance

- If the project is approved, DPE is responsible for ensuring that the approved project is constructed and operated in accordance with the conditions of consent

CAMBIUM GROUP
Visual communication science

Source: Wind Energy - Visual Assessment Bulletin, NSW Government (2016), Cambium Group (2022).

Section 4. Project description

4.1 Introduction

Virya Energy Pty Ltd (the Proponent) is seeking approval for the construction, operation, maintenance and decommissioning of the Yanco Delta Wind Farm (the Project).

The Project would extend across two Local Government Areas (LGAs), being the Edward River Council and Murrumbidgee Council LGAs. The southern Project area is located approximately 10km north-west of the Jerilderie township in southwest New South Wales.

The Project regional locality is illustrated in **Figure 2**.

4.2 Project description

The Project would generally involve the construction, operation, maintenance and decommissioning of:

- Up to 208 wind turbines, each consisting of:
  - A generating capacity of up to 8.0 MW each
  - A three-blade rotor and nacelle mounted onto a tower, with a maximum tip height of 270 metres
  - A crane hardstand area
  - A turbine laydown area
- An 800 MW / 800 MWh BESS
- Electrical infrastructure, including:
  - A central primary substation
  - Up to eight collector substations and associated 66 kV or 132 kV overhead power lines
  - Underground and/or overhead 33 kV or 66 kV power lines to transmit the electricity generated by the wind turbines to the substations and/or the BESS
  - An overhead 330 kV or 500 kV transmission line to connect the central primary substation to Dinawan Terminal Station via McLennons Bore Road and Cadel Road
- Permanent ancillary infrastructure, including:
  - An operation and maintenance facility, including site offices and car park
  - Up to eight permanent meteorological masts, located close to a wind turbine location, with a maximum height of 180 metres
  - Internal access tracks to wind turbines and substations
- Temporary construction facilities including:
  - One construction compound with laydown areas
  - Stockpile areas
  - Up to two concrete batch plants adjacent to the construction compound
  - Gravel borrow pits (if feasible).
- Upgrades to local roads and crossings where required for the delivery, installation and maintenance of wind turbine components and associated materials and structures.

The wind turbines extend across two broad clusters to the north and south of Yanco Creek with 175 wind turbines in the northern cluster and 33 in the southern cluster. The conceptual project layout is shown in **Figure 3**.

Figure 2
Regional context

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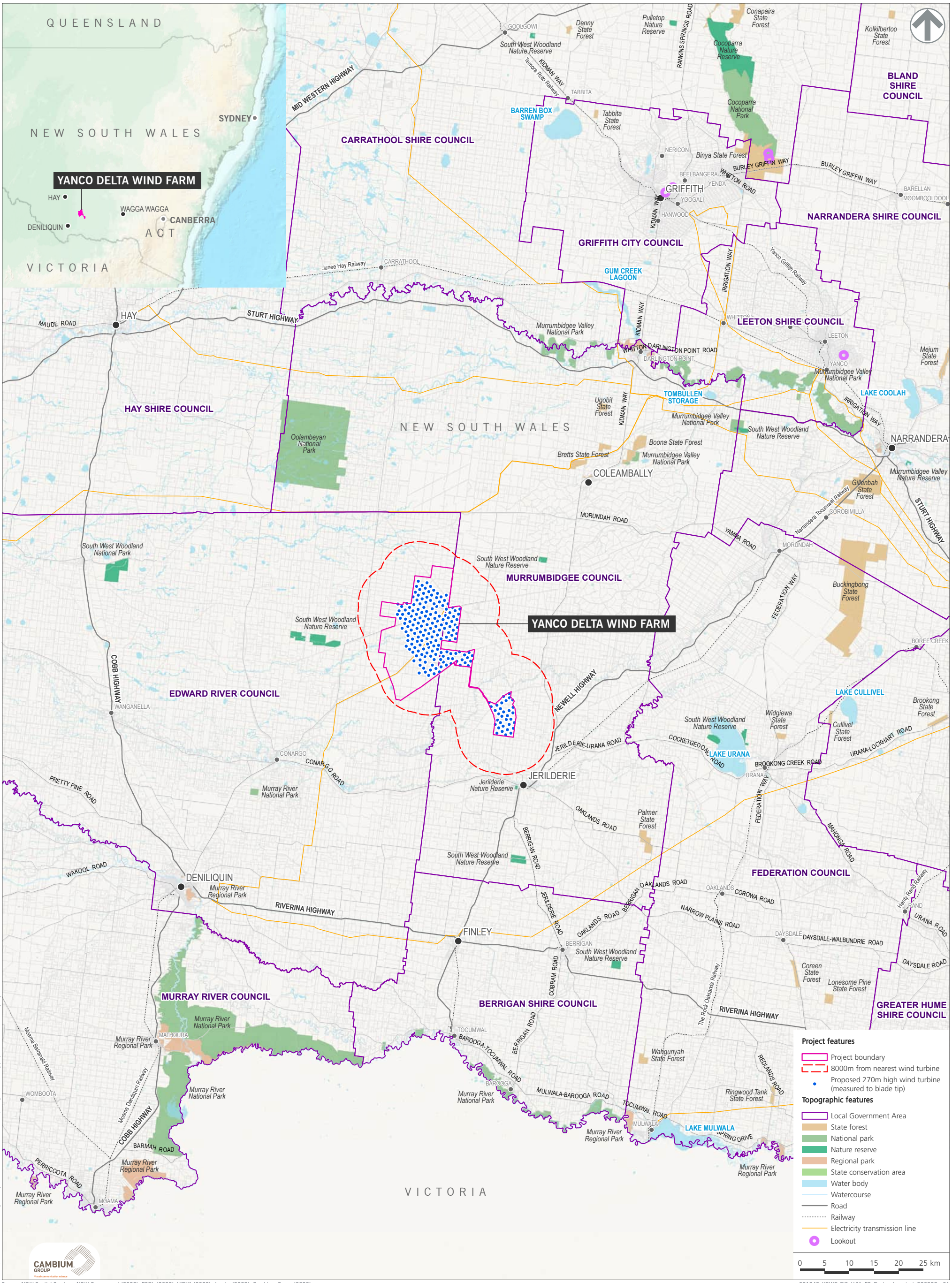

Source: NSW Spatial Services, NSW Government (2022), ESRI, (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

Figure 3
Project layout

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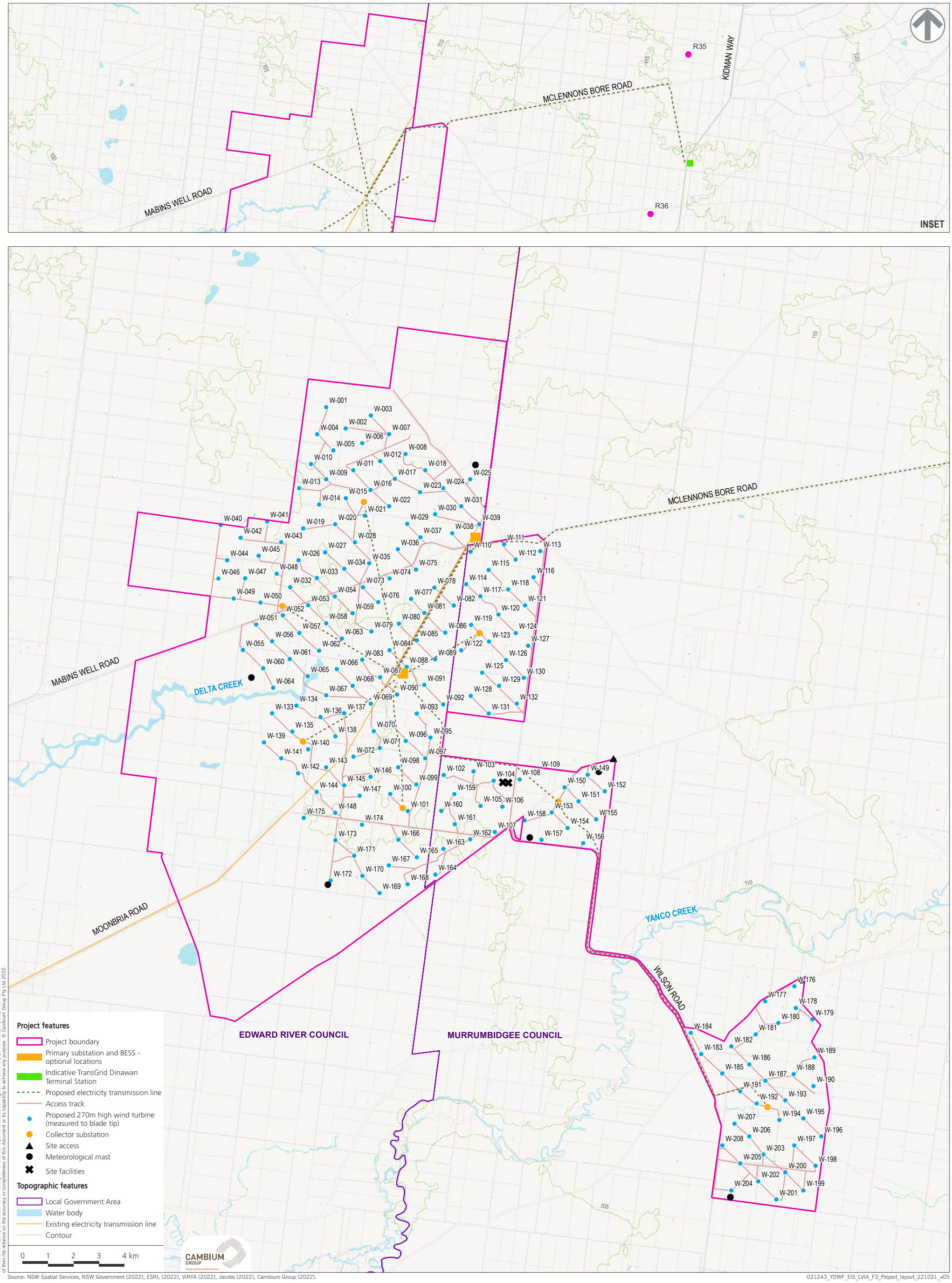


Source: NSW Spatial Services, NSW Government (2022), ESRI, (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

Plate 1 – Typical wind turbines (Senvion 3XM) 211m tip height, Murra Warra VIC (Image: ©GBD Pty Ltd 2022)Plate

4.3 Wind turbines

The constructed elements of wind turbines typically comprise:

- Concrete foundations
- Tubular tapering steel and/or concrete towers
- Nacelles at the top of the tower housing electrical generator and gearbox (depending on design)
- A hub attached to the nacelle with three blades attached and
- Three composite material blades attached to the hub.

The main components of a typical wind turbine are illustrated in **Plate 1** above and **Diagram 1**.

4.4 Aviation obstacle lighting

This LVIA has reviewed and responded to the Bulletin Aviation Hazard Lighting performance objectives (refer Section 9).

4.5 Wind monitoring masts

Up to 8 permanent wind monitoring masts would be installed on-site, generally extending up to the wind turbine hub height. The permanent wind monitoring masts are expected to be of a guyed, narrow lattice or tubular steel design (refer **Plate 13**).

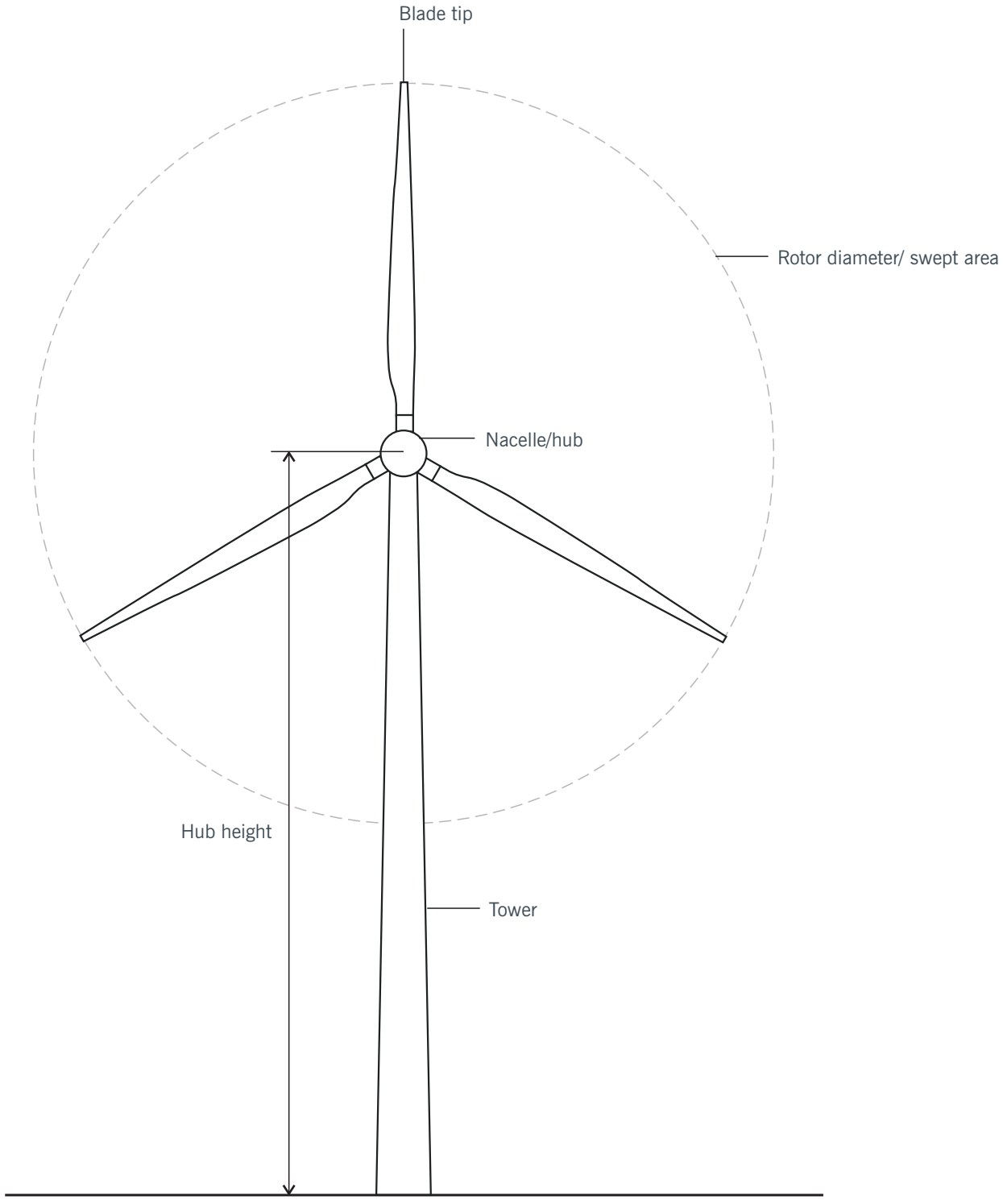
The permanent wind monitoring masts would not create a significant visual impact in the context of the overall wind farm development.

4.6 On-site access roads

The onsite access road layout will be designed to utilise existing tracks and consider the topography of the land, reducing the need for vegetation clearing, minimising the amount of land required for access where possible. It is likely that approximately 270km of access roads will be required within the Project area. The following design criteria were applied to the access road and access corridor layout to minimise impacts:

- The access roads will typically be 5m wide. The access road design is developed on several environmental grounds, including minimising the potential for visual impact by considering:
- Overall length and extent
- Use of existing farm track routes
- Need for clearing vegetation
- Potential for erosion
- Extent of cut and fill and
- Potential to maximise rehabilitation at the completion of the construction phase.

Diagram 1 – Typical wind turbine components and terminology (Image: ©GBD Pty Ltd 2022)



4.7 Electrical services plan and infrastructure

The wind turbines would be connected to the TransGrid Dinawan Terminal Station which would connect to the national electricity grid. The electrical works would generally include:

- Central primary substation to step the voltage up from the reticulation voltage to the transmission voltage suitable for connection to the TransGrid Dinawan Terminal Station. Two possible locations have been selected within the Project area
- An 800 MW/ 800 MWh BESS located at the central primary substation
- Up to eight collector substations
- About 287km of 33kV or 66 kV electrical cabling to connect wind turbines to each other and the closest collector substations. The majority of the electrical cabling would be underground and along proposed access tracks (where possible).
- About 60km of overhead 33kV or 66kV power lines connecting each collector substation to the central primary substation
- A 330kV or 550kV overhead transmission line extending generally east from the central portion of the northern wind turbine cluster alongside the McLennons Bore Road toward the Kidman Way, turning south alongside Cadell Road before connecting to the TransGrid Dinawan Terminal Station
- Onsite underground control and communications cabling between the wind turbines and the substation.

Indicative locations for the primary and collector substations, the BESS and overhead transmission line connection to the Dinawan Terminal Station are shown on the conceptual project layout **Figure 3.**

4.8 Construction

There are potential visual impacts that could occur during the construction phase of the project. The key construction activities that will be visible from areas surrounding the Project include:

- Ongoing detailed site assessment including sub-surface geotechnical investigations
- Excavation and earthworks
- Various civil works to upgrade local roads, access roads and entry point
- Construction facilities, including construction compound and operation and maintenance facility, compound buildings, portable structures and laydown areas
- Various construction and directional signage; and
- Construction activities associated with erection of wind turbines, permanent monitoring masts, BESS facility and primary and collector substations with associated electrical infrastructure/transmission line works.

Most of the construction activities, some of which will result in physical changes to the landscape, are generally temporary in nature and are typically restricted to various discrete areas within or just beyond the immediate Project area. Most construction activities will be unlikely to result in an unacceptable level of visual impact given their duration and temporary nature. Typical constructed elements and facilities associated with a wind farm development are illustrated in **Plate 2** to **Plate 12**.

Plate 2 – Typical substation facility, Hornsdale SA (Image: ©GBD Pty Ltd 2018)

Plate 3 – Typical O&M/substation facility, Murra Warra Wind Farm VIC (Image: ©GBD Pty Ltd 2022)

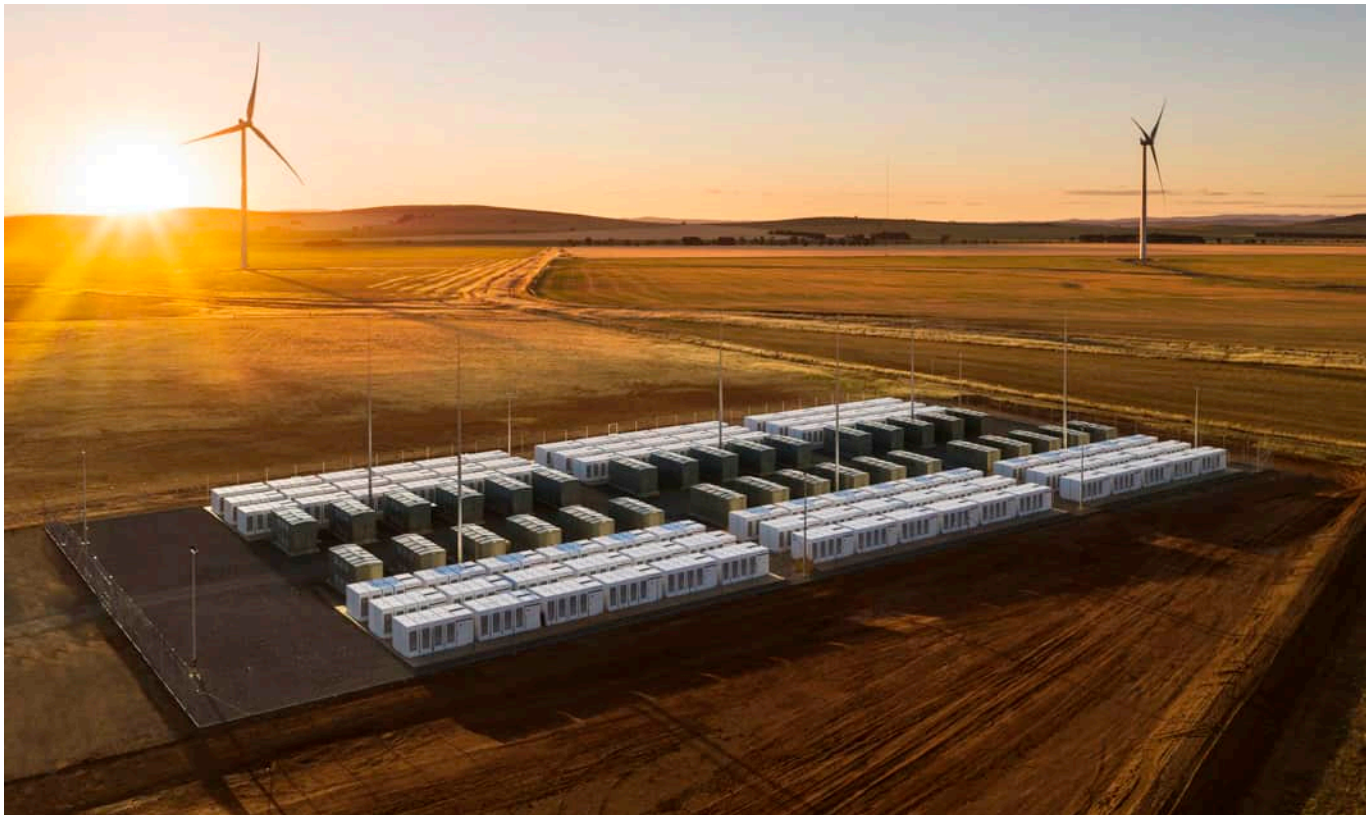


Plate 4 – Typical battery storage facility, Hornsdale SA (Image: ©Neoen Australia Pty Ltd 2017)

Plate 5 – Typical battery storage facility, Hornsdale SA (Image: ©GBD Pty Ltd 2018)

Plate 6 – Typical maintenance facility and car park, White Rock Wind Farm NSW (Image: ©GBD Pty Ltd 2018)

Plate 7 – Site entry signage, Murra Warra Wind Farm VIC (Image: ©GBD Pty Ltd 2022)

Plate 8 – Wind farm construction, Murra Warra Wind Farm VIC (Image: ©GBD Pty Ltd 2019)

Plate 9 – Cable laying, Crookwell 2 Wind Farm NSW (Image: ©GBD Pty Ltd 2018)

Plate 10 – Crane at Crookwell 2 Wind Farm NSW (Image: ©GBD Pty Ltd 2018)

Plate 11 – Internal access road at Murra Warra Wind Farm VIC (Image: ©GBD Pty Ltd 2022)

Plate 12 – 330kV transmission line structure at Murra Warra Wind Farm VIC (Image: ©GBD Pty Ltd 2022)

Plate 13 – Typical wind monitoring mast at proposed Kentbruck Wind Farm VIC (Image: ©GBD Pty Ltd 2022)

Section 5. Visual baseline study

5.1 Introduction

A visual baseline study has been undertaken to establish the existing landscape and visual conditions in accordance with the Bulletin. The Bulletin states the LVIA should consider the following inputs in the visual catchment for the Project:

- *elements of the landscape important to the community, including public and private viewpoints*
- *the sensitivity of the viewers who use those viewpoints, and the distances at which they may view the landscape and potential wind turbines and other ancillary facilities*
- *the character of the landscape involved, its key features and the relative scenic quality of the area and*
- *the location of any existing operational or approved wind energy projects within both a regional and local context, including any nearby surrounding wind energy projects within eight kilometres which may have the potential to create direct or indirect visual impacts between the proposed and any other operational, approved or proposed wind energy projects.*

5.2 Sensitive land use designation and land use zones

The Bulletin identifies Sensitive Land Use Designations (SLUDs) as:

- *the applicable land use zone and primary nature of the land use (agricultural, industrial, rural residential), including identification of sensitive land use designations. Sensitive land use designations are those types of land uses that wind energy proponents should be aware of when designing the project. Particularly sensitive land uses include those sites listed at the National and State level such as heritage sites and impacts on these sites should be minimised.*

SLUDs surrounding the Project area have been identified and presented in **Figure 4**. Only RU1 – Primary Production under both the Conargo Local Environmental Plan (LEP) and the Murrumbidgee LEP occurs within the Project area. Other SLUDs and landuse zones illustrated in **Figure 4** surrounding the Project area include:

- E1 - National Parks and Nature Reserves
- RE1 – Public recreation
- SP2 - Infrastructure
- R5 – Large lot residential (beyond 10km)
- IN1 – General industrial.

5.3 Scenic quality classes

Introduction

The Bulletin states that '*In order to assess and map scenic quality classes (i.e., high, moderate and low), a descriptive scenic quality "frame of reference" will need to be developed that is suitable for identifying those landforms, vegetation, waterform and, sometimes, cultural features that may be considered to be scenically outstanding or of high quality for the area. The frame of reference can categorise features that are more commonly occurring or of moderate scenic quality and those that may be considered low or below the average for the area due to their lack of variety, distinctiveness or their degree of alteration'.*

Figure 4
Zoning

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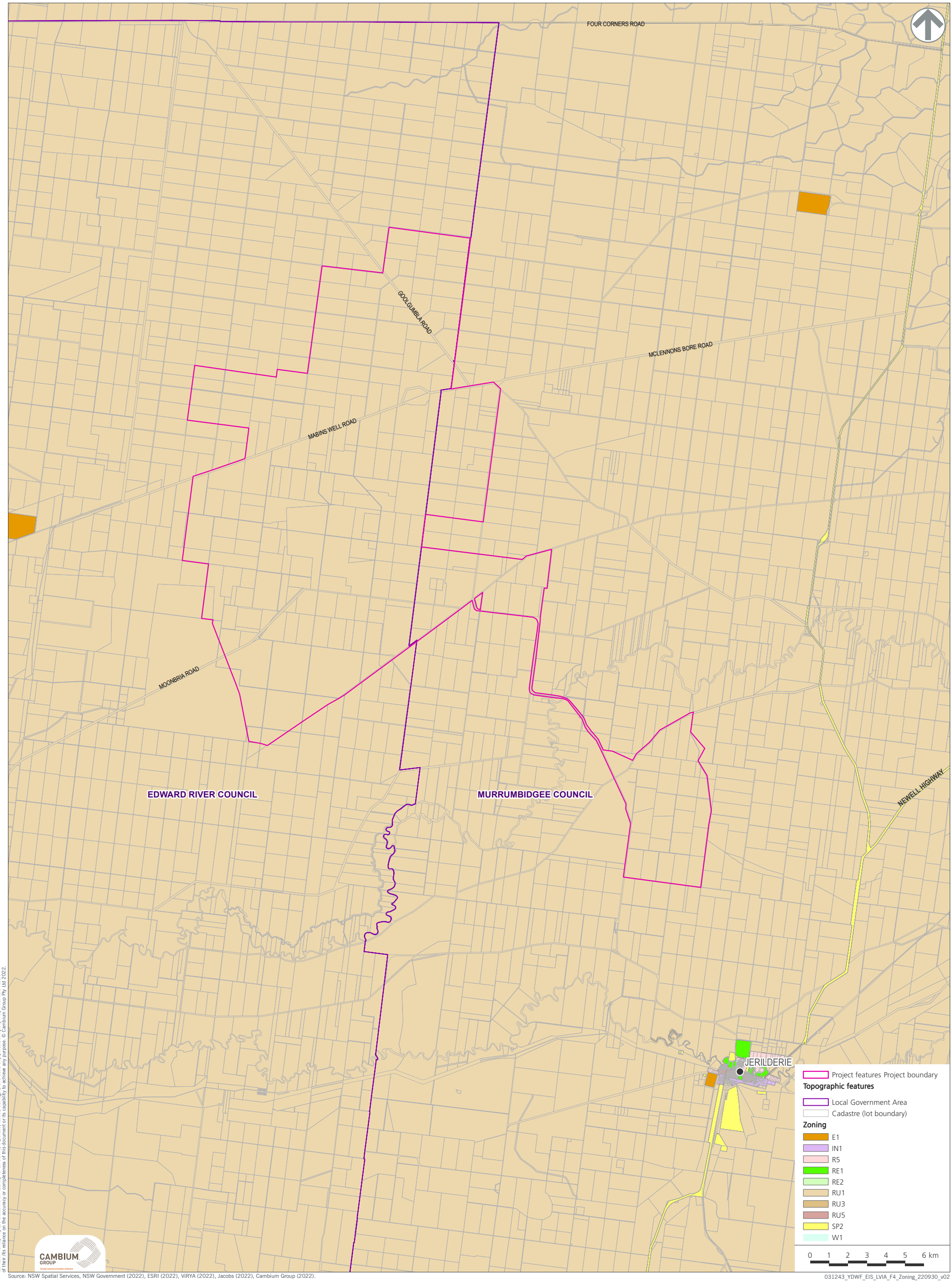

Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

5.4 Landscape character and key landscape features

The Project area is located within the Riverina Bioregion as delineated in the Interim Biogeographic Regionalisation for Australia (IBRA) Version 7, and within the Murrumbidgee Subregion. The following Scenic Quality frame of reference has been derived from landscape character data for the Murrumbidgee Subregion.

Table 5-1 - Scenic quality frame of reference

Description	High scenic quality	Moderate scenic quality	Low scenic quality
Landforms	Wider floodplains with meandering channels, billabongs, levees and low dunes. Large overflow lakes with large lunettes.	Alluvial fans with distributary channels and floodplains, undulating plains with depressions.	Large expanses of indistinctly dissected or unbroken landforms that provide little illusion of spatial definition or landmarks with which to orientate.
Vegetation	Strongly defined patterns with combinations of forest, river and creekside vegetation and saltbush across backplain with white cypress on dunes. Distinctive stands of vegetation that may create unusual forms, colours or textures in comparison to surrounding vegetation.	Predominantly open forest or woodland combined with some natural openings in patterns that offer some visual relief. Floodplain vegetative stands that exhibit a range of size, form, colour, texture and spacing.	Extensive areas of similar vegetation, such as grasslands, pasture or with very limited variation in colour and texture.
Waterform	Visually prominent lakes, reservoirs, rivers, streams and swamps.	Intermittent streams, lakes, rivers, swamps and reservoirs.	Waterform absent.

Table 5-1 includes a frame of reference specific to the Yanco Delta Project area and is not considered applicable to other wind farm projects. Landscape characteristics must be established on a project-by-project basis as relevant to landscapes surrounding projects.

To support the Visual Baseline Study, GBD has prepared figures to illustrate landscape character within and surrounding the Project area. The figures detail landscape characteristics and key landscape features associated with Scenic Quality frame of reference. The landscape characteristics are generally defined by land use, land cover and topography and have been combined to form Landscape Character Units (LCU) to inform a Scenic Quality Class of High, Moderate or Low. The LVIA identified six LCU within and surrounding the Project area. These included:

- LCU1 - Township
- LCU2 - Agricultural (cultivated)
- LCU3 - Creek and billabong
- LCU4 - Transmission line corridor
- LCU5 - Road corridor
- LCU6 - Floodplain and backplain

The LCU localities are illustrated in Figure 5 and in the photograph images illustrated in Figure 6 to Figure 11.

The LCU have been selected to assist in the description of the existing landscape character type and used during the performance evaluation phase to assess to what extent the existing landscape character may potentially be modified by the proposed project.

Figure 5

Scenic quality assessment - Landscape character areas

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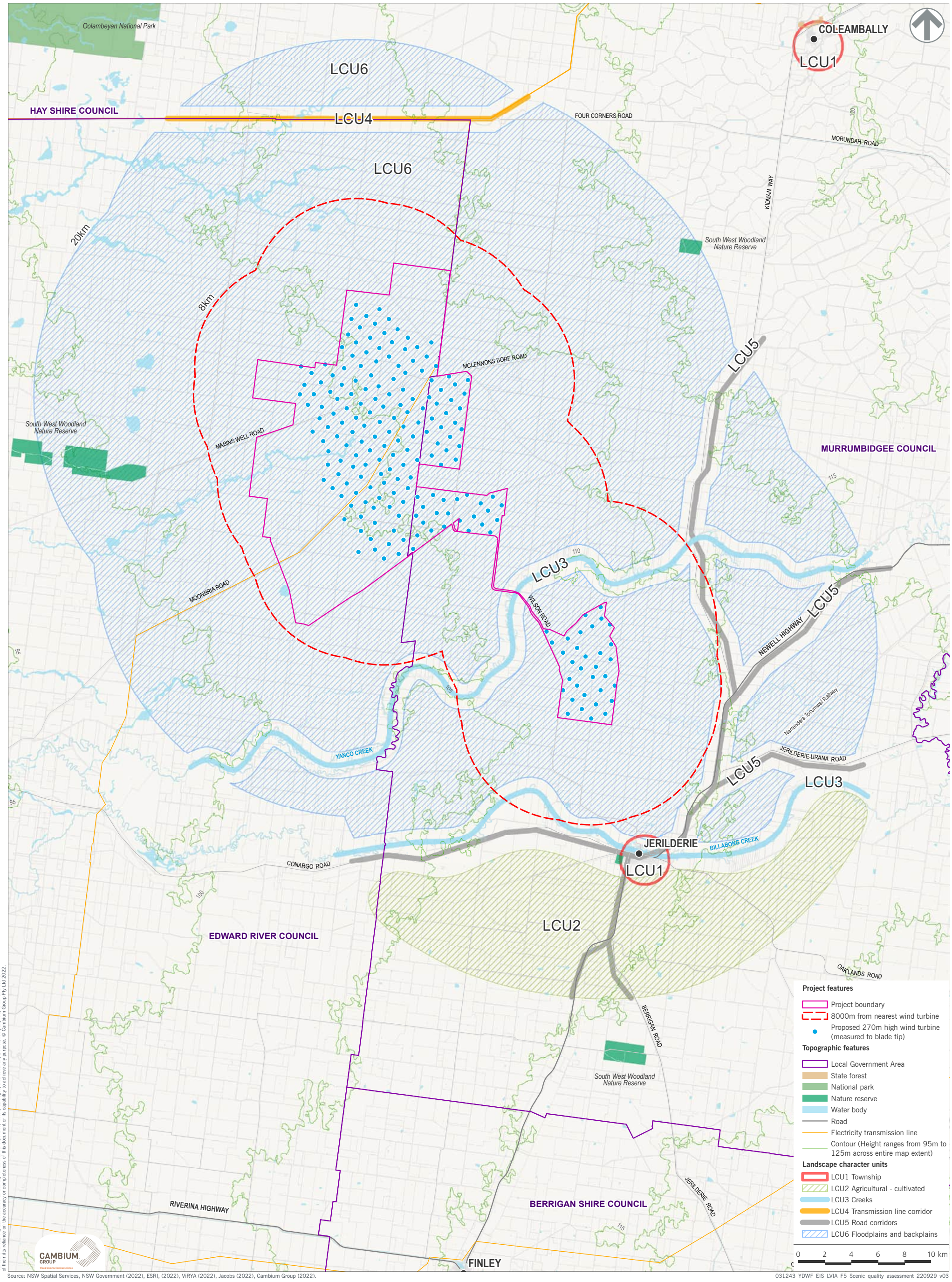

Source: NSW Spatial Services, NSW Government (2022), ESRI, (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

Figure 6

Landscape character unit 1 - Township (Jerilderie)

Townships and localities, including Jerilderie around 10km south of the Project area, are located in generally flat landscapes, in proximity to landscape features such as creeks and rivers.

Townships and localities include a range of built structures such as dwellings, commercial buildings and public facilities. Built structures are moderate to small in scale with a varied colour palette.

Visual connectivity between townships and the surrounding landscape is partially restricted and disrupted by tree planting within urban areas and extensive tree cover alongside creeks and drainage lines.

Townships and localities do not tend to include elements or features which might be considered significant or high scenic quality at a national or state level. Notwithstanding, townships and localities do contain elements which may have local visual and historical significance.

Source: Green Bean Design (2022), Cambium Group (2022).

Figure 7

Landscape character unit 2 - Agriculture (cultivated)

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Agriculture (cultivated) landscapes tend to extend beyond townships and localities and are often associated with creeks and irrigation channels. Cultivated landscapes present as moderate to large visual elements broken by field boundaries, roads and occasional tree cover.

Constructed elements within cultivated landscapes include roads and tracks, agricultural buildings such as silos and sheds as well as rural dwellings and homesteads.

Visual connectivity extends beyond the cultivated landscapes to adjoining and more distant views across floodplains and backplains.

Cultivated landscapes do not generally exhibit features which tend to result in significant or high levels of scenic quality.

Source: Green Bean Design (2022), Cambium Group (2022).

Figure 8

Landscape character unit 3 - Creek and billabong

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Creeks and smaller ephemeral drainage lines occur across the landscape within and beyond the Project area. Principal waterways include Billabong Creek to the south of the Project area (adjoining Jerilderie), Yanco Creek which flows through the south portion of the Project area and Delta Creek which flows through the northern portion of the Project area. Creek lines meander in a general east to west direction often within corridors of former channels and billabong.

Built structures are largely absent except where creeks adjoin townships such as Jerilderie. Creek and drainage lines are visually marked in the landscape by trees growing along drainage corridors.

Creek lines provide opportunities for visual relief against large extents of floodplain and backplain backdrops. Creek lines are considered to provide landscape elements of moderate scenic quality.

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Source: Green Bean Design (2022), Cambium Group (2022).

Figure 9

Landscape character unit 4 - Transmission line corridor

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A short section of transmission line corridor extends east to west through the north portion of the Project area. The transmission line corridor extends across open pasture and through easements created within existing tree and shrub vegetation.

Transmission line structures do not form visually prominent features within the landscape and are not considered to contribute to surrounding scenic quality.

Source: Green Bean Design (2022), Cambium Group (2022).

CAMBIUM GROUP

Figure 10

Landscape character unit 5 - Road corridor

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Road corridors extend through the landscape connecting townships and localities north and south of the Project area. Principal road corridors include the Kidman Way to the east of the Project area and the Newell Highway extending north east away from the Project area. A small number of local and largely unsealed roads extend through the Project area providing access to rural dwellings and farms.

Roads form small scale built elements within the landscape and provide a range of direct and indirect transitory views toward the Project area as well as moderate to long views along road corridors. Road corridors are occasionally framed by tree and shrub vegetation screening and filtering views to the surrounding landscape.

Source: Green Bean Design (2022), Cambium Group (2022).

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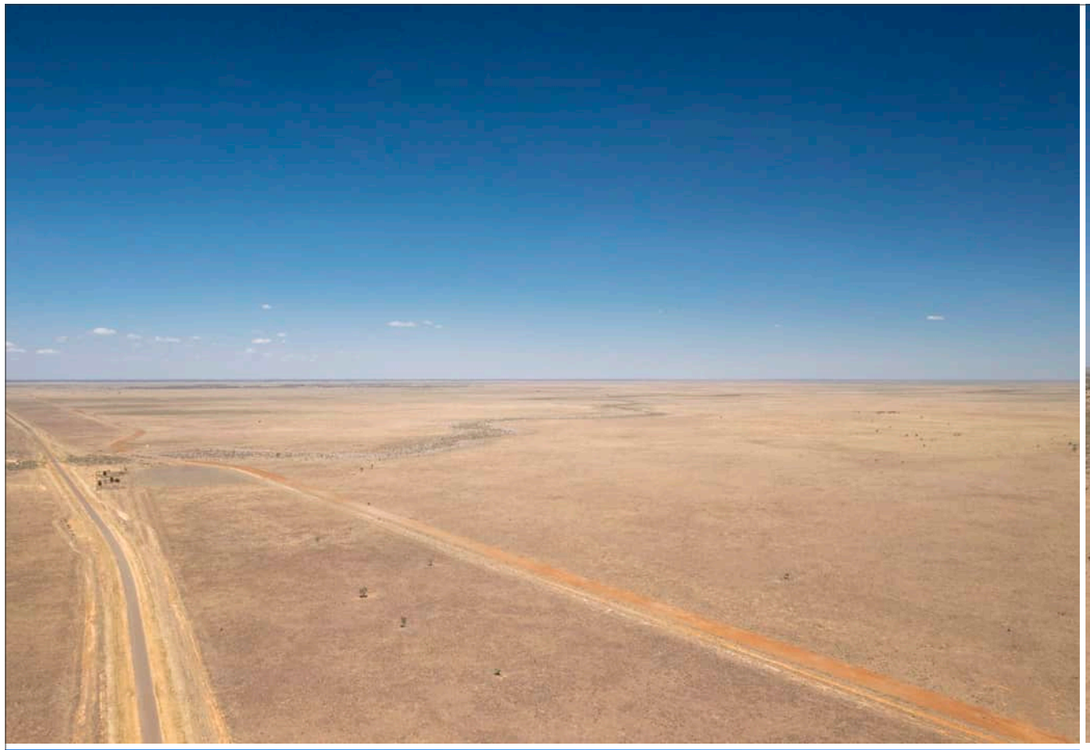
Figure 11

Landscape character unit 6 - Floodplain and backplain

GBD Landscape architecture



Areas of floodplain and backplain are generally flat and visually large scale landscapes that extend across a large portion of the Project area extending toward distant horizon lines.

As part of the extensive Murray Basin alluvial fans, the floodplain and backplain contain a range of landscape features such as meandering channels, floodplain, dunes, overflow lakes and swamps.

Landcover largely comprises pasture interspersed with scattered tree and denser forested areas. Areas of vegetation also comprise shrub and saltbush cover.

Constructed elements within areas of floodplain and backplain include occasional sealed road and unsealed tracks, rural dwellings and agricultural structures.

The landscape offers open and distant views toward and beyond other landscape character units with screening and filtering of views provided by vegetation within proximity to drainage channels and overflow lakes.

Floodplain and backplain are considered to provide landscape elements of moderate scenic quality.

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Source: Green Bean Design (2022), Cambium Group (2022).

5.4.1 Landscape character unit 1 - Township

Townships and localities, including Jerilderie around 10km south of the Project area, are located in generally flat landscapes, in proximity to landscape features such as creeks and rivers. Townships and localities include a range of built structures such as dwellings, commercial buildings and public facilities. Built structures are moderate to small in scale with a varied colour palette.

Visual connectivity between townships and the surrounding landscape is partially restricted and disrupted by tree planting within urban areas and extensive tree cover alongside creeks and drainage lines. Townships and localities do not tend to include elements or features which might be considered significant or high scenic quality at a national or state level. Notwithstanding, townships and localities do contain elements which may have local visual and historical significance.

Landscape Character Options:

- Urban elements
- Natural Appearing (creek and billabong)
- Cultural (minor)

Scenic quality assessment - moderate

5.4.2 Landscape character unit 2 - Agricultural (cultivated)

Agriculture (cultivated) landscapes tend to extend beyond townships and localities and are often associated with creeks and irrigation channels. Cultivated landscapes present as moderate to large visual elements broken by field boundaries, roads and occasional tree cover. Constructed elements within cultivated landscapes include roads and tracks, agricultural buildings such as silos and sheds as well as rural dwellings and homesteads. Visual connectivity extends beyond the cultivated landscapes to adjoining and more distant views across floodplains and backplains. Cultivated landscapes do not generally exhibit features which tend to result in significant or high levels of scenic quality.

Landscape character options:

- Natural appearing
- Agricultural
- Cultural (minor)

Scenic quality assessment – low to moderate

5.4.3 Landscape character unit 3 - Creek and billabong

Creeks and smaller ephemeral drainage lines occur across the landscape within and beyond the Project area. Principal waterways include Billabong Creek to the south of the Project area (adjoining Jerilderie), Yanco Creek which flows between the north and south portions of the Project area, Delta Creek which flows through the northern portion of the Project area and Turn Back Jimmy Creek which flows through the southern portion of the Project area. Creek lines meander in a general east to west direction often within corridors of former channels and billabong. Built structures are largely absent except where creeks adjoin townships such as Jerilderie. Creek and drainage lines are visually marked in the landscape by trees growing along drainage corridors. Creek lines provide opportunities for visual relief against large extents of floodplain and backplain backdrops. Creek lines are considered to provide landscape elements of moderate scenic quality.

Landscape character options:

- Natural appearing
- Riverine
- Cultural (minor)

Scenic quality assessment – moderate

5.4.4 Landscape character unit 4 - Transmission line corridor

A short section of an existing transmission line corridor extends east to west through the north portion of the Project area. The transmission line corridor extends across open pasture and through easements created within existing tree and shrub vegetation. Transmission line structures do not form visually prominent features within the landscape and are not considered to contribute to surrounding scenic quality.

Landscape character options:

- Industrial modification
- Power generation
- Scenic Quality Assessment – Low

5.4.5 Landscape character unit 5 - Road corridor

Road corridors extend through the landscape connecting townships and localities north and south of the Project area. Principal road corridors include the Kidman Way to the east of the Project area and the Newell Highway extending north east away from the Project area. A small number of local and largely unsealed roads extend through the Project area providing access to rural dwellings and farms. Roads form small scale built elements within the landscape and provide a range of direct and indirect transitory views toward the Project area as well as moderate to long views along road corridors. Road corridors are occasionally framed by tree and shrub vegetation screening and filtering views to the surrounding landscape.

Landscape character options:

- Constructed infrastructure
- Transportation and travel
- Cultural routes and connections

Scenic quality assessment – Low to Moderate

5.4.6 Landscape character unit 6 - Floodplain and backplain

Areas of floodplain and backplain are generally flat and visually large-scale landscapes that extend across a large portion of the Project area extending toward distant horizon lines. As part of the extensive Murray Basin alluvial fans, the floodplain and backplain contain a range of landscape features such as meandering channels, floodplain, dunes, overflow lakes and swamps. Landcover largely comprises pasture interspersed with scattered tree and denser forested areas. Areas of vegetation also comprise shrub and saltbush cover. Constructed elements within areas of floodplain and backplain include occasional sealed road and unsealed tracks, rural dwellings, and agricultural structures. The landscape offers open and distant views toward and beyond other landscape character units with screening and filtering of views provided by vegetation within proximity to drainage channels and overflow lakes. Floodplain and backplain are considered to provide landscape elements of moderate scenic quality.

Landscape character options:

- Natural appearing
- Rural pastoral
- Cultural (minor)

Scenic quality assessment – moderate

5.5 Viewpoint inventory and sensitivity level

A viewpoint inventory and sensitivity map illustrating public and private viewpoints of Level 1 to Level 3 sensitivity is presented in **Figure 3**. Sensitivity levels have been applied in accordance with the Bulletin Table 5 Viewer Sensitivity Level classification of travel routes and use areas.

Table 5-2 - Viewpoint inventory and sensitivity level

Viewer Sensitivity Level	Travel routes and use areas
Level 1 sensitivity (High)	• Residential areas and rural villages *(defined as land zoned R1, R2, R3, R4, R5 and RU5 in the Standard LEP)* • Recreation, cultural or scenic sites and viewpoints of National or State significance. • Any buildings, historic rural homesteads/ residences on the State or local Government Heritage List
Level 2 sensitivity (Moderate)	• Rural dwelling • Tourist and visitor accommodation (definition in Standard Instrument Local Environmental Plan) • Recreation, cultural or scenic sites and viewpoints of regional significance
Level 3 sensitivity (Low)	• Interstate and state passenger rail lines with daily daylight services • State highways, freeways and classified main roads, classified tourist roads • Land management roads with occasional recreation traffic • Walking tracks of moderate local significance or infrequent recreation usage • Other low use and low concern viewpoints and travel routes • Navigable waterways

Source: The Visual Bulletin, 2016 (Table 5 Viewer Sensitivity Level classification)

5.6 Visibility distance zones

The Bulletin states that *'the relative apparent size (visual magnitude) of wind turbines decrease with distance. Visibility or viewshed mapping is usually performed using GIS analysis of terrain contours when assessing what may be visible from a given viewpoint looking in selected directions or in 360°. This mapping can also be calibrated to map the distance zones for the visible areas, while distinguishing those areas that are unseen from the selected viewpoint'.*

Visibility distance zones have been applied to the visual analysis of the Project in accordance with the Bulletin *(Table 6 Visibility distance zones)* and are noted for each viewpoint included in the Performance Objectives Evaluation.

Visibility distance zones are described in **Figure 15** Visual influence zone matrix (**Section 8**).

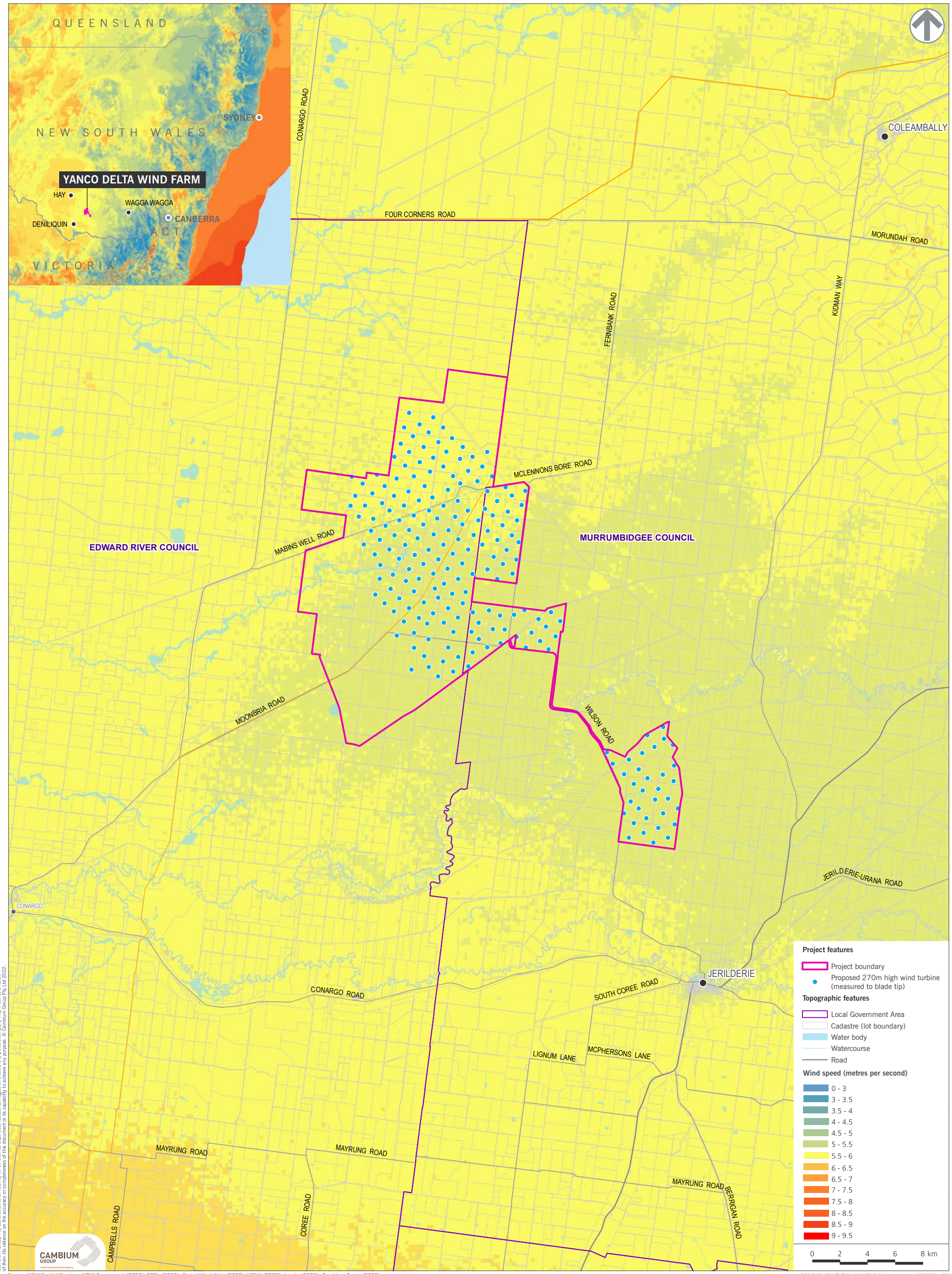
5.7 Wind resource categories

The Bulletin requires a *'map showing the relative wind resources of the proposed development area expressed as relative ranges of average wind strength in metres per second'.*

A Wind Resource Map has been prepared and is presented in

Figure 12
Wind resource

GBD
Landscape architecture



Source: NSW Spatial Services, NSW Government (2022), ESRI, (2022), Global Wind Atlas (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

5.8 Other wind farms and large-scale infrastructure projects

- There are a number of approved and proposed renewable energy and electrical infrastructure projects within the broader Riverina region. These include:
- Dinawan Energy Hub (Announced) within 8km of the Yanco Delta Project area.
- Bullawah Wind Farm (Announced), around 10km north west of the Yanco Delta Project area
- Victoria to NSW Interconnector West (VNI West) (Announced) around 14km north of the Yanco Delta Project area
- Project EnergyConnect (Eastern) (Approved) around 14km north of the Yanco Delta Project area
- Micro Solar Farm, Coleambally (Approved) around 41km north east of the Yanco Delta Project area
- Coleambally BESS, Coleambally (Planning) around 45km north east of the Yanco Delta Project area
- Woodland BESS, Darlington Point (Planning) around 58km north east of the Yanco Delta Project area
- Riverina and Darlington Point BESS, Darlington Point (Approved) around 58km north east of the Yanco Delta Project area
- Baldon Wind Farm (Planning) around 120km north west of the Yanco Delta Project area
- Keri Keri Solar Farm (Planning) around 135km north west of the Yanco Delta Project area
- Keri Keri Wind Farm (Planning) around 135km north west of the Yanco Delta Project area

Most of these projects, and specifically those located beyond 30km of the Yanco Delta Project area, would be unlikely to have any direct visual connection with the Yanco Delta Wind Farm.

Whilst other wind farm projects are at various stages of development within proximity to the Yanco Delta Wind Farm project, there is limited publicly available information, and no detailed data that would be required to prepare a multiple wind turbine tool analysis against other wind farm projects, or to make considered judgements on potential cumulative visual effects.

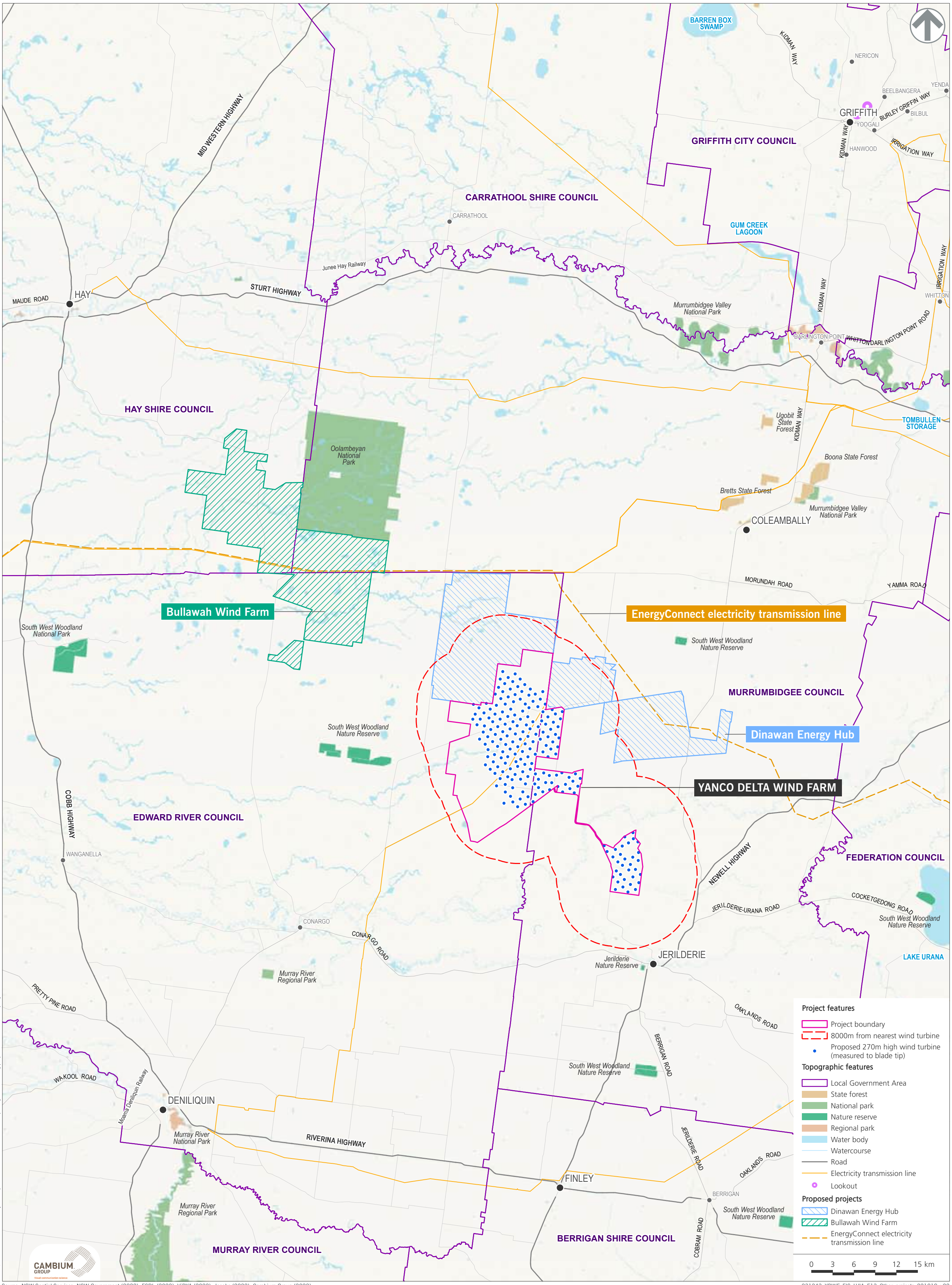
This LVIA has not identified any other approved or operating wind farm projects within 8km of the proposed Yanco Delta Wind Farm Project area or within the broader regional area.

Figure 13 illustrates the indicative location of the proposed Bullawah and Dinawan Energy Hub wind farm projects which may include views toward wind turbines within 8km of the Yanco Delta wind turbines.

Figure 13
Other projects

GBD
Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



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Source: NSW Spatial Services, NSW Government (2022), ESRI, (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F13_Other_projects_221019_v02

Section 6. Zone of visual influence

6.1 Introduction

Zone of Visual Influence (ZVI) diagrams are used to identify theoretical areas of the landscape from which wind turbines, or portions of turbines, could be visible from the surrounding landscape. They are useful for providing an overview as to the extent to which the Project wind turbines may be visible from surrounding view locations and can be used to focus site inspections works.

6.2 ZVI methodology

The methodology adopted for the ZVI is a purely geometric assessment where the visibility of the Project is determined from carrying out calculations based on a digital terrain model of the site and the surrounding terrain.

Calculations have been made to determine the visibility of the wind turbines to blade tips (essentially a view toward any part of the wind turbine rotor, including views toward the tip of blade). The calculations also take into account the terrain relief and earth curvature. This assessment methodology is considered to be very conservative as:

- The screening effects of any structures and vegetation above ground level are not considered in any way. Therefore the wind turbines may not be visible at many of the locations indicated on the ZVI diagrams due to the local presence of trees or other screening materials.
- Additionally, the number of turbines visible is also affected by the weather conditions at the time. Inclement or cloudy weather tends to mask the visibility of the proposed wind project.

Accordingly, while ZVI diagrams are a useful visualisation tool, they are very conservative in nature.

6.3 ZVI summary

A ZVI diagram has been prepared to illustrate wind turbine visibility from the tip of blade height. The extent to which the wind turbines may be visible is illustrated in **Figure 14**.

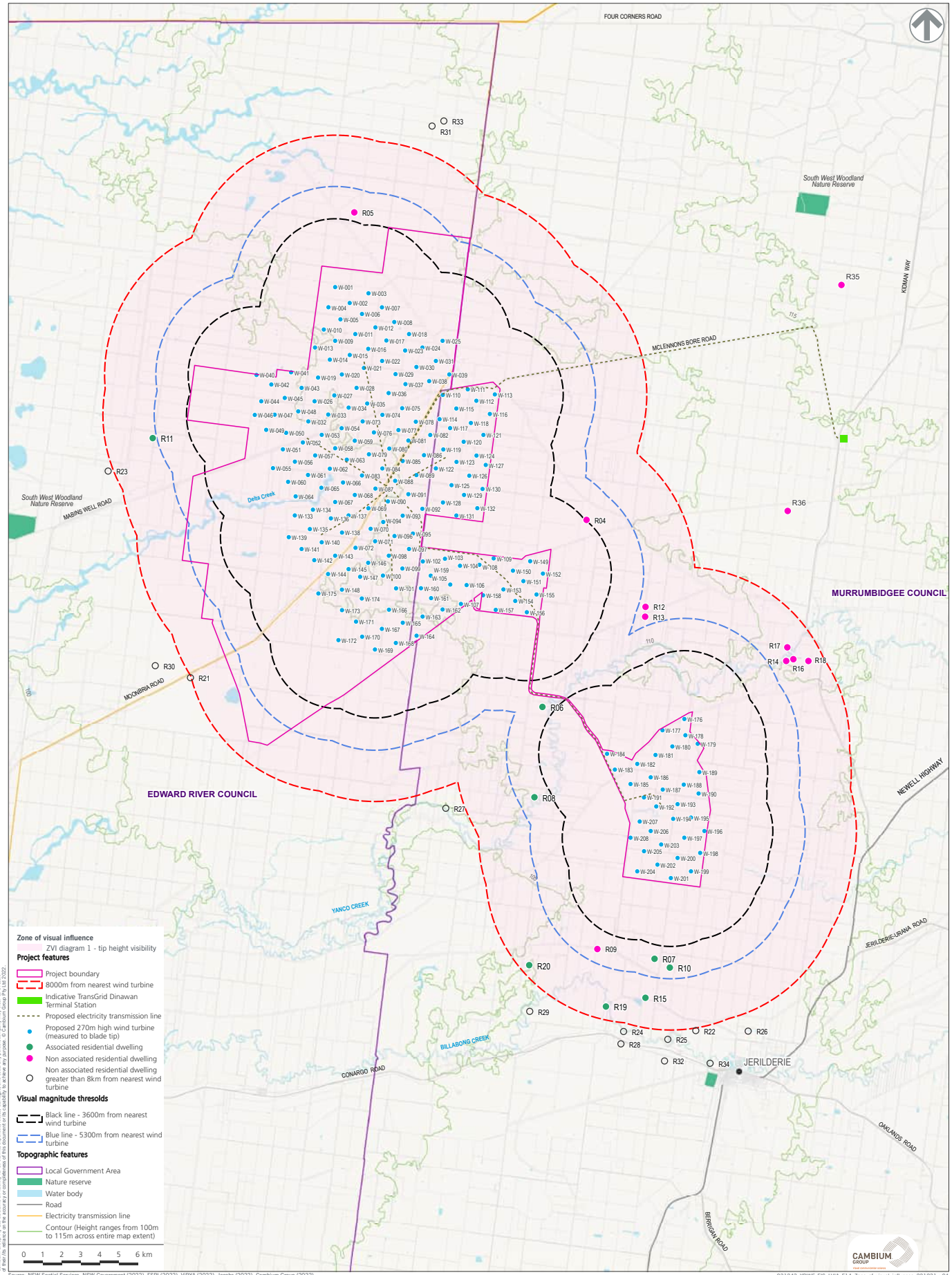
The ZVI diagram illustrates areas of landscape which are likely to offer views toward the wind turbines and demonstrate that most views generally occur within private property and across large tracts of unoccupied rural landscape. Given the flat landform character of the Project area and surrounding landscape the extent of theoretical visibility is continuous across the study area.

It should be noted that the wind turbines, when viewed from distances of around, or greater than 10km, will generally be less distinct from other distant elements within the same field of view, and that most land within the viewshed comprises rural agricultural/pastoral areas with scattered timber growth.

Figure 14
Zone of visual influence (blade tip)

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), VIRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F14_Zone_of_visual_influence_221031_v04

Section 7. Visual influence zones

7.1 Introduction

Three zones of visual influence (low, moderate and high) have been established for the Project area from dwellings and key public viewpoints. This has established the relative landscape significance against which the potential impacts of wind turbines may be assessed. **Table 7-1** relies on the data gathered for the baseline study and consideration of the following key factors as detailed in the Bulletin:

- Viewer sensitivity levels
- Visibility distance zones; and
- Scenic quality class.

Each visual influence zone has a corresponding set of visual performance objectives including different visual objectives and levels of landscape protection for the assessment and determination of the Project. The consideration of the performance objectives is included in **Section 8** of this LVIA.

Figure 15
Visual influence zone matrix

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**

Viewer sensitivity level – Distance zone	Scenic quality class		
	High	Moderate	Low
Level 1 Viewpoints			
Near Foreground 0 – 500 m	VIZ1	VIZ1	VIZ1
Mid Foreground 500 m – 1 km	VIZ1	VIZ1	VIZ1
Far Foreground 1 – 2 km	VIZ1	VIZ1	VIZ1
Near Middleground 2 – 4 km	VIZ1	VIZ2	VIZ2
Far Middleground 4 – 8 km	VIZ2	VIZ2	VIZ2
Near Background 8 – 12 km	VIZ2	VIZ2	VIZ2
Mid Background 12 – 20 km	VIZ2	VIZ2	VIZ3
Far Background 20 – 32+ km	VIZ2	VIZ2	VIZ3
Level 2 Viewpoints			
Near Foreground 0 – 500 m	VIZ1	VIZ1	VIZ1
Mid Foreground 500 m – 1 km	VIZ1	VIZ1	VIZ1
Far Foreground 1 – 2 km	VIZ1	VIZ1	VIZ2
Near Middleground 2 – 4 km	VIZ2	VIZ2	VIZ2
Far Middleground 4 – 8 km	VIZ2	VIZ2	VIZ3
Near Background 8 – 12 km	VIZ2	VIZ3	VIZ3
Mid Background 12 – 20 km	VIZ2	VIZ3	VIZ3
Far Background 20 – 32+km	VIZ3	VIZ3	VIZ3
Level 3 Viewpoints			
Near Foreground 0 – 500 m	VIZ1	VIZ1	VIZ2
Mid Foreground 500 m – 1 km	VIZ2	VIZ2	VIZ2
Far Foreground 1 – 2 km	VIZ2	VIZ2	VIZ3
Near Middleground 2 – 4 km	VIZ2	VIZ3	VIZ3
Far Middleground 4 – 8 km	VIZ2	VIZ3	VIZ3
Near Background 8 – 12 km	VIZ3	VIZ3	VIZ3
Mid Background 12 – 20 km	VIZ3	VIZ3	VIZ3
Far Background 20 – 32+ km	VIZ3	VIZ3	VIZ3
Areas Not Visible	VIZ3	VIZ3	VIZ3

Note:

- Column 1 codes represent a combination of the viewer sensitivity level (1-high, 2-moderate, 3-low) and the distance zones
- Columns 2 – 4 indicate visual influence zones varying by row according to the combination of viewer sensitivity level-distance zone and scenic quality class.

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Source: Wind Energy - Visual Assessment Bulletin, NSW Government (2016), Cambium Group (2022).

Table 7-1 - Visual influence zone analysis

Representative view location (and other proximate dwellings) and sensitivity level	Distance from representative dwelling to closest wind turbine and wind turbine id (visible or not visible)	Scenic quality class	Visual influence zone
R04 Level 2	3.64km Turbine W-152	LCU6 - Moderate	VIZ2
R05 Level 2	4km Turbine W-001	LCU6 - Moderate	VIZ2
R09 Level 2	4.6km Turbine W-204	LCU6 - Moderate	VIZ2
R12 Level 2	5.6km Turbine W-152	LCU6 - Moderate	VIZ2
R13 Level 2	5.7km Turbine W-176	LCU6 - Moderate	VIZ2
R14 Level 2	6.1km Turbine W-176	LCU3 - Moderate	VIZ2
R16 Level 2	6.5km Turbine W-177	LCU3 - Moderate	VIZ2
R17 Level 2	6.6km Turbine W-177	LCU3 - Moderate	VIZ2
R18 Level 2	7.2km Turbine W-176	LCU3 - Moderate	VIZ2
R21 Level 2	8km Turbine W-173	LCU6 - Moderate	VIZ3
R22 Level 2	8.1km Turbine W-202	LCU3 - Moderate	VIZ3
R23 Level 2	8.2km Turbine W-046	LCU6 - Moderate	VIZ3
R24 Level 2	8.4km Turbine W-202	LCU3 - Moderate	VIZ3
R25 Level 2	8.5km Turbine W-202	LCU3 - Moderate	VIZ3
R26 Level 2	8.9km Turbine W-200	LCU6 - Moderate	VIZ3
R27 Level 2	8.9km Turbine W-185	LCU3 - Moderate	VIZ3
R28 Level 2	9.2km Turbine W-202	LCU3 - Moderate	VIZ3
R29 Level 2	9.3km Turbine W-205	LCU3 - Moderate	VIZ3
R30 Level 2	9.4km Turbine W-176	LCU6 - Moderate	VIZ3
R31 Level 2	9.4km Turbine W-003	LCU6 - Moderate	VIZ3
R32 Level 2	9.6km Turbine W-202	LCU3 - Moderate	VIZ3
R33 Level 2	9.9km Turbine W-003	LCU6 - Moderate	VIZ3
R34 Level 2	9.9km Turbine W-202	LCU3 - Moderate	VIZ3

Section 8. Visual performance evaluation

8.1 Introduction

The Bulletin requires an evaluation of the Project and its various components, turbines and ancillary facilities against the visual performance objectives, using a combination of desktop and field evaluations.

The Bulletin notes that *'visual performance objectives are used as a framework for evaluation that enables potential impacts and management options to be considered objectively, against the varying levels of landscape significance established by the baseline study. Application of the visual performance objectives allows for a transparent and robust assessment process, which still provides flexibility for proponents and consent authorities'.*

Visual performance objectives included in the Bulletin relate to:

- Visual Magnitude
- Landscape Scenic Integrity
- Key Features Disruption
- Multiple Wind Turbine Effects
- Shadow Flicker and Blade Glint
- Aviation Hazard Lighting

The performance objectives as set out in the Bulletin are described below:

8.2 Visual magnitude

Visual magnitude is noted as a key visual parameter. The black threshold line on the graph below (from the Bulletin Figure 5) indicates where turbines may potentially have significant visual magnitude impacts based on their relative height and their distance from viewpoints.

For this visual assessment, an additional threshold blue line has been added to the visual magnitude graph which identifies potentially high visual magnitude impacts, to allow more detailed assessment as part of this LVIA.

The Bulletin notes that *'the assessment of potential impacts relating to visual magnitude is a key factor as it is acknowledged that wind turbines are very large structures that will be visible in the landscape'.*

Figure 16
Visual magnitude thresholds

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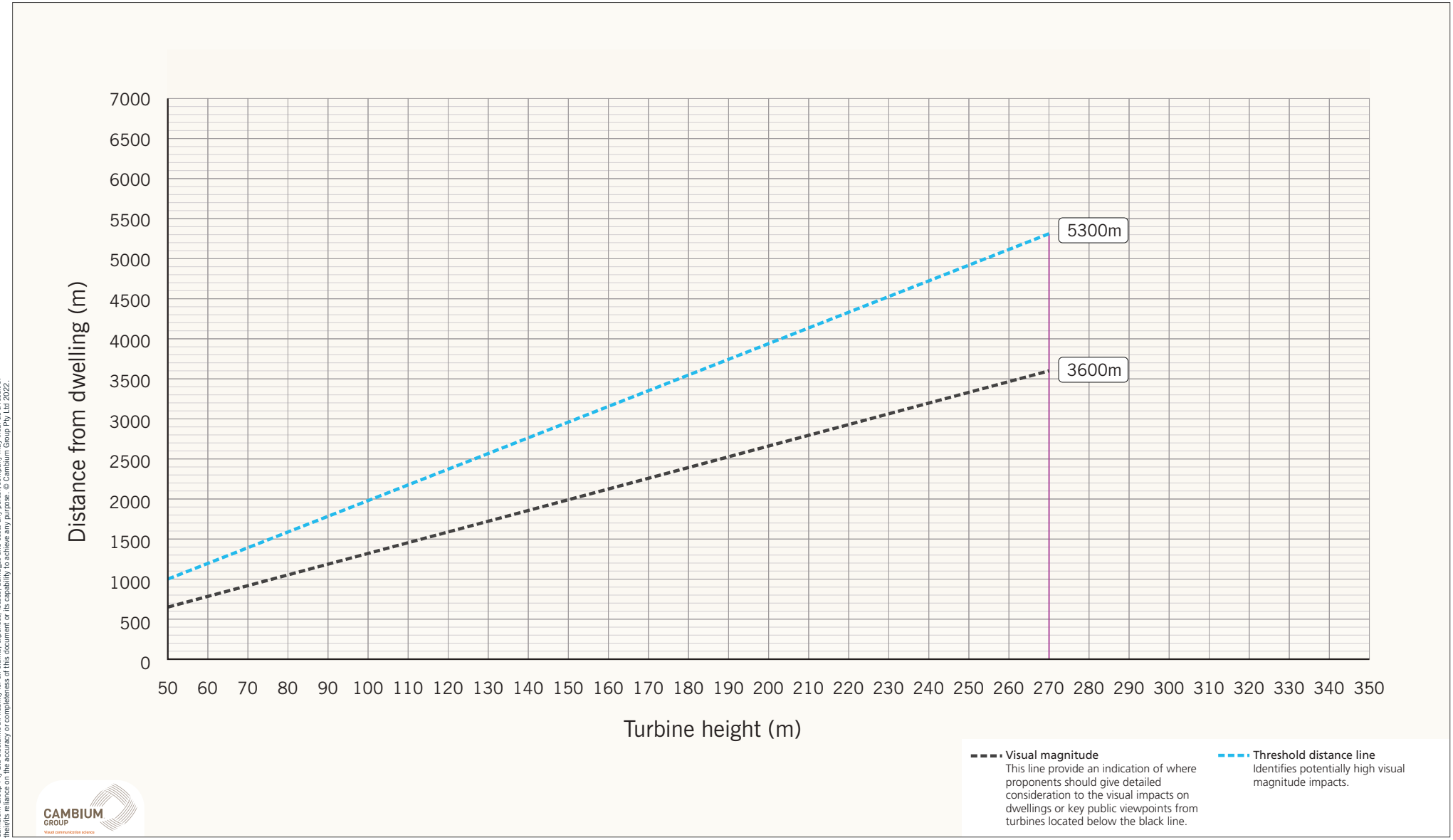

CAMBIUM GROUP
Visual communication science

Source: Wind Energy - Visual Assessment Bulletin, NSW Government (2016), Cambium Group (2022).

8.3 Landscape scenic integrity

The Bulletin notes that *'the landscape scenic integrity criterion assesses the extent to which the current landscape character and scenic quality of the visual catchment would be maintained given a proposed landscape alteration, such as a wind energy project'.*

8.4 Key features disruption

The Bulletin notes that *'the key features disruption parameter describes proposed wind turbines that are likely to disrupt or interrupt the central line of sight and/or the central focal viewing field surrounding it, when seen from a viewpoint looking toward the identified key features of a landscape. Identification of these key landscape features will also be informed by community consultation undertaken for the proposal, as discussed above. Examples include visually prominent mountain peaks, large rock outcrops, waterfalls, rivers or creeks, distinctive stands of vegetation and distinctive cultural buildings'.*

8.5 Multiple wind turbine effects

The Bulletin notes that *'multiple wind turbine effect is the other key visual parameter utilised in the preliminary assessment tool. For the visual assessment, the effects of multiple wind turbines visible from individual viewpoints as part of the proposed wind energy project, as well as the cumulative landscape and visual impacts must be considered having regard to existing and approved wind energy projects located within eight kilometres of the proposed wind energy project. Depending on the viewer sensitivity level, the location of the proposed turbines should avoid, where possible, views to turbines of one or more wind energy projects, within the effective horizontal views of two or more 60° sectors (from Level 1 viewpoints), or in three or more 60° sectors (from Level 2 viewpoints)'.*

Multiple Wind Turbine Tool (MWTT) diagrams have been generated through GIS analysis and presented in the performance objective assessment for each non-associated dwelling within 8km of wind turbine locations as well as key public view locations beyond the Project area. Each MWTT diagram includes a separate visibility rose to illustrate the number of 60° sectors occupied by wind turbines.

8.6 Shadow flicker and blade glint

The Bulletin notes that *'shadow flicker caused by certain sun angles in relation to the rotation of wind turbine blades on dwellings will be limited to 30 hours per year, and may require mitigation measures such as amended siting and design of turbines to minimise the amount of shadow flicker. Similarly, the direct reflection of the sun from the wind turbine structure (glint) is to be minimised through appropriate turbine treatments (such as the use of low sheen and matte finishes)'.*

A shadow flicker assessment has not been prepared as dwellings are located beyond a distance where shadow flicker is likely to be noticeable.

8.7 Aviation hazard lighting

The Bulletin notes that *'wind turbines located in the vicinity of an aerodrome are subject to standards imposed by the National Airports Safeguarding Framework 10. CASA must be notified by the proponent if a proposed wind turbine or wind monitoring tower is greater than 150 metres in height or infringes on the Obstacle Limitation Surface (OLS) of an aerodrome. CASA may determine, and subsequently advise a proponent and relevant planning authorities, whether night-lighting is required'.*

If such lighting is required, the CASA guidelines recommend that to minimise visual impacts *"obstacle lights may be partially shielded, provided it does not compromise their operational effectiveness. Where obstacle lighting is provided, lights should operate at night, and at times of reduced visibility. All obstacle lights on a wind farm should be turned on simultaneously and off simultaneously."*

Aviation hazard lighting has been assessed in the Aeronautical Impact Assessment Report (Landrum & Brown Worldwide Australia Pty Ltd, July 2022) which concluded that *'wind turbines over 150m should reasonably be considered as potential hazards to aviation'…*and that*…'lighting should be considered as part of the proponents duty of care'.*

8.8 Visual performance evaluation overview

The Bulletin notes that *'Visual assessment requires an evaluation of the proposed wind energy project and its various components, turbines and ancillary facilities against the visual performance objective of the project, using a combination of desktop and field evaluations'.*

Visual performance objectives are used as a framework for evaluation that enables potential impacts and management options to be considered objectively, against the varying levels of landscape significance established by the baseline study. Application of the visual performance objectives will allow for a transparent and robust assessment process, which still provides flexibility for proponents and consent authorities.

The visual performance objectives are set out in **Tables 8-1** to **8-7** for all non-associated dwellings out to 8km from the wind turbine locations. Non-associated dwellings beyond 8km from the wind turbines are considered in **Section 8.8** and key public view locations beyond 8km from the wind turbine locations included in **Table 8-8**. Dwelling and key public view locations are shown in **Figure 17**. Dwellings are presented in numerical order in the following tables.

Figure 17
Dwelling locations, key public locations and entitlements

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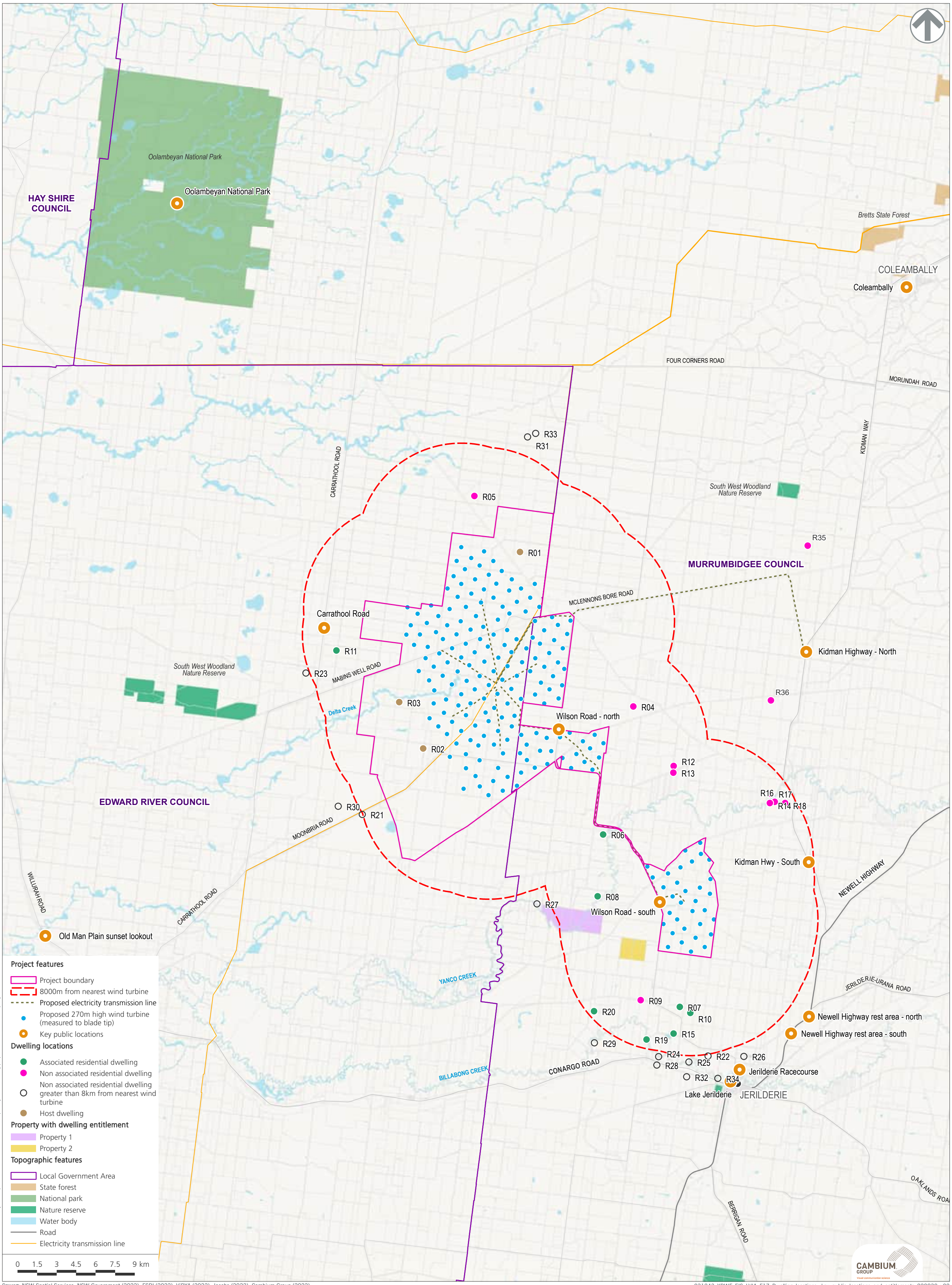
Landscape architecture



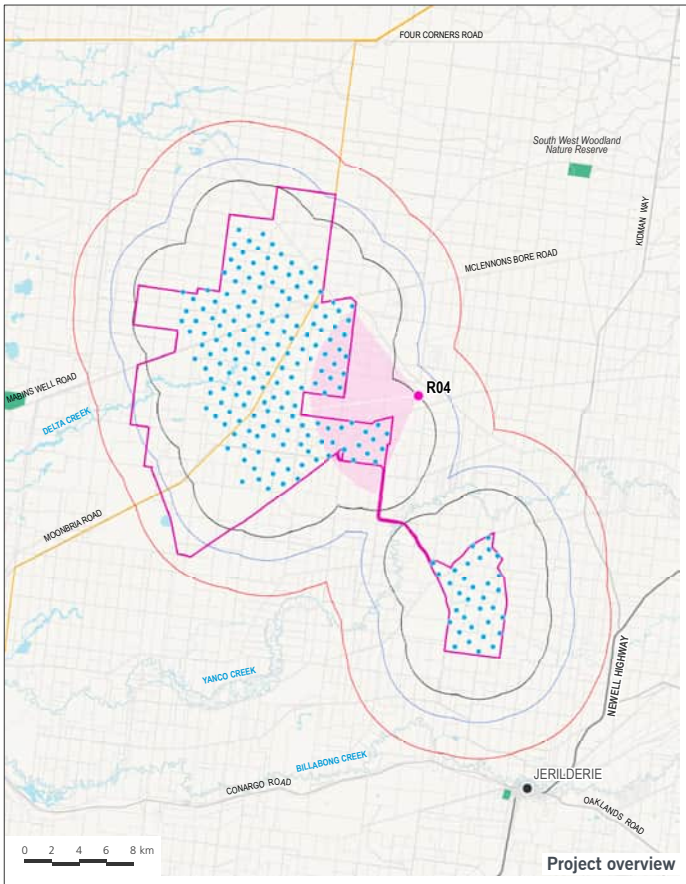
Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F17_Dwelling_locations_key_public_locations_and_entitlements_220930_v02

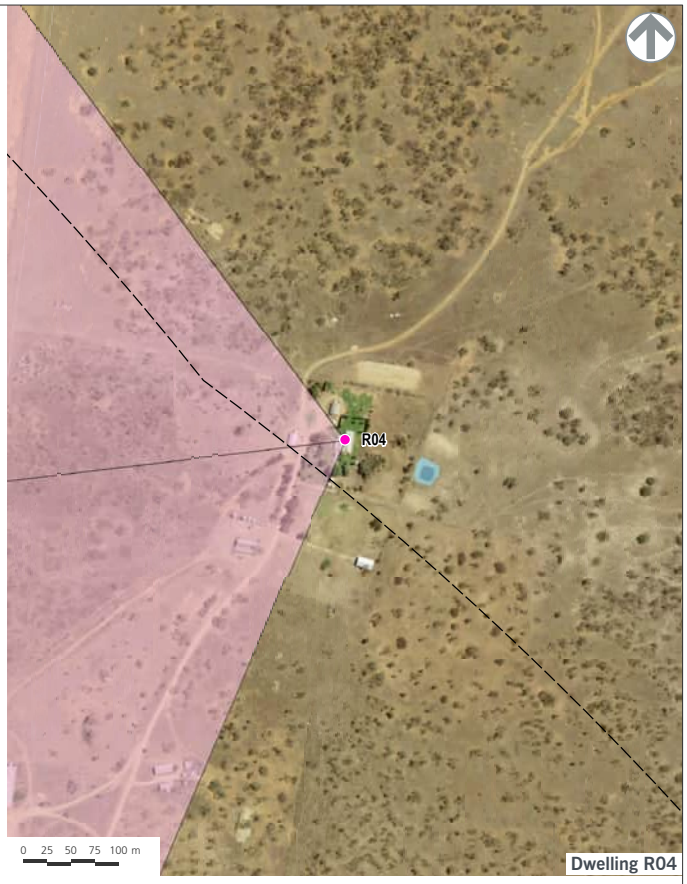
Figure 18
Dwelling R04 assessment

GBD Landscape architecture

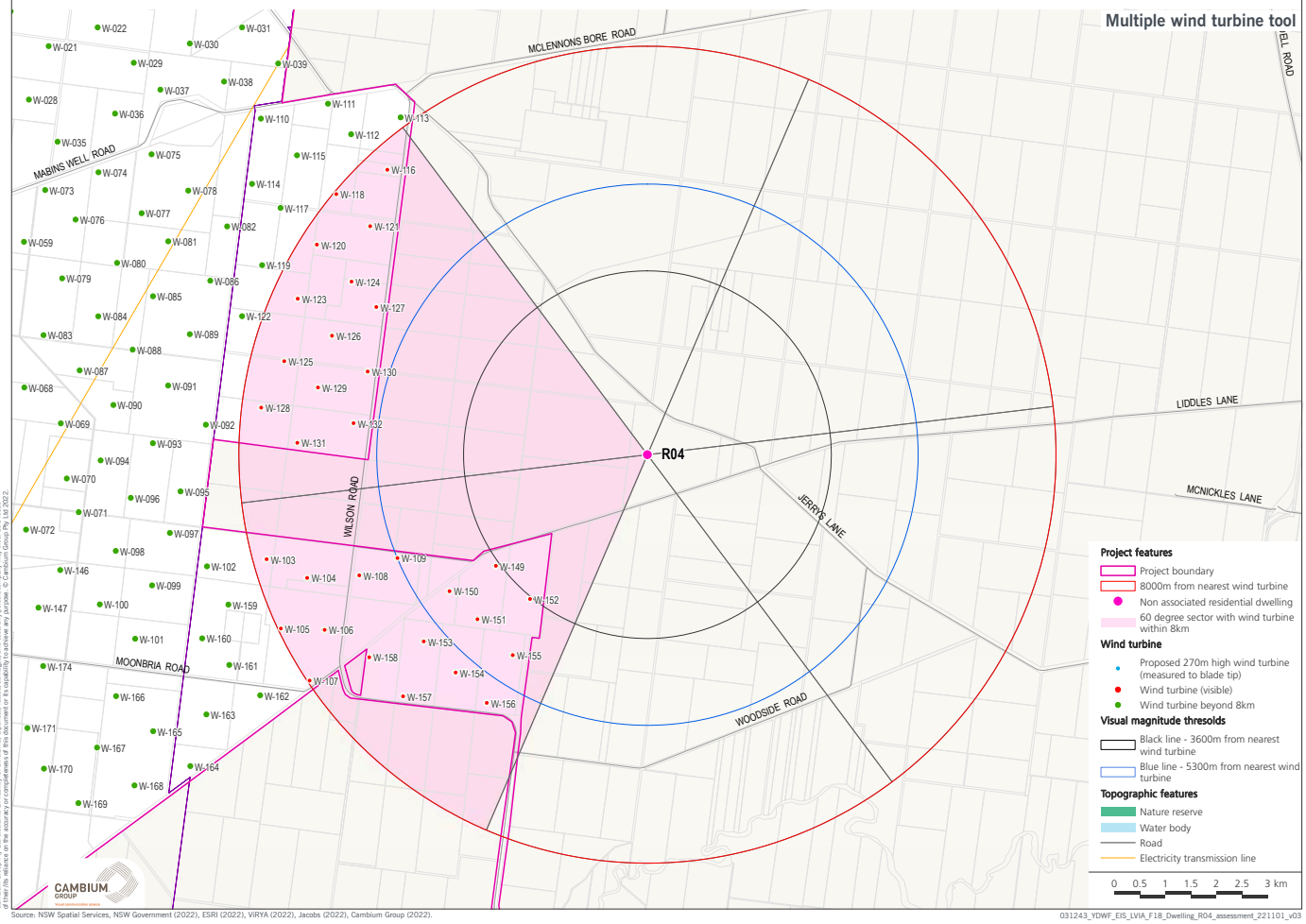
YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Project overview



Dwelling R04



Multiple wind turbine tool

Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F18_Dwelling_R04_assessment_221101_v03

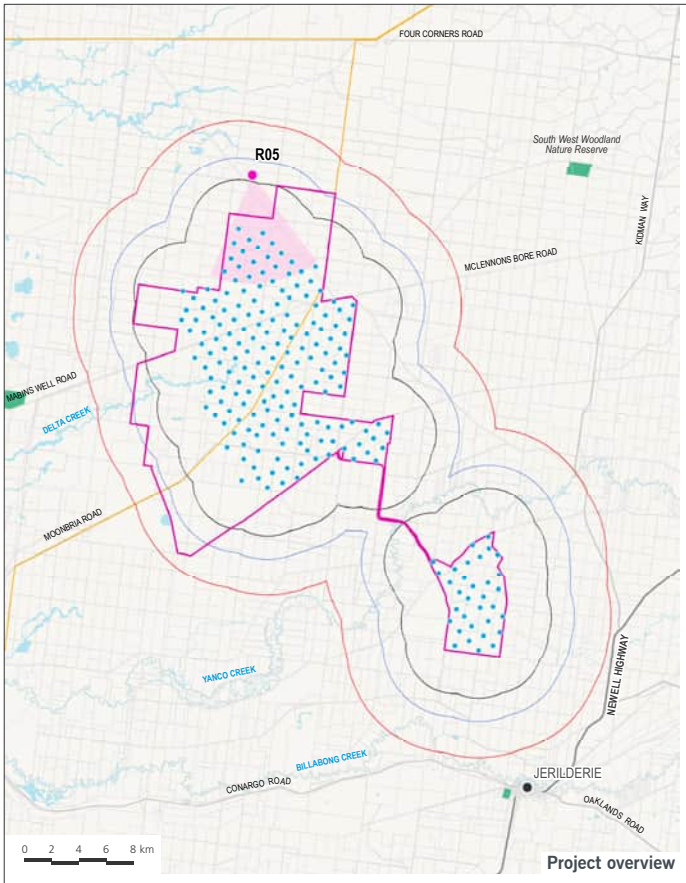
Table 8-1 - Viewpoint R04, Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-152) is located 3.6km (Near Middleground) from dwelling R04. • The MWTT diagram illustrates that no wind turbines would be visible below the black line and that 6 wind turbines would be visible (discounting vegetative screening) between the black and blue line with additional wind turbines extending up to 8km beyond the blue line south west to north west of the dwelling. • Lightly scattered tree cover around and beyond the dwelling may offer some filtering of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Near Middleground; therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: • Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: • Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 2 60-degree sectors and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including BESS, substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwelling.
Mitigation and management options		Screening (between the blue line and the black line) will be offered to the landowner in accordance with the Bulletin.

Figure 19
Dwelling R05 assessment

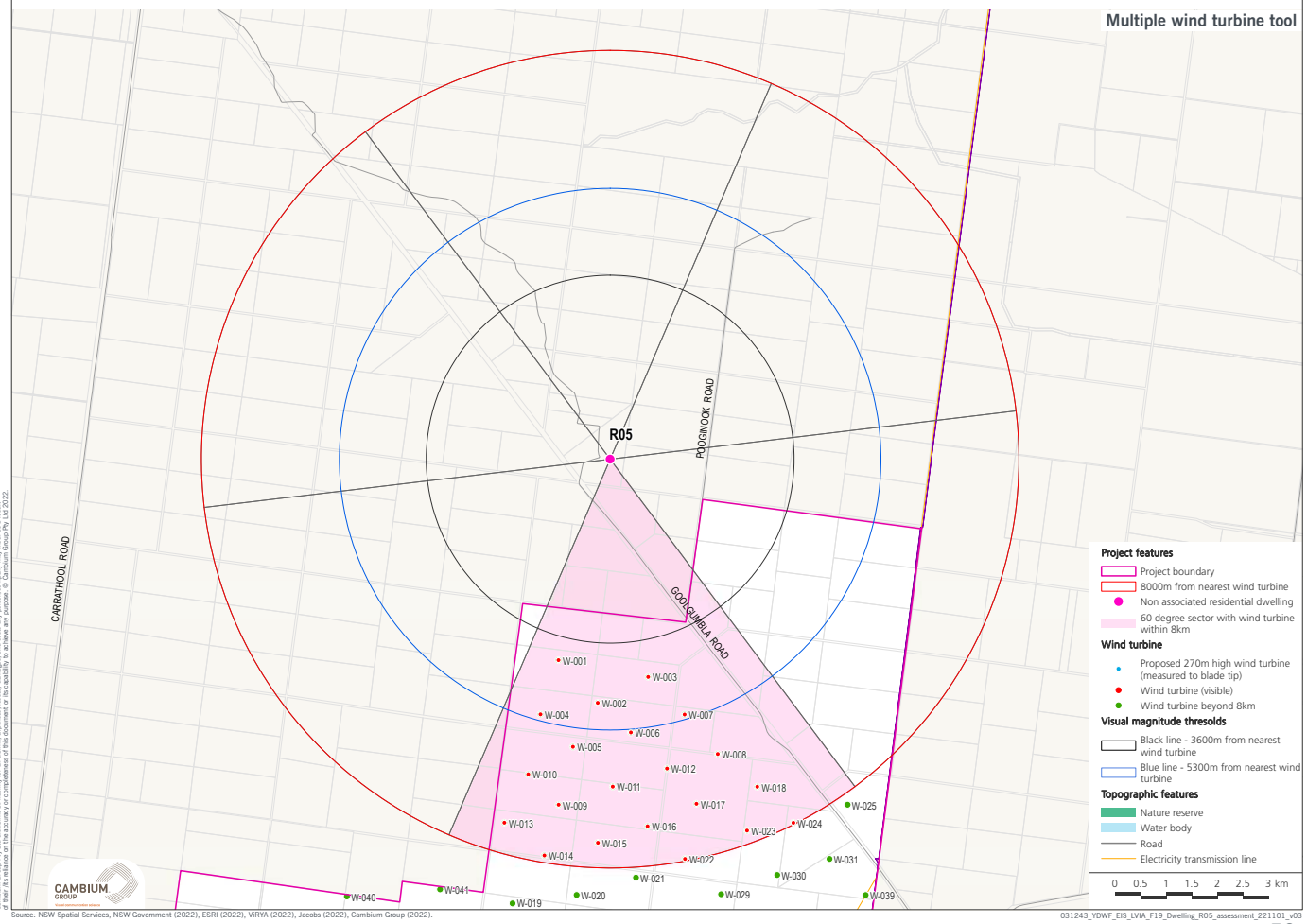
GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Project overview

Dwelling R05



Multiple wind turbine tool

Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F19_Dwelling_R05_assessment_221101_v03

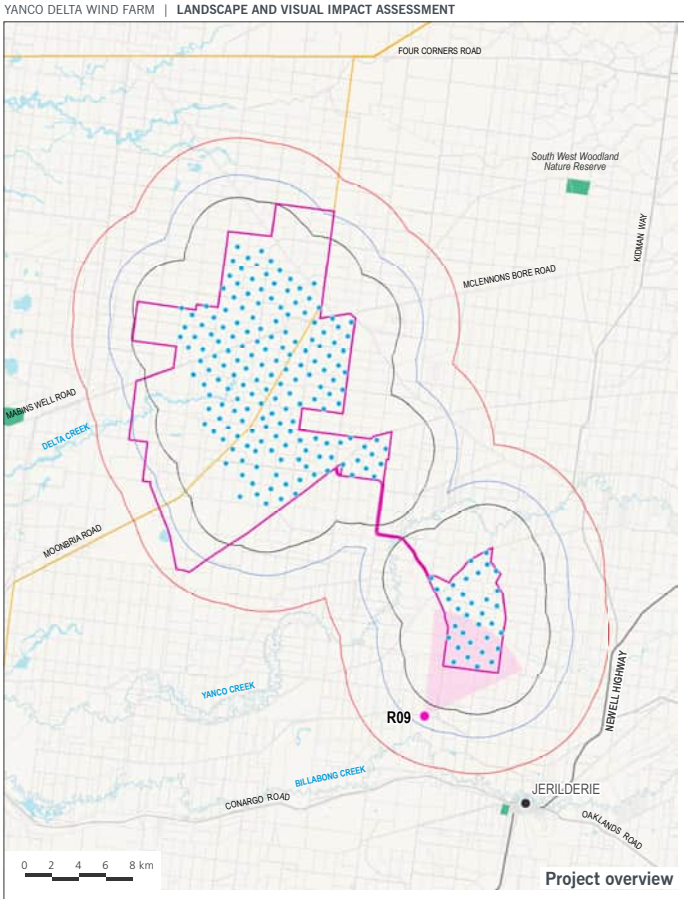
Table 8-2 - Viewpoint R05, Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-001) is located 4km (Far Middleground) from dwelling R05. • The MWTT diagram illustrates that no wind turbines would be visible below the black line and that 5 wind turbines would be visible (discounting vegetative screening) between the black and blue line with additional wind turbines extending up to 8km beyond the blue line south of the dwelling. • Tree cover around and beyond the dwelling will provide some filtering and screening of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Far Middleground, therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 1 60-degree sector and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including BESS, substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwelling.
Mitigation and management options		Screening (between the blue line and the black line) will be offered to the landowner in accordance with the Bulletin.

Figure 20
Dwelling R09 assessment

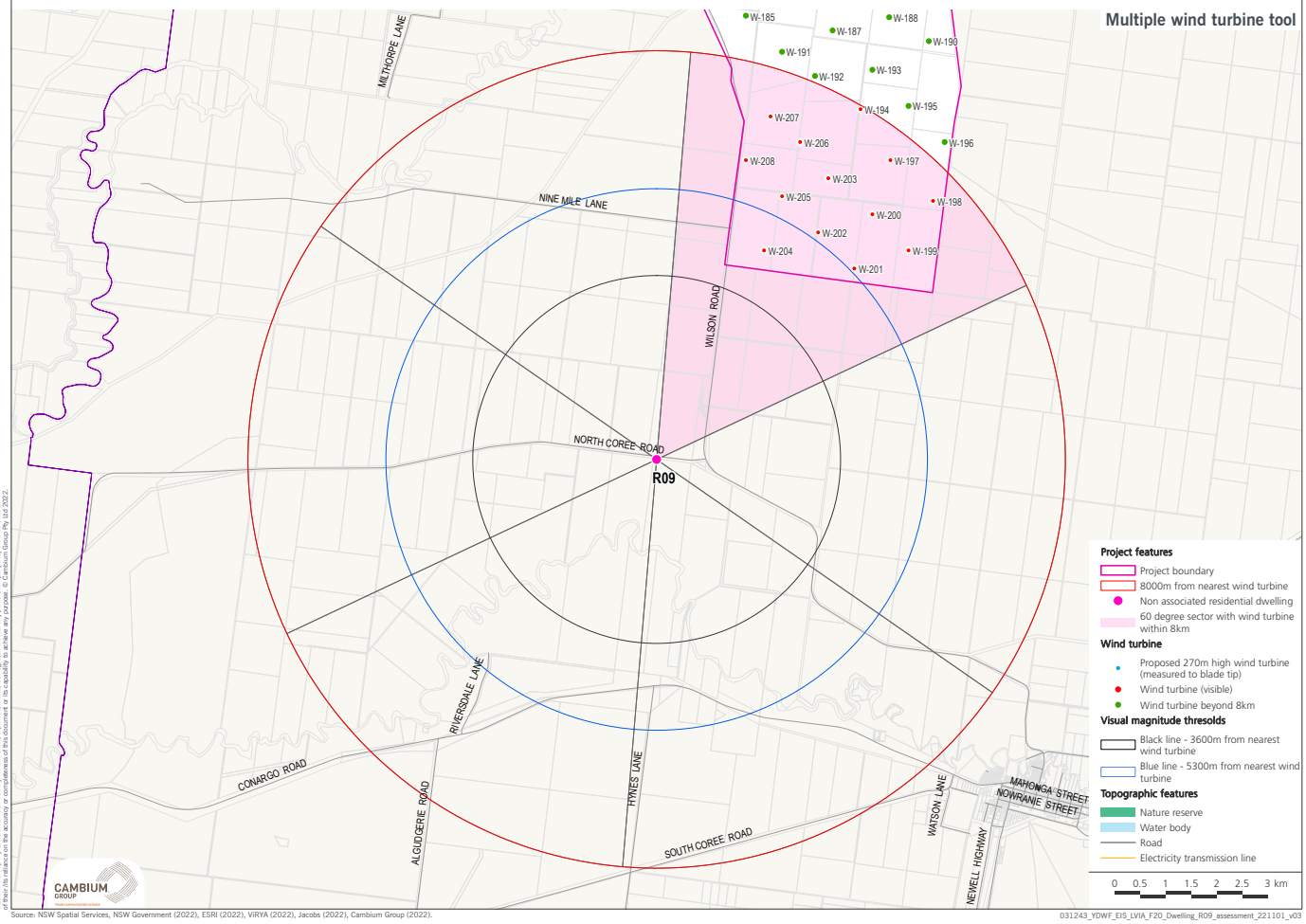
GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Project overview

Dwelling R09



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), VIRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F20_Dwelling_R09_assessment_221101_v03

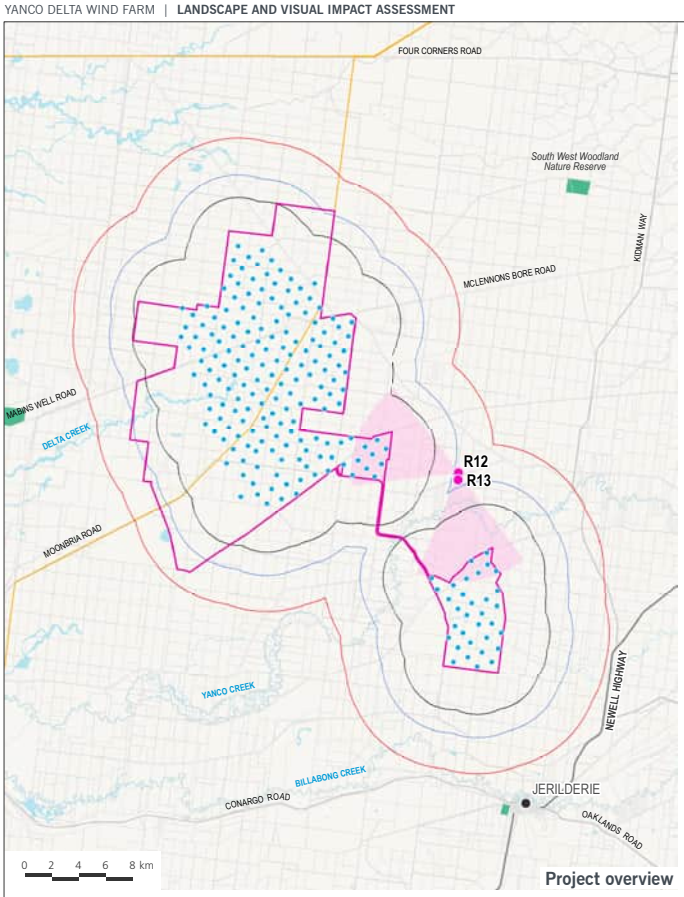
Table 8-3 - Viewpoint R09, Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-204) is located 4.6km (Far Middleground) from dwelling R09. • The MWTT diagram illustrates that no wind turbines would be visible below the black line and that 1 wind turbine would be visible (discounting vegetative screening) between the black and blue line with additional wind turbines extending up to 8km beyond the blue line north east of the dwelling. • Scattered tree cover around and beyond the dwelling offers some filtering and screening of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Far Middleground, therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 1 60-degree sector and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including BESS, substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwelling.
Mitigation and management options		Screening (between the blue line and the black line) will be offered to the landowner in accordance with the Bulletin.

Figure 21
Dwelling R12 assessment (also representing R13)

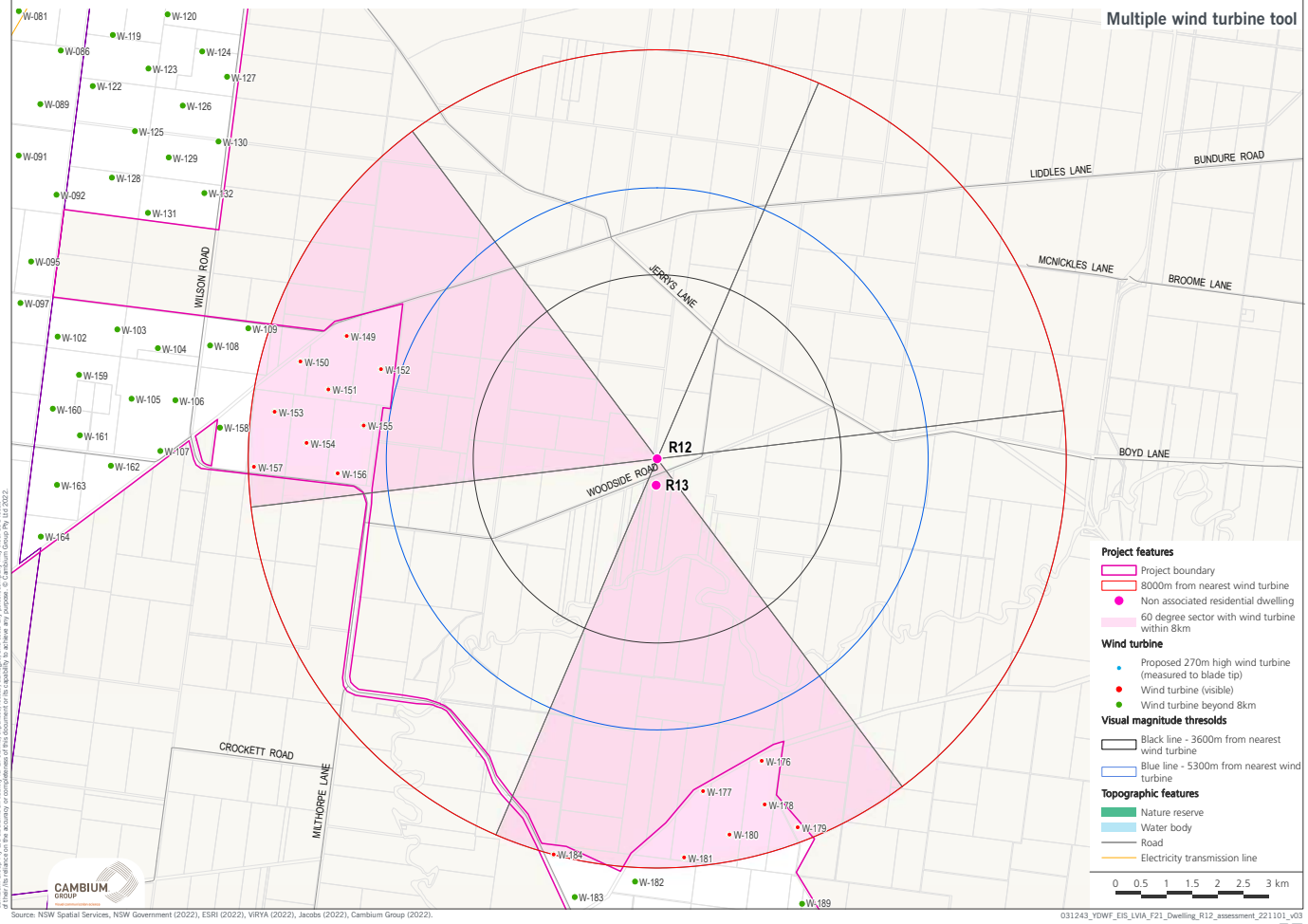
GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Project overview

Dwelling R12



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), VIRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F21_Dwelling_R12_assessment_221101_v03

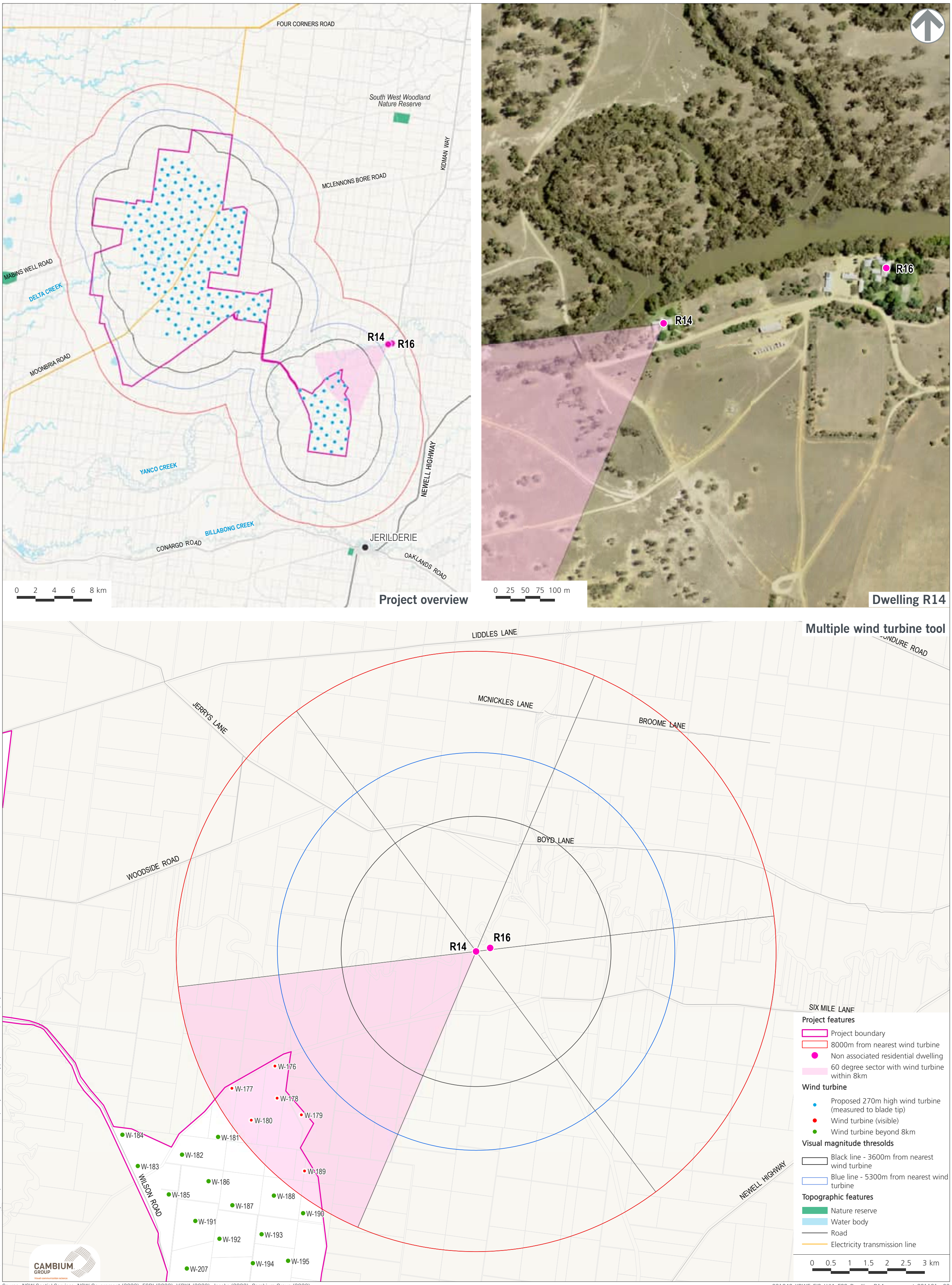
Table 8-4 - Viewpoint R12 (representing R13), Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-152) is located 5.6km (distance descriptor) from dwelling R12. • The MWTT diagram illustrates that no wind turbines would be visible below the black line or between the black and blue line for both dwellings. Wind turbines extend up to 8km beyond the blue line west and south of the dwellings. • Scattered tree cover around and beyond the dwelling may offer some filtering of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Near Middleground, therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 2 60-degree sector and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including BESS, substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwellings.
Mitigation and management options		Screening will be offered to the landowner in accordance with the consent conditions.

Figure 22
Dwelling R14 assessment (also representing R16)

GBD
Landscape architecture

YANCO DELTA WIND FARM | LANDSCAPE AND VISUAL IMPACT ASSESSMENT



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F22_Dwelling_R14_assessment_221101_v03

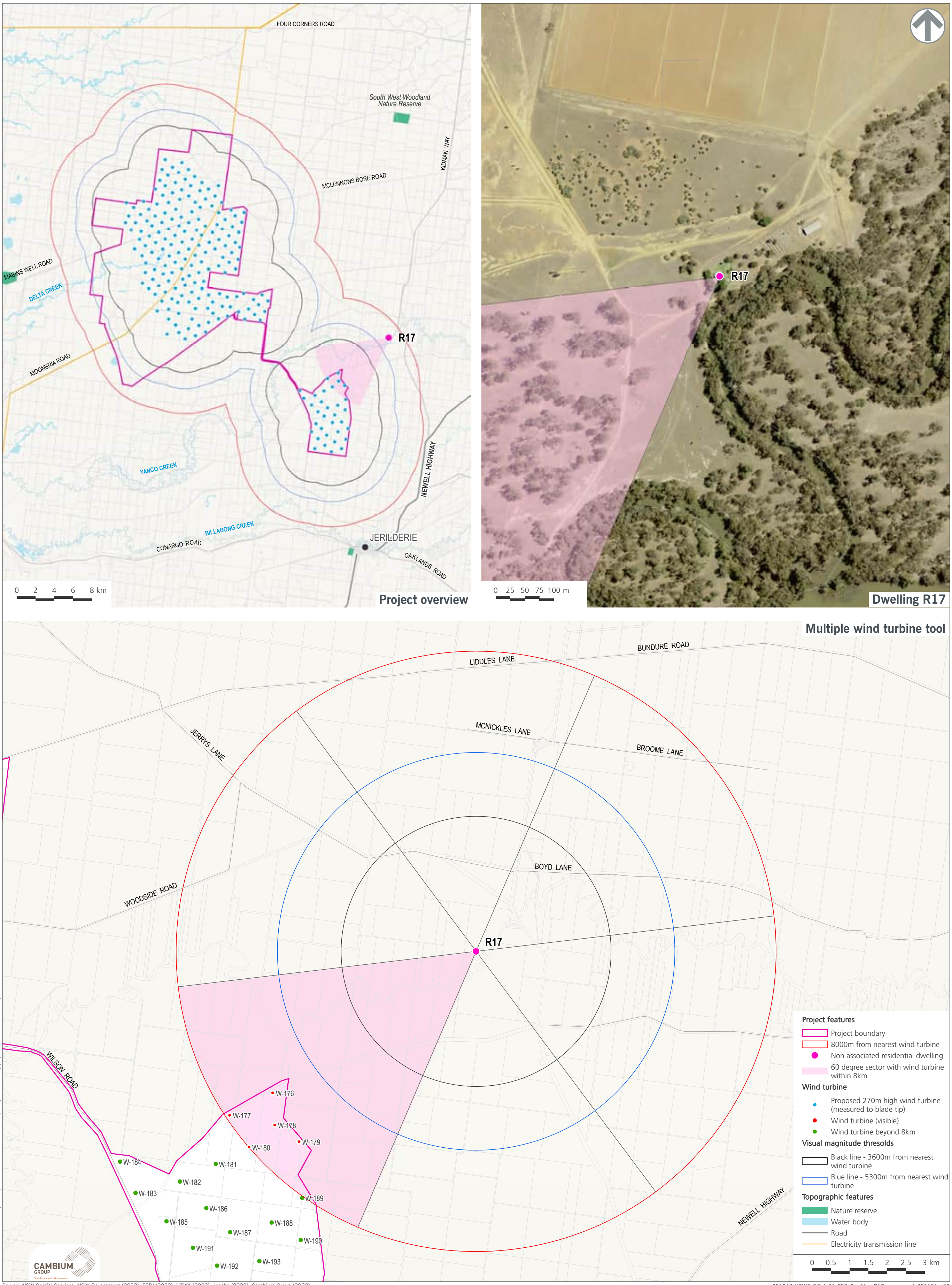
Table 8-5 - Viewpoint R14 (representing R16), Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-176) is located 6.1km (Far Middleground) from dwelling R14. • The MWTT diagram illustrates that no wind turbines would be visible below the black line or between the black and blue line for both dwellings. Wind turbines extend up to 8km beyond the blue line south west of the dwellings. • Lightly scattered tree cover around and beyond the dwellings may offer some filtering of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Near Middleground, therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 1 60-degree sector and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwellings.
Mitigation and management options		Screening will be offered to the landowner in accordance with the consent conditions.

Figure 23
Dwelling R17 assessment

GBD
Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), VIRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F23_Dwelling_R17_assessment_221101_v02

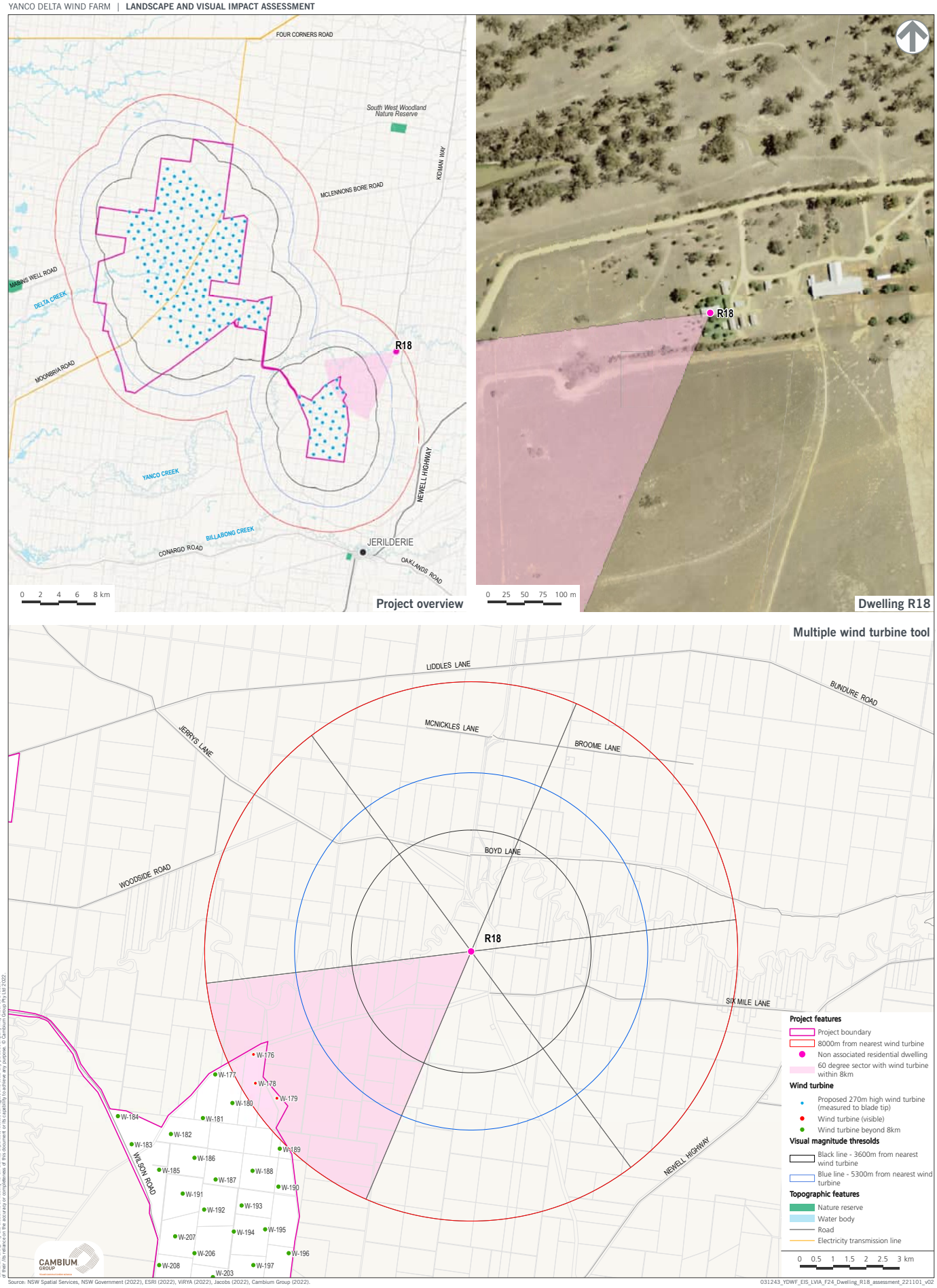
Table 8-6 - Viewpoint R17, Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-176) is located 6.6km (Far Middleground) from dwelling R17. • The MWTT diagram illustrates that no wind turbines would be visible below the black line or between the black and blue line for both dwellings. Wind turbines extend up to 8km beyond the blue line south west of the dwelling. • Tree cover around and beyond the dwelling may offer some filtering of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Near Middleground, therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 1 60-degree sector and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwelling.
Mitigation and management options		Screening will be offered to the landowner in accordance with the consent conditions.

Figure 24
Dwelling R18 assessment

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_F24_Dwelling_R18_assessment_221101_v02

Table 8-7 - Viewpoint R18, Rural dwelling VIZ2

Visual performance objectives	Visual influence zone 2	Evaluation
Visual magnitude	Objective: • Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. • Consider screening between the blue line and the black line.	• Closest wind turbine (W-176) is located 7.2km (Far Middleground) from dwelling R18. • The MWTT diagram illustrates that no wind turbines would be visible below the black line or between the black and blue line for the dwelling. Three wind turbines extend up to 8km beyond the blue line south west of the dwelling. • Lightly scattered tree cover around and beyond the dwelling may offer some filtering of views toward wind turbines from the dwelling and curtilage areas. • Whilst wind turbines may be visible the potential for visual impact is not significant and largely mitigated by distance. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. • Wind turbines are located beyond the black line at Near Middleground, therefore no mitigation measures are proposed below the black line.
Landscape scenic integrity	Objective: • Wind turbines should not cause significant modification of the visual catchment. • Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. • The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	• Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view. • The wind turbines will not become a major element in the landscape from this view location.
Key feature disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple wind turbine effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location occupy 1 60-degree sector and is therefore compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including, the BESS substations, internal electrical reticulation and 330kV/500kV transmission line will not be visible from the dwelling.
Mitigation and management options		Screening will be offered to the landowner in accordance with the consent conditions.

8.9 Dwellings beyond 8km

This LVIA has identified 14 dwellings located beyond the 8km Multiple Wind Turbine Tool threshold and up to a distance around 10km from the wind turbines. In accordance with the Bulletin and Visual Influence Zone Matrix, each of the dwellings beyond 8km is a Visual Influence Zone 3 category.

Screening of wind turbines below the black line would not be required, as no turbines would be located below the black line from any dwelling beyond 8km of a wind turbine.

The LVIA notes that no visual Landscape Scenic Integrity or Key Feature Disruption performance objectives apply to view locations in a Visual Influence Zone 3 category. In addition, there are no performance objectives noted for Visual Influence Zone 3 view locations regarding Multiple Wind Turbine effects.

8.10 Dwelling entitlements

The Proponent has advised 2 properties with potential dwelling entitlements within 8km of the Yanco Delta wind turbines. The properties are located to the west of the southern cluster of wind turbines south of Yanco Creek and accessed from Nine Mile Lane. There are no existing dwellings located on either property. Depending on any future dwelling location, the Yanco Delta wind turbines would have the potential to occur below the black line if owners selected dwelling sites within 3.6km of a wind turbine. The properties with potential dwelling entitlements are identified as Property 1 and 2 on **Figure 17**.

Table 8-8 - Key view locations - Performance objectives summary

Location ID	VIZ	Theoretical number of visible turbines below black line	Distance to nearest turbine	Performance objective met Yes (Y) or No (N)				Performance objective notes	Visual significance
				Ma	L	F	Mu		
Kidman Way	3	0	7km	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 3 view location.	Views toward the wind farm would be occasionally screened by tree cover alongside and beyond the road corridor. Views from moving vehicles would be temporary and short term in nature. Visual significance would be low.
Carrathool Road	3	0	6.16km	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 3 view location.	Views toward the wind farm would be occasionally screened by tree cover alongside and beyond the road corridor. Views from moving vehicles would be temporary and short term in nature. Visual significance would be low.
Local (unsealed) roads	1	0	Less than 500m	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 1 view location.	Views from a small number of roads would be direct and proximate to wind turbines. Views would be direct, but short term and transitory and largely impact associated landowners accessing agricultural and land or travelling between properties. Visual mitigation along local road corridors such as tree planting is not considered practical. Visual significance would be moderate to high.
Jerilderie Racecourse (to grandstand)	3	0	10km	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 3 view location.	Views from Lake Jerilderie Racecourse would be largely screened by tree cover surrounding the racetrack. Visual significance would be low.
Lake Jerilderie (and parks)	3	0	9.9km	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 3 view location.	Views from Lake Jerilderie and surrounding parkland/recreation areas would be largely screened by tree cover alongside the Billabong Creek corridor. Visual significance would be low.
Jerilderie township	3	0	10.3km	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 3 view location.	Views from the Jerilderie township would be largely screened by tree cover alongside the Billabong Creek corridor. Visual significance would be low.
Coleambally township	3	0	35km	Y	n/a	n/a	n/a	The wind farm is compliant with the Bulletin performance objectives as applicable to a VIZ 3 view location.	Long distance views toward the wind farm would be screened by vegetation and tree cover beyond the township. Visual significance would be negligible.

Ma – Magnitude, L – Landscape scenic integrity, F – Key feature disruption, Mu – Multiple wind turbine analysis

Section 9. Aviation hazard lighting

9.1 Aviation hazard lighting visual performance objectives

The Performance Objectives (applicable to all visual influence zones) states that:

- Aviation hazard lighting (AHL) must meet the requirements of the Australian Standard AS 4282 – 1997 and any prescribed or notified requirement.
- Shield all AHL within 2km from any dwellings and
- Avoid strobe lighting.

The Bulletin notes that *'the CASA guidelines recommend that to minimise visual impacts "obstacle lights may be partially shielded, provided it does not compromise their operational effectiveness. Where obstacle lighting is provided, lights should operate at night, and at times of reduced visibility. All obstacle lights on a wind farm should be turned on simultaneously and off simultaneously." The lights should be fully shielded from the view of any dwelling within' (sic).*

GBD notes the Australian Standard AS 4282 – 1997 states that the Standard does not apply to lighting systems which are of a cyclic or flashing nature (AS 4282 – 1997 Section 1 Scope and General, 1.1 Scope (e).

GBD also notes that the Australian Standard AS4282 – 1997 has been revised and is now designated as AS/NZS 4282:2019. Having reviewed AS4282:2019 GBD notes that the revised Standard does not apply to the performance objectives which states *'Lighting for aviation safety does not fall within the scope of this Standard'* (AS4282:2019 page 5).

A lighting plan has not been developed for the wind farm as there are no dwellings within 2km of a wind turbine. GBD understand that strobe lighting is not proposed to be installed on the wind turbines within the Project area.

9.2 Existing light sources

Limited existing night time light sources occur beyond the Project area viewshed. Distant residential and street lighting extends across the Jerilderie and Colleambally township urban and commercial areas. Localised lighting is associated with sparse rural dwellings located within 5.3km of the wind turbines, but lighting is unlikely to be visually prominent and does not emit any significant illumination beyond immediate areas surrounding residential and agricultural buildings. Occasional lights from vehicles travelling along the local roads and highways provide dynamic and temporary sources of light.

9.3 Potential light sources

The main potential light sources associated with the wind farm would include:

- Low intensity night lights for BESS, substations, construction compound and O&M facility; and
- Night time obstacle lights mounted on some wind turbines.

In accordance with the withdrawn CASA Advisory Circular two red medium intensity obstacle lights are required on specified turbines at a distance not exceeding 900 m and all lights were to flash synchronously. To minimise visual impact some shielding of the obstacle lights below the horizontal plane was permitted. Lighting for aviation safety could also be required prior to and during the construction period, including lighting for large equipment such as cranes.

In addition to the standard level of lighting required for normal security and safety, lighting could also be required for scheduled or emergency maintenance around the control building, substation and wind turbine areas.

As the visibility of the BESS, central primary and collector substations would be largely minimised and partially screened through existing vegetation, it is unlikely that light spill from these sources would be visible from distant dwellings.

9.4 Potential receiver locations and impact

The categories of potential receiver locations that could be impacted by night time lighting generally include residents and motorists.

Night time lighting associated with the wind farm is unlikely to have a significant visual impact on the majority of public receiver locations. Whilst obstacle lighting would be visible to motorists travelling along the local roads and portions of highways, the duration of visibility would tend to be very short and partially screened by vegetation along some sections of local road corridors and influenced by the direction of travel.

Night time obstacle lighting associated with the wind farm would be visible from a number of the residential receiver locations surrounding the wind farm; however, screening by vegetation and planting around dwellings would screen or partially obscure views toward night time obstacle lighting.

Irrespective of the total number of visible lights, obstacle lighting is more likely to be noticeable from exterior areas surrounding dwellings rather than from rooms within dwellings, where internal lighting tends to reflect and mirror views in windows, or where exterior views would be obscured when curtains and blinds are closed. Mitigation measures including screen planting would also provide screening and filtering of views toward night time obstacle lighting from dwellings.

9.5 Aviation hazard lighting

To assist in the mitigation of aviation hazards lighting the following should be considered:

- Aviation hazard lighting should be installed across the Project area in accordance with advice provided by an aviation consultant (L&B, 2022).
- Aviation hazard lighting is not required on every wind turbine. In accordance with CASA requirements, shielding may be provided to restrict downward light spill to the ground plane by ensuring that no more than 5% of the nominal light intensity be emitted at or below 5° below horizontal. No light should be emitted at or below 10° in the horizontal plane.
- Where two lights are mounted on a nacelle, dynamic shielding or light extinction for the period that a blade is passing in front of the light is permissible providing that at all times at least one light can be seen, without interruption, from every angle in azimuth.
- Surface treatment to the rear of wind turbine blades with a non-reflective coating may reduce reflection from wind turbine blades at night.
- CASA aviation hazard lighting requirements should be monitored by wind farm operators and shielding or lower intensity lighting should be implemented to reduce illumination as much as possible as approved by CASA.

9.6 Ancillary structures

To assist in the mitigation of night lighting associated with ancillary structures the following should be applied:

- Security lighting throughout the wind farm, collector substation and the central primary substation should be minimised to decrease the contrast between the wind farm and the surrounding night time environment.
- Motion detectors should be used to activate night time security lighting when required.
- Ancillary lighting is to be designed to ensure it does not spill onto nearby roads or dwellings.
- It is also noted that screen planting, where proposed as a visual mitigation measure, would also screen views toward wind turbines with obstacle lighting.

Section 10. Summary

The Yanco Delta Wind Farm LIVA has been prepared in accordance with the Project SEARs (SSD-41743746) and the Wind Energy – Visual Assessment Bulletin, December 2016 (the Bulletin) (DPE, 2016).

The Proponent has undertaken community consultation activities which identified key landscape features nominated by the community. This LVIA has considered the location of key landscape features within the consideration and application of the Key Features Disruption performance objective. The Project is not considered to result in an alteration or disruption of views toward significant landform, vegetation, or visually prominent cultural features.

A Visual Baseline Assessment has been prepared and incorporated community input to establish residential and public viewpoints and inform the LVIA of key landscape features and relative scenic quality. The LVIA has identified and described the relative scenic quality of the area within and surrounding the Project. The LVIA identified landscape surrounding the Project area within the NSW Riverina Bioregion (and Murrumbidgee sub region) with examples of high and moderate scenic quality. Most of the landscape within and surrounding the Project area is a moderate scenic quality landscape. The Yanco Delta Wind Farm will not result in a significant impact upon landscape scenic values or quality.

A range of Visual Influence Zones have been identified including VIZ 1 viewpoints associated with local roads within 500m of wind turbines. Most viewpoints assessed in the LVIA are VIZ 2 and VIZ 3 viewpoints and include rural dwellings beyond 2km from the wind turbines and public roads beyond 500m of wind turbine locations.

This LVIA has included a granular study incorporating all non-associated dwellings within 5.3km of the proposed wind turbine locations and a broader study incorporating dwellings, key public viewpoints, and scenic locations beyond or up to 10km from the proposed wind turbine locations. No wind turbines would be located below the black line for any non-associated dwellings surrounding the Project area.

Key public view locations, scenic areas or lookouts are located at distance from the wind turbines (and mostly beyond the 8km threshold). Whilst wind turbines will be visible from key public view locations, their overall scale will not dominate the landscape and would only occur within a single 60-degree sector where within 8km of the wind turbines.

The LVIA identified no existing operational or approved wind energy projects within a local context and/or within 8km of the proposed Yanco Delta Wind Farm wind turbines. GBD are cognisant of other proposed wind farm developments beyond the Yanco Delta Wind Farm Project area; however, information for other proposed wind farm developments is only available through publicly available project websites which do not identify proposed individual wind turbine locations. A MWTT analysis, incorporating wind turbines in other projects, cannot be prepared without other wind turbine location data being made available.

Electrical infrastructure associated with the project, including collector and central primary substations, overhead transmission line and BESS, would be located at distance from non-associated dwellings. These elements would either be screened from view or form generally indistinct objects in the landscape from key view locations. The 330/500kV transmission line would form a visible element from the McLennons Bore Road and at the short section spanning the Kidman Way connecting to TransGrid's Dinawan Terminal Station. Views from vehicles would be transitory and short term and would not result in significant visual effects. Proposed overhead transmission line routes from other wind farms are not publicly available and potential cumulative impacts cannot be determined.

The Yanco Delta Wind Farm is compliant with the Aviation hazard lighting performance objectives; however, AS 4282:1997 (and the updated AS4282:2019) as referenced in the Bulletin is not applicable to flashing aviation hazard lighting or lighting for aviation safety. Notwithstanding compliance with the Aviation hazard lighting performance objectives, the Proponent recognises sensitivities around night-time lighting and the existing dark sky environment. The Proponent has advised that potential impacts associated with night-time hazard lighting will be mitigated by installing a radar activated lighting system in accordance with any relevant DPE and CASA recommendations.

Section 11. Impact mitigation options

11.1 Introduction

A number of different impact mitigation options may be considered as potential methods of avoiding or minimising potential visual impacts. These include:

- Re-siting of turbines to locations where they will have less visual impact (or removal if necessary)
- Re-sizing of turbines and other alterations (to reduce their visual magnitude)
- Re-colouring (for example to reduce hue and tonal contrast); and
- Vegetation screening (for example to screen the alterations from view).

It is noted that mitigation measures may change or evolve over time. This section does not limit proponents from posing other mitigation measures, other than those listed, to be considered in the assessment process.

11.2 Wind farm design (re-siting / removing turbines)

The following visual requirements and constraints have been, and continue to be considered when determining wind turbine layouts and the potential re-siting and/or removal of wind turbines including, but not limited to:

- Topography and local wind conditions
- Locations of non-associated dwellings in the vicinity
- Results of noise monitoring and modelling
- Identified ecological features (e.g., vegetation)
- Identified heritage items
- Potential visual impacts on dwellings
- Locations of communications links in the vicinity
- Aviation assessments and landing grounds in the vicinity; and
- Accessibility for delivery of wind turbine components.

11.3 Re-sizing

The Bulletin notes that *'re-sizing of turbines and other associated wind energy development facilities (i.e., roads, buildings, electricity transmission terminals, and distribution electricity power lines and poles or underground cabling) can be considered in two ways:*

- *using wind turbines or other structures that are of a lesser height or size in order to reduce their relative visual magnitude within the distance that they are viewed from critical viewpoints and*
- *substituting larger wind turbines (that generate more electricity) or other structures for a significantly higher number of smaller wind turbines or other structures.*

The Proponent does not propose to re-size key infrastructure elements associated with the Project as these have been designed to address specific technical engineering requirements as well as site specific design and safety parameters.

GBD does not consider that replacing larger wind turbines with a *'significantly higher number of smaller wind turbines'* is a valid mitigation measure as it introduces the prospect of non-compliance with a number of performance objectives within the Bulletin including Key Features Disruption and Multiple Wind Turbine Effects. We also note general design considerations should avoid introducing wind turbines of varying heights or designs within a single project.

11.4 Re-colouring

The Bulletin notes that *'one of the key reasons that wind turbines and other alterations may be detected as alterations in the landscape is that they can be visually distinguished from their surrounding landscape due to their degree of colour contrast. If these alterations had no colour contrast at all with their surrounding landscape, they would be virtually undetectable'.*

The Bulletin also notes that *'white colours will always produce the most extreme colour contrast in every situation except when white clouds form the backdrop. Hence selecting turbine colours to achieve the greatest average contrast reduction under the various sky lighting conditions may provide a better solution when wind turbines are located on ridgetops'.*

Wind turbines are commonly installed in a white to off white colour across Australia as well as in most other countries around the world. This industry standardised colour has likely been adopted for a number of reasons. White is a neutral colour and whilst visible against blue sky backdrops it will tend to blend readily on cloudy or partly cloudy days. The white colour also assists with protecting wind turbine infrastructure by reflecting ultraviolet rays rather than absorbing them and helps to protect the generator from overheating. Wind turbines are also painted white to provide contrast between the wind turbine structures and the ground when viewed from aircraft flying above the wind farm.

The Bulletin references the National Airports Safeguarding Framework (NASF), Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers, Guideline D. Guideline D provides guidance on the risks to civil aviation arising from wind farms and wind monitoring equipment. It notes *'the implementation of the guidelines will have the additional benefit of being applicable in areas away from airports to address the risk posed by wind farms to air navigation in those areas'.*

Guideline D notes that *'During the day, large wind turbines are sufficiently conspicuous due to their shape and size, provided the colour of the turbine is of a contrasting colour to the background. Rotor blades, nacelle and upper 2/3 of the supporting mast of wind turbines should be painted white, unless otherwise indicated by an aeronautical study. Other colours are also acceptable unless the colour of the turbine is likely to blend in with the background.'*

The advice provided in the Bulletin to select *'turbine colours to achieve the greatest average contrast reduction'* appears to be at odds with the NASF Guideline D.

The following photographic **Plates 14** and **15** illustrate wind turbines with significant colouring differences and demonstrate the effect of cloud and partial cloud conditions on wind turbine colour. **Plate 16** illustrates wind turbines at the Windy Hill Wind Farm in Far North Queensland. The wind turbines have been painted with concentric bands of green paint, from dark green at the base to light green approximately one third of the tower height. The success of painting the wind turbine tower is dependent on the viewpoint location, elevation and backdrop.

Plate 14 – Wind turbines at Crookwell 2 Wind Farm NSW (Image: ©GBD Pty Ltd 2018)

Plate 15 – Wind turbines Boco Rock Wind Farm NSW (Image: ©GBD Pty Ltd 2017)

Plate 16 – Wind turbines with coloured base Windy Hill Wind Farm QLD (Image: ©GBD Pty Ltd 2017)

11.5 Visual mitigation through vegetative screening

Proposed vegetative screening at dwelling locations, to filter and screen views toward wind turbines is considered effective for wind turbines between the black and blue lines. Wind turbines will recede in scale and magnitude at relatively short distances within the landscape with little opportunity for variation in elevation across the largely flat plains landscape surrounding the Project area. The overall reduction of wind turbine scale with distance has been illustrated through photographs of the Murra Warra Wind Farm in Victorian Wimmera Plain region presented in **Figures 25 and 26**.

Screen planting has been demonstrated as an effective mitigation measure through preparation of typical cross sections and photomontages for all non-associated dwellings within 8km of wind turbines where views toward wind turbines have been identified.

Typical cross sections prepared for non-associated dwellings illustrate that planting around 3m in height, at a distance of 30m from dwellings, would screen views toward wind turbines. The height of effective screen planting will gradually reduce if planting can be installed closer to dwellings. In some locations effective screening height may be reduced to around 2m or below, where small trees may be replaced by medium to large shrubs closer to dwellings (between 10m to 15m).

Screen planting between the black and the blue line would also be considered effective given the reduced view angle toward wind turbines from distances beyond 3.6km of the wind turbines. Typical cross sections for non-associated dwellings are illustrated in **Figure 27**.

Tree and shrub planting mixes should be selected in agreement with landowners and a landscape rehabilitation specialist. A landscape rehabilitation specialist will provide advice on required tree heights, soil conditions and maintenance requirements. Planting strategies may consider mixing pioneer (faster growing) species with longer term trees to achieve earlier screening potential whilst other trees establish.

Planting mixes may include evergreen and deciduous trees as branch tracery (bare branches) will disrupt and partially screen views of wind turbines. Evergreen planting may not be suitable in every location beyond dwellings where winter shading may create issues.

Planting mixes should consider a range of plant container sizes between tube stock to semi mature 75L stock if considered appropriate.

Planting may commence prior to wind farm construction where photomontage and desk top GIS applications can provide a good indication of where views toward wind turbines may occur from dwellings. In most cases there would be no requirement to delay planting until the wind turbines have been constructed. If views toward wind turbines are identified post construction, then supplementary planting can be installed.

A plants rate of growth will be subject to several physical and environmental factors including, but not limited to plant species, soil conditions, watering, protection from livestock and maintenance.

The potential visual impact of the Project from specific view locations can be mitigated by planting vegetation as on-site or off-site work. On-site landscape works within and around smaller items of project infrastructure such as substations and operation/ maintenance buildings may assist in screening views.

The location and design of screen planting used as a mitigation measure is site specific and requires detailed analysis of potential views and consultation with surrounding landowners. It is noted that screen planting cannot provide effective mitigation in all circumstances but can reduce the extent of existing and desirable views available from dwellings or other key view locations.

11.6 Detailed design

Mitigation measures during the detailed design process should consider:

- Further refinement in the design and layout where possible, which may assist in the mitigation of bulk and height of proposed structures and
- A review of materials and colour finishes for selected components including the use of non-reflective finishes to structures where possible.

11.7 Construction

Mitigation measures during the construction period should consider actions to:

- Minimise tree removal where possible
- Avoid temporary light spill beyond the construction site where temporary lighting is required
- Progressively rehabilitate disturbed areas and
- Protect mature trees within the Project area where possible.

11.8 Operation

Mitigation measures during the operational period should consider:

- Ongoing maintenance and repair of constructed elements
- Replacement of damaged or missing constructed elements and
- Long term maintenance (and replacement as necessary) of vegetation within the Project area to maintain visual filtering and screening of external views where appropriate.

Figure 25

Murra Warra wind farm 2km and 3km wind turbine distance

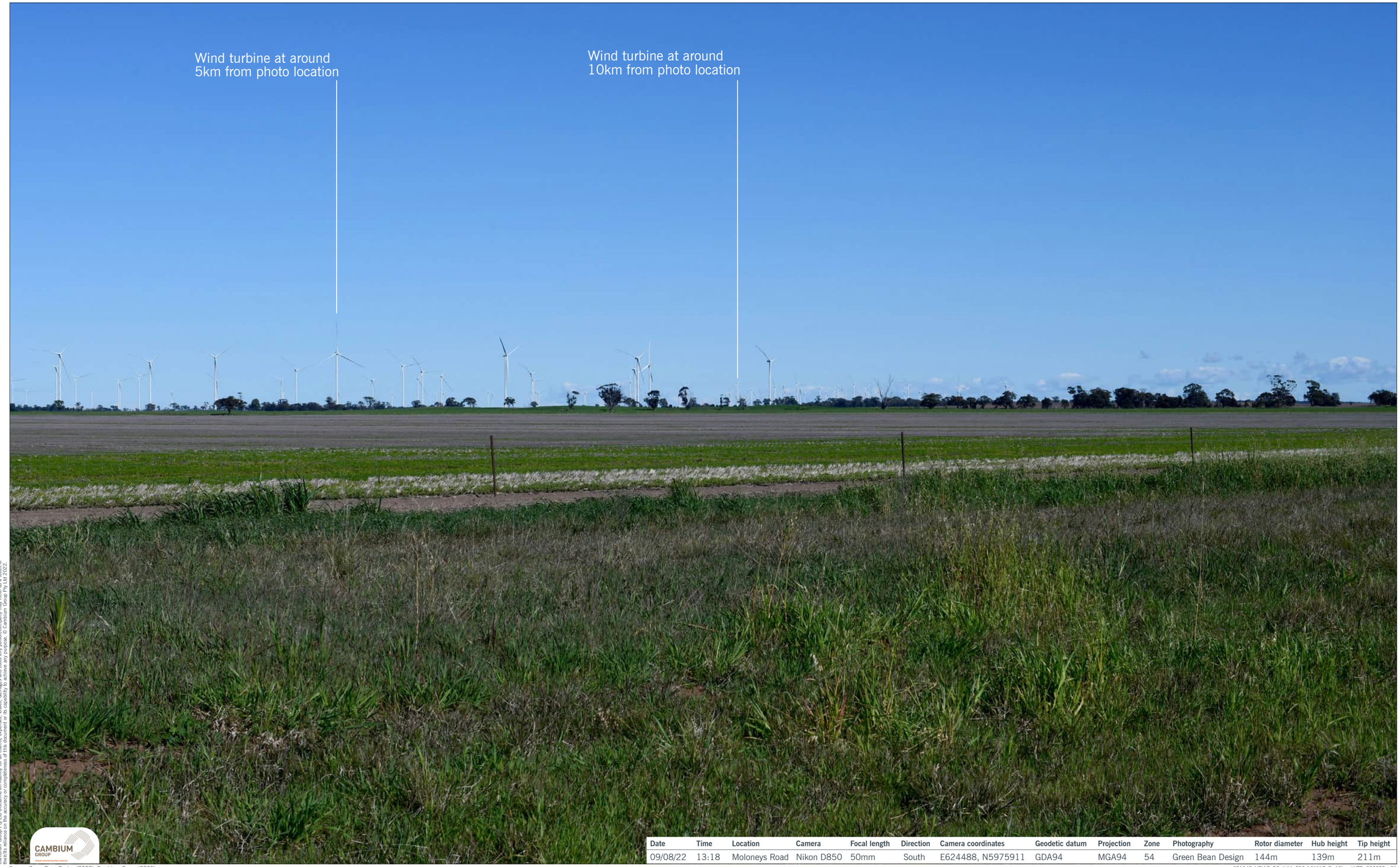
Date	Time	Location	Camera	Focal length	Direction	Camera coordinates	Geodetic datum	Projection	Zone	Photography	Rotor diameter	Hub height	Tip height
09/08/22	13:01	Barrat Road	Nikon D850	50mm	South	E620812, N5971950	GDA94	MGA94	54	Green Bean Design	144m	139m	211m

Source: Green Bean Design (2022), Cambium Group (2022).

Figure 26

Murra Warra wind farm 5km and 10km wind turbine distance

GBD Landscape architecture

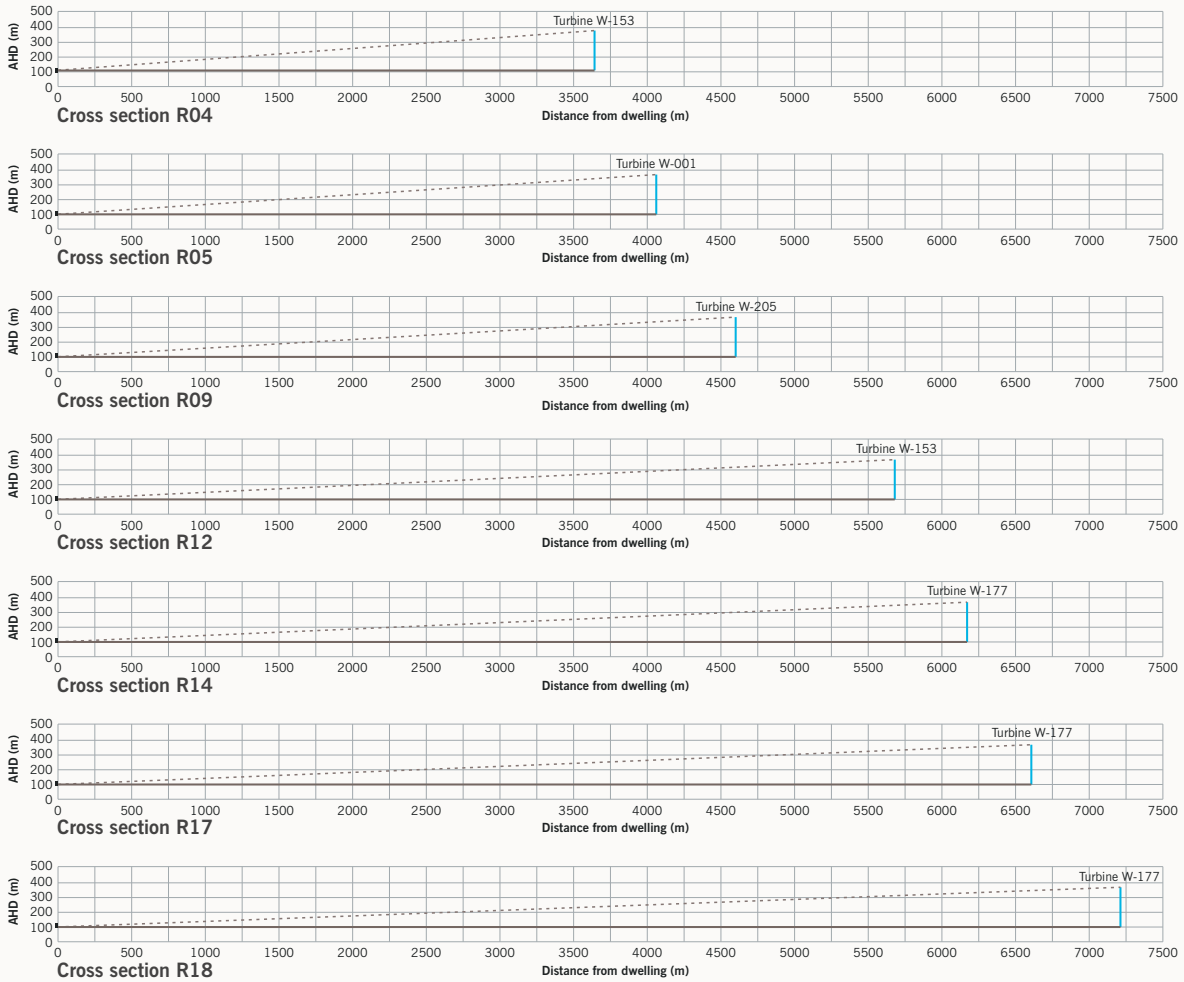


Date	Time	Location	Camera	Focal length	Direction	Camera coordinates	Geodetic datum	Projection	Zone	Photography	Rotor diameter	Hub height	Tip height
09/08/22	13:18	Moloneys Road	Nikon D850	50mm	South	E624488, N5975911	GDA94	MGA94	54	Green Bean Design	144m	139m	211m

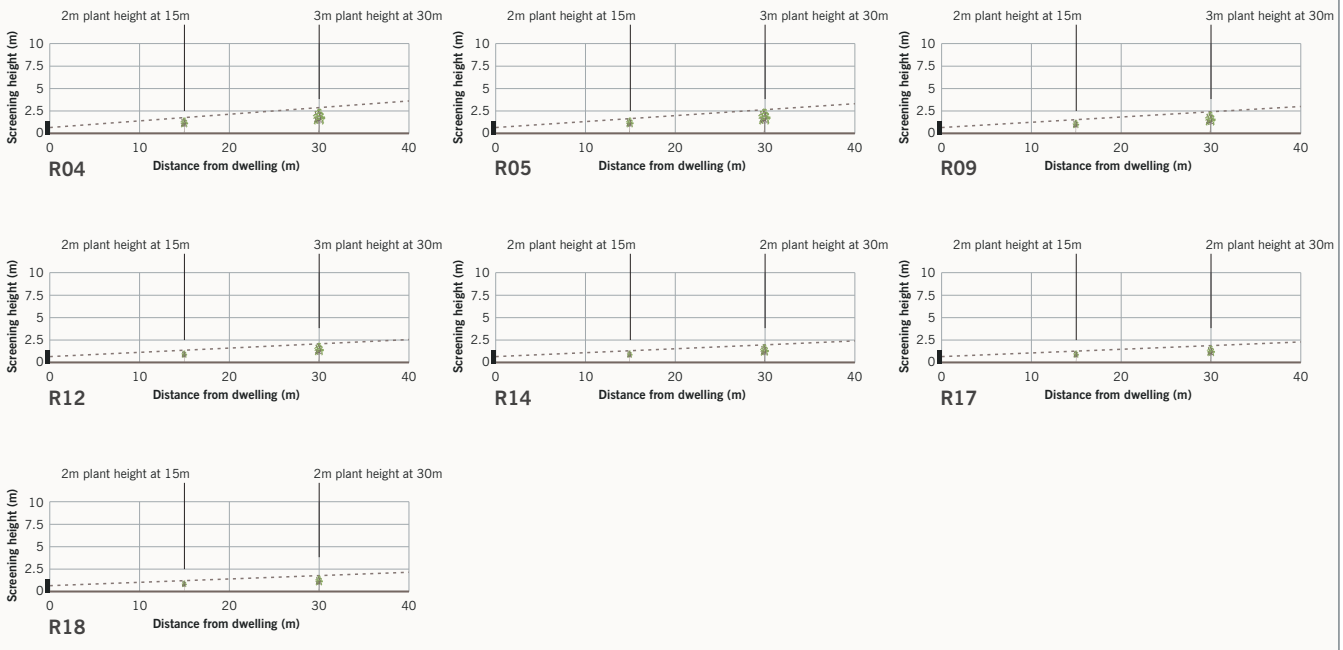
Source: Green Bean Design (2022), Cambium Group (2022).

Figure 27
Screen planting mitigation - typical cross sections

GBD Landscape architecture



Required height to screen/filter views towards wind turbines



Source: Green Bean Design (2022), Cambium Group (2022).

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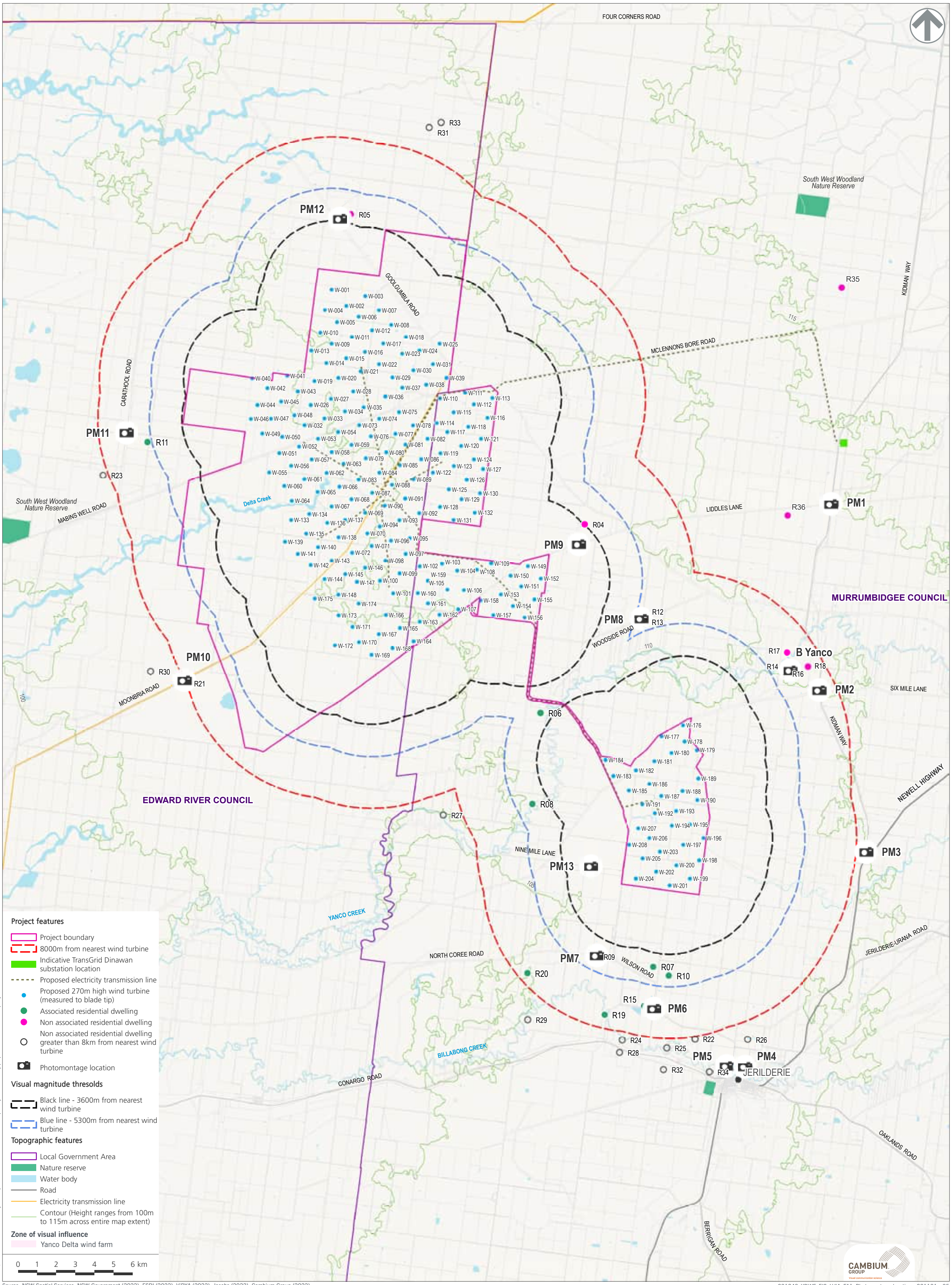
Appendix A
Photomontages

Figure A1
Photomontage locations

GBD
Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Source: NSW Spatial Services, NSW Government (2022), ESRI (2022), ViRYA (2022), Jacobs (2022), Cambium Group (2022).

031243_YDWF_EIS_LVIA_FA1_Photomontage_locations_221101_v05

Figure A2a

PM1 photomontage - Kidman Way at Liddles Lane

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	10:48	PM1 Kidman Way at Liddles Lane	Nikon D850	50mm	180°	116.65mAHD	E389410m, N6116769m	GDA94	MGA94	55	13.9km (W-176)	Green Bean Design

CAMBIUM GROUP

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A2b

PM1 detail view - Kidman Way at Liddles Lane

GBD Landscape architecture

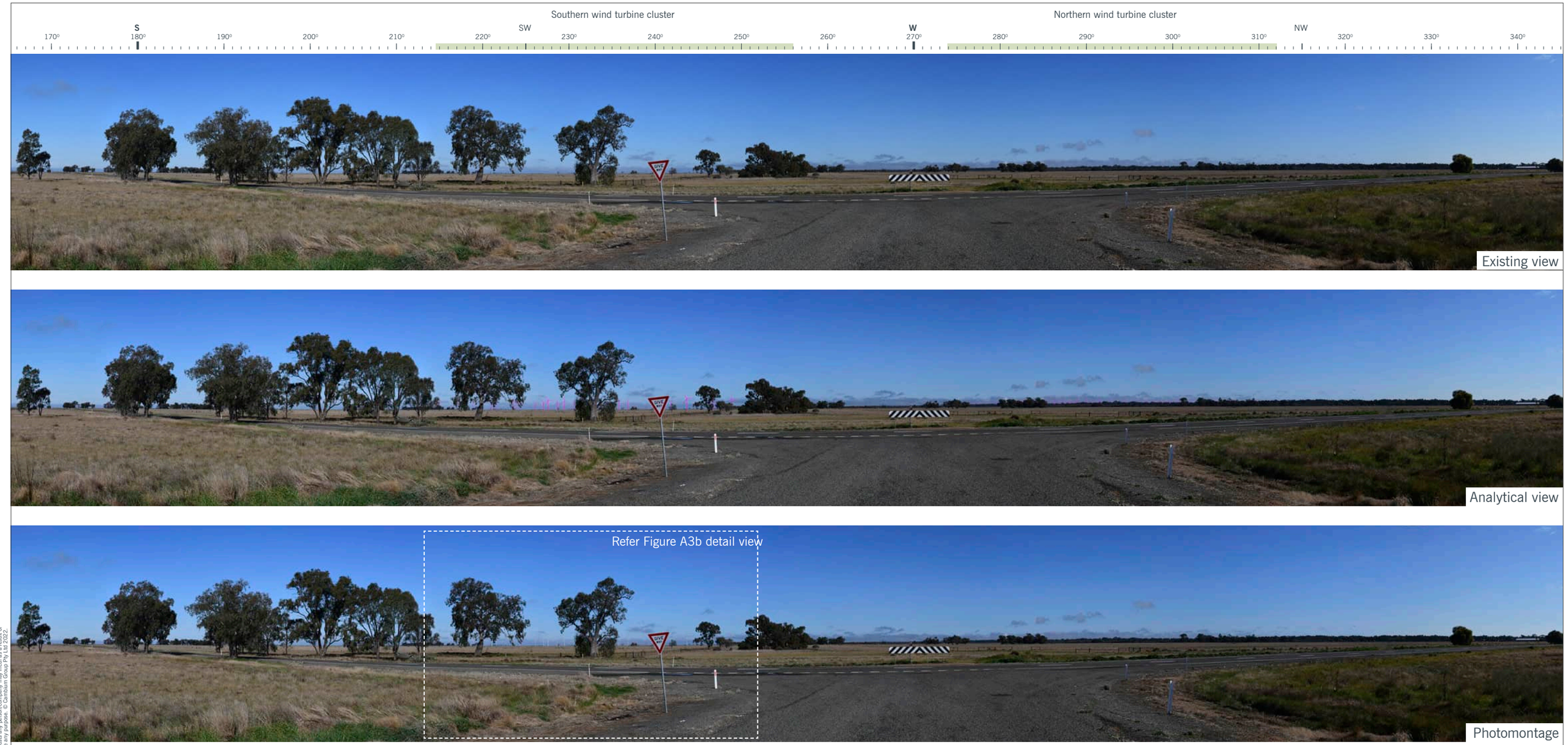
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	10:48	PM1 Kidman Way at Liddles Lane	Nikon D850	50mm	40°	116.65mAHD	E389410m, N6116769m	GDA94	MGA94	55	13.9km (W-176)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A3a

PM2 photomontage - Kidman Way at Six Mile Lane

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	11:32	PM2 Kidman Way at Six Mile Lane	Nikon D850	50mm	180º	111.65mAHD	E388784m, N6107043m	GDA94	MGA94	55	7.1km (W-179)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A3b

PM2 detail view - Kidman Way at Six Mile Lane

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	11:32	PM2 Kidman Way at Six Mile Lane	Nikon D850	50mm	40^0	111.65mAHD	E388784m, N6107043m	GDA94	MGA94	55	7.1km (W-179)	Green Bean Design

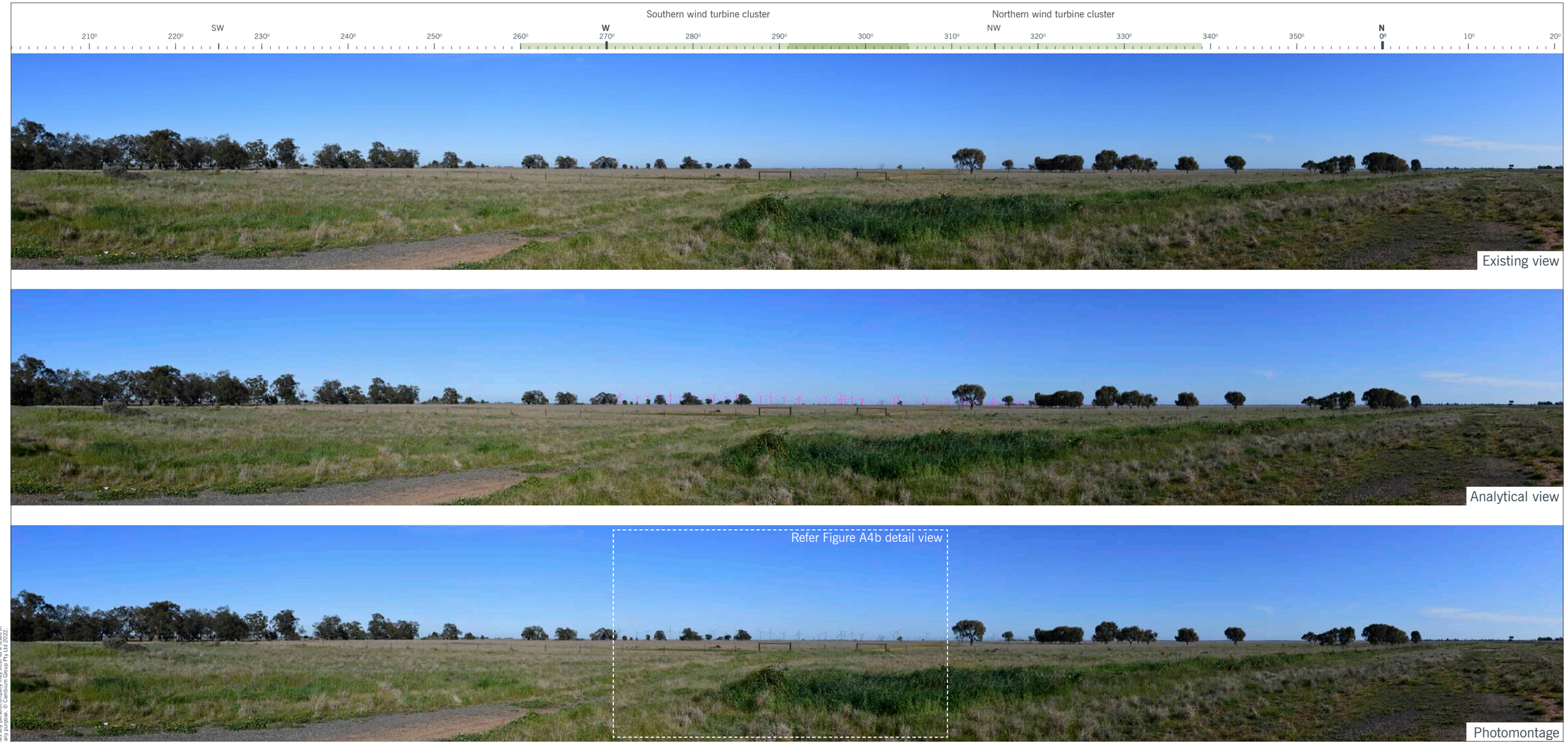
Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A4a

PM3 photomontage - Kidman Way at Newell Highway

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	09:19	PM3 Kidman Way at Newell Highway	Nikon D850	50mm	180°	111.65mAHD	E391235m, N6098589m	GDA94	MGA94	55	8.5km (W-179)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A4b

PM3 detail view - Kidman Way at Newell Highway

GBD Landscape architecture

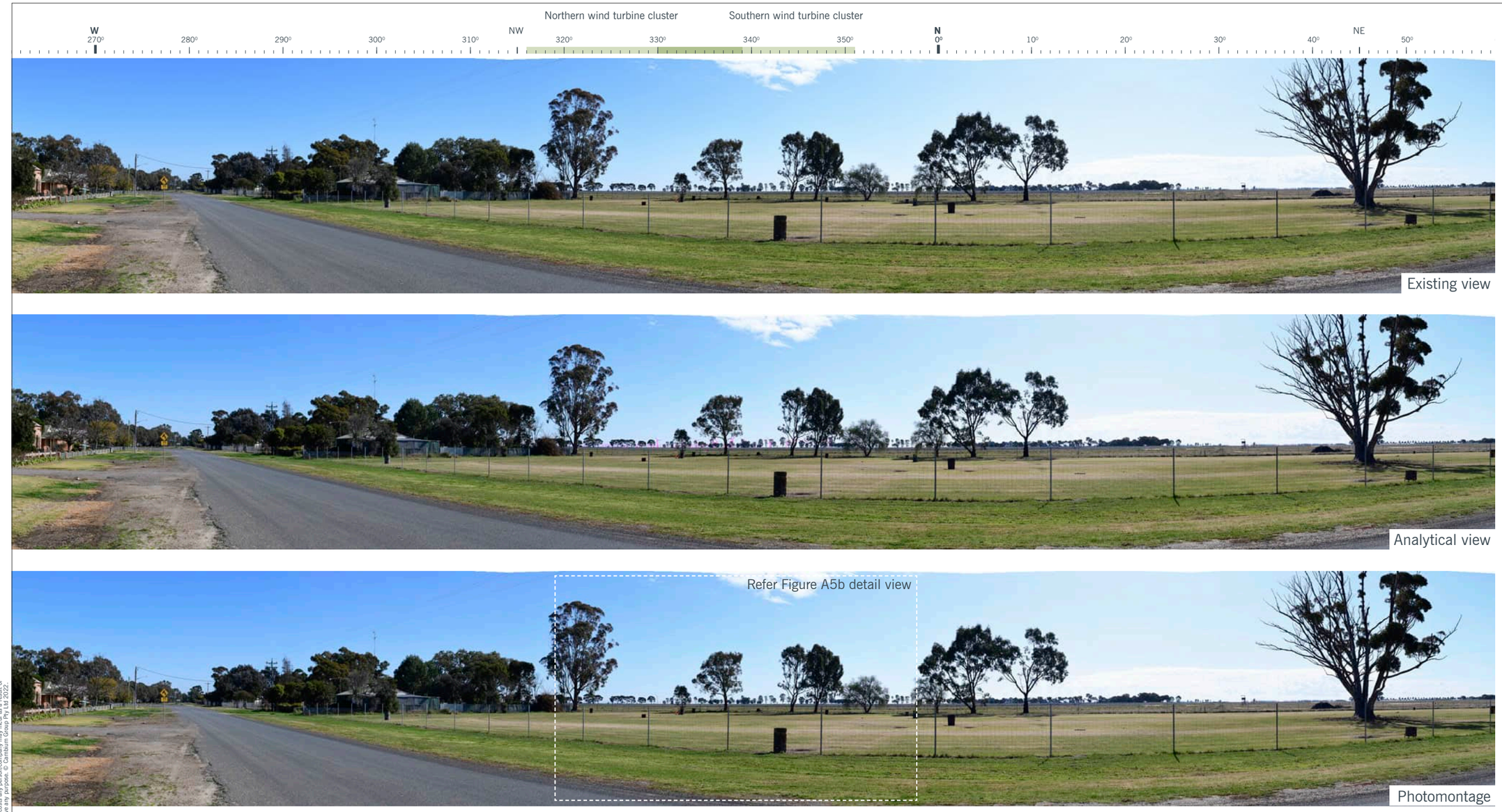
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	09:19	PM3 Kidman Way at Newell Highway	Nikon D850	50mm	40^{0}	111.65mAHD	E391235m, N6098589m	GDA94	MGA94	55	8.5km (W-179)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A5a

PM4 photomontage - Showground Road

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	12:05	PM4 Showground Road	Nikon D850	50mm	160°	111.65mAHD	E384895, N6087371m	GDA94	MGA94	55	10.2km (W-199)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A5b

PM4 detail view - Showground Road

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	12:05	PM4 Showground Road	Nikon D850	50mm	40°	111.65mAHD	E384895, N6087371m	GDA94	MGA94	55	10.2km (W-199)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A6a

PM5 photomontage - Jerilderie Racecourse trackside

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	12:23	PM5 Jerilderie Racecourse trackside	Nikon D850	50mm	180°	111.65mAHD	E384551m, N6087509m	GDA94	MGA94	55	10km (W-201)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A6b

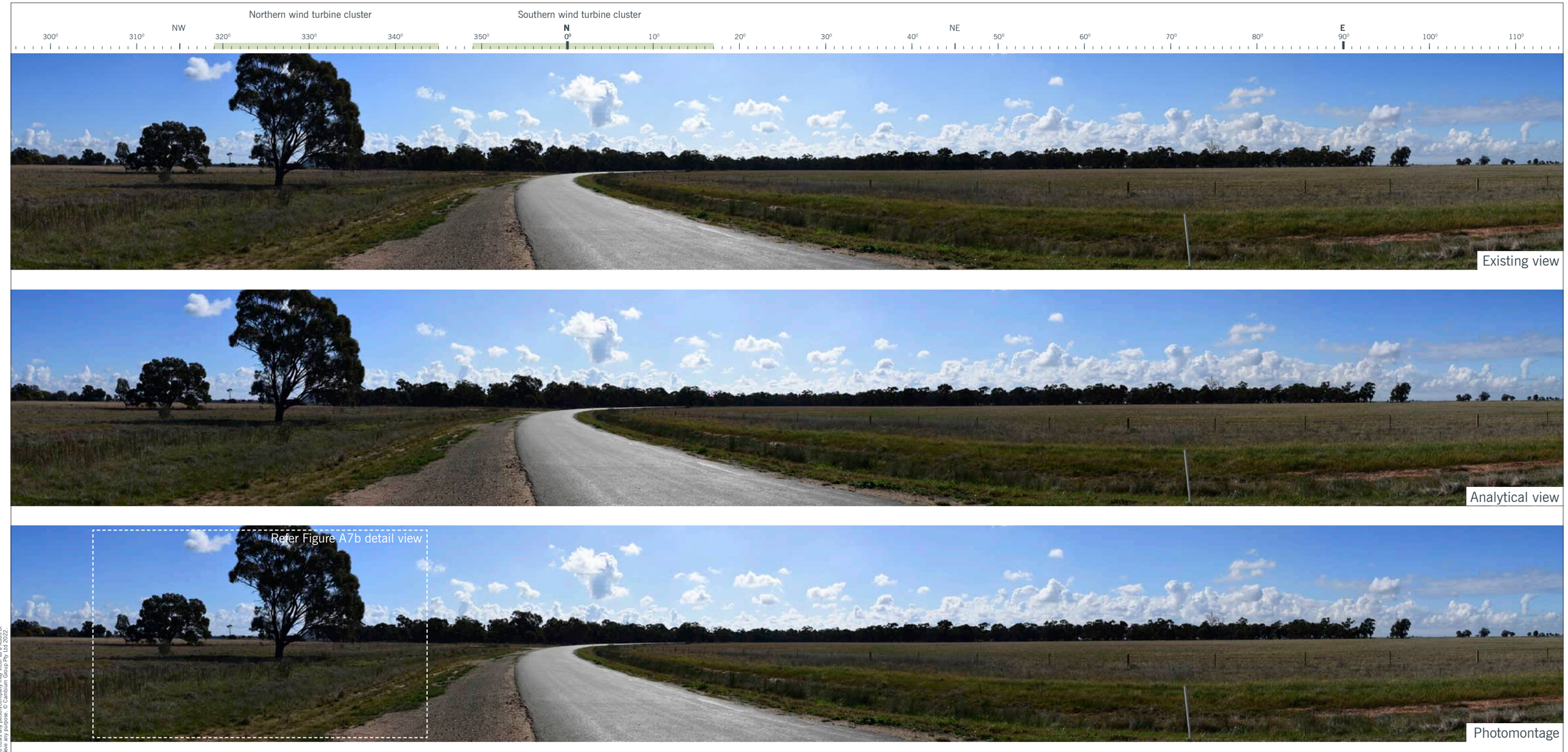
PM5 detail view - Jerilderie Racecourse trackside

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	12:23	PM5 Jerilderie Racecourse trackside	Nikon D850	50mm	40^{0}	111.65mAHD	E384551m, N6087509m	GDA94	MGA94	55	10km (W-201)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A7a
PM6 photomontage - Wilson Road

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	13:12	PM6 Wilson Road	Nikon D850	50mm	180°	108.65mAHD	E380157m, N6090407m	GDA94	MGA94	55	6.4km (W-201)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A7b

PM6 detail view - Wilson Road

GBD Landscape architecture

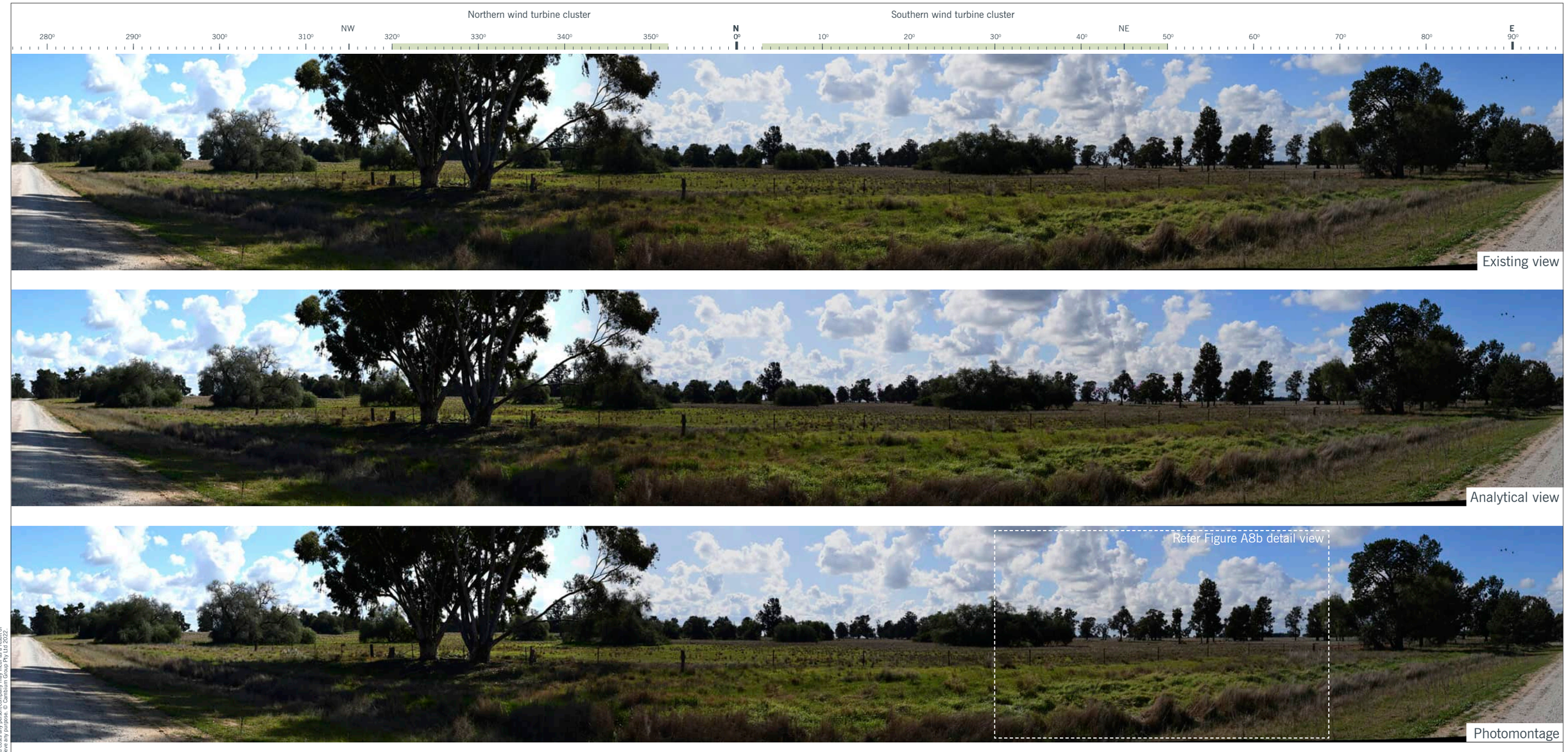
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	13:12	PM6 Wilson Road	Nikon D850	50mm	40^{0}	108.65mAHD	E380157m, N6090407m	GDA94	MGA94	55	6.4km (W-201)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A8a

PM7 photomontage - North Coree Road

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	13:28	PM7 North Coree Road	Nikon D850	50mm	180°	111.65mAHD	E377147m, N6093170m	GDA94	MGA94	55	4.5km (W-204)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A8b

PM7 detail view - North Coree Road

GBD Landscape architecture

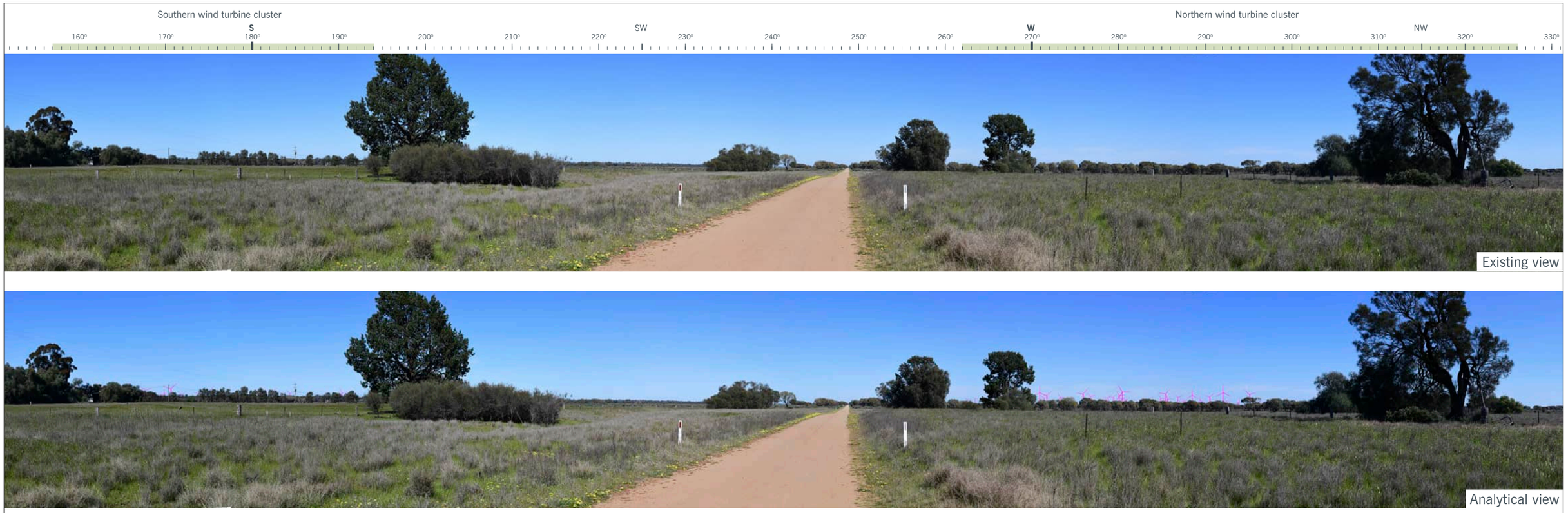
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	13:28	PM7 North Coree Road	Nikon D850	50mm	40^0	111.65mAHD	E377147m, N6093170m	GDA94	MGA94	55	4.5km (W-204)	Green Bean Design

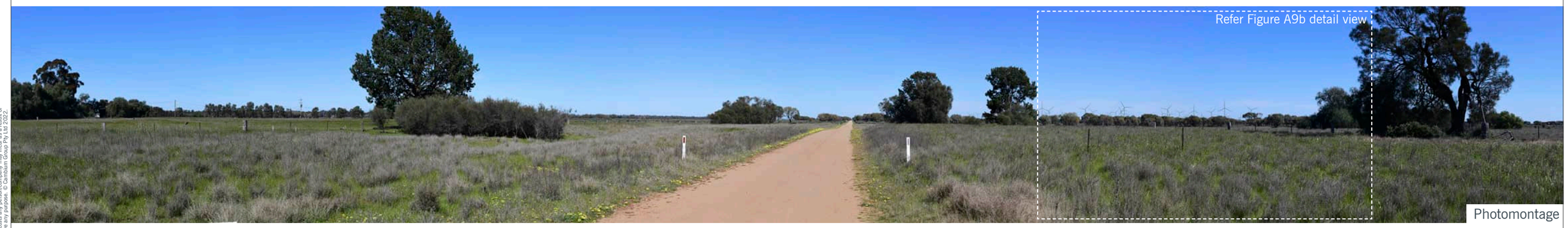
Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A9a

PM8 photomontage - Woodside Road

GBD Landscape architecture





Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	11:08	PM8 Woodside Road	Nikon D850	50mm	180°	111.65mAHD	E379484m, N6110767m	GDA94	MGA94	55	5.6km (W-152)	Green Bean Design

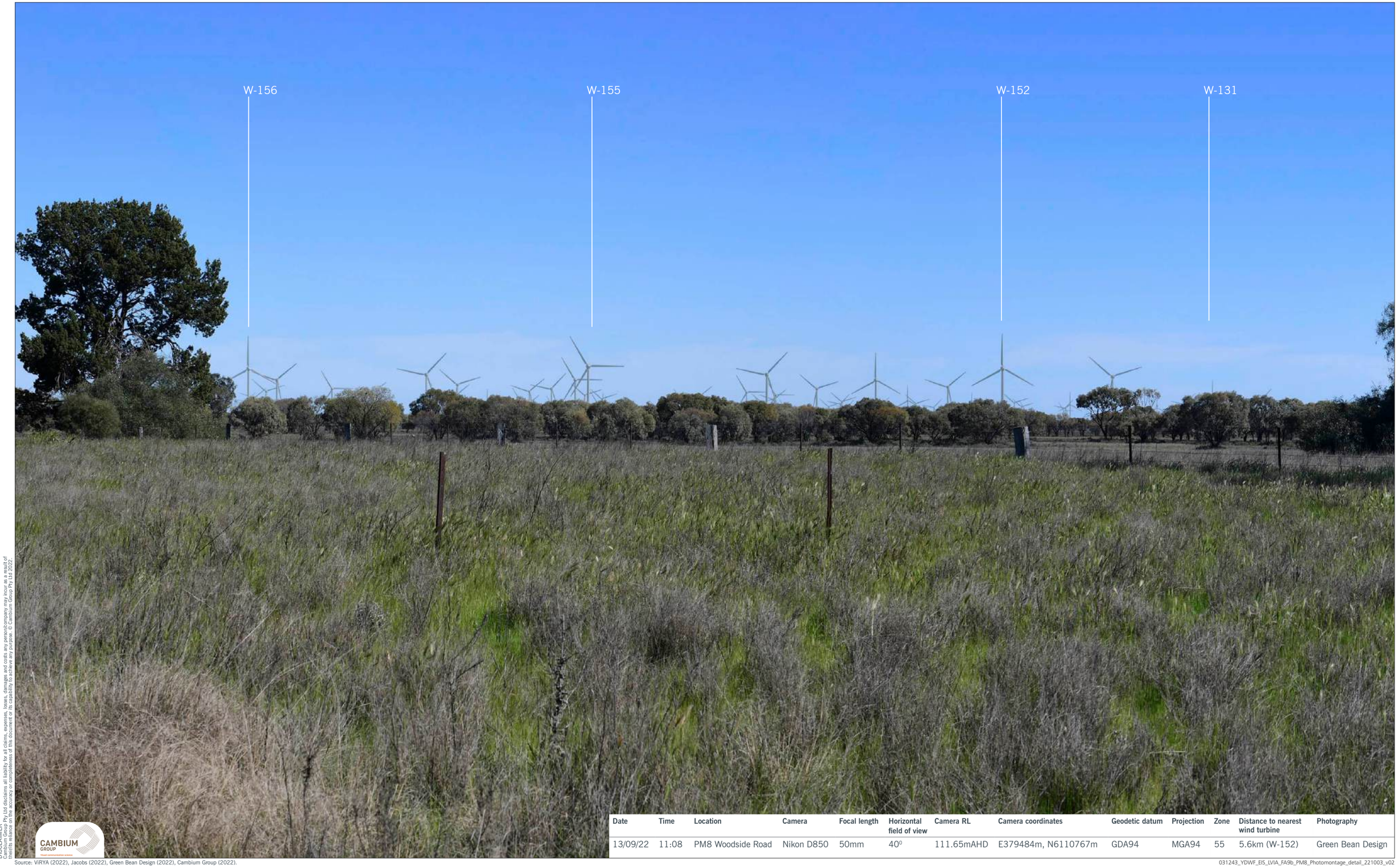
CAMBIUM GROUP

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A9b

PM8 detail view - Woodside Road

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	11:08	PM8 Woodside Road	Nikon D850	50mm	40^0	111.65mAHD	E379484m, N6110767m	GDA94	MGA94	55	5.6km (W-152)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

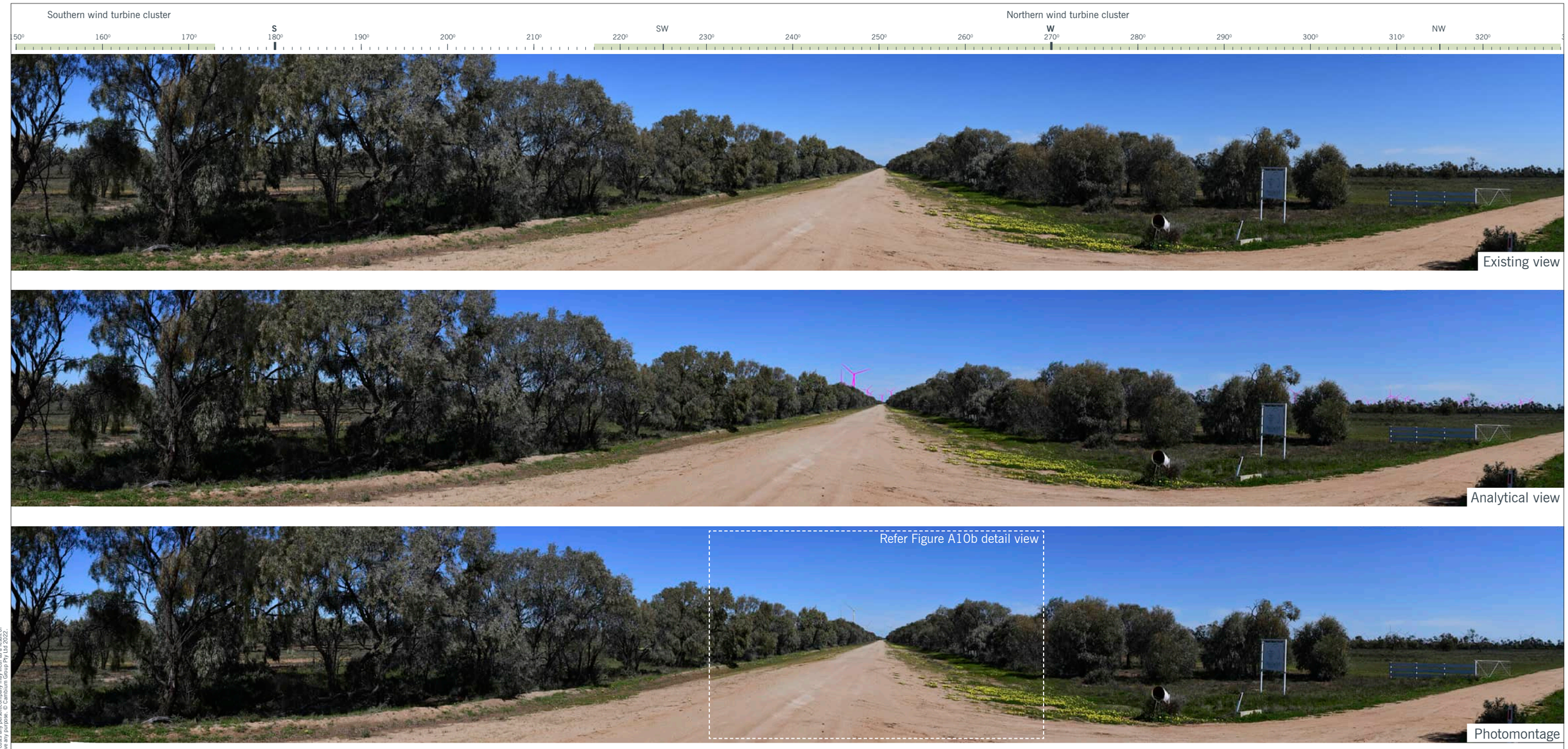
CAMBIUM GROUP

Figure A10a

PM9 photomontage - Liddles Lane

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	11:40	PM9 Jerrys Lane	Nikon D850	50mm	180°	111.65mAHD	E376207m, N6114675m	GDA94	MGA94	55	2.6km (W-152)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A10b

PM9 detail view - Liddles Lane

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	11:40	PM9 Jerrys Lane	Nikon D850	50mm	40^{0}	111.65mAHD	E376207m, N6114675m	GDA94	MGA94	55	2.6km (W-152)	Green Bean Design

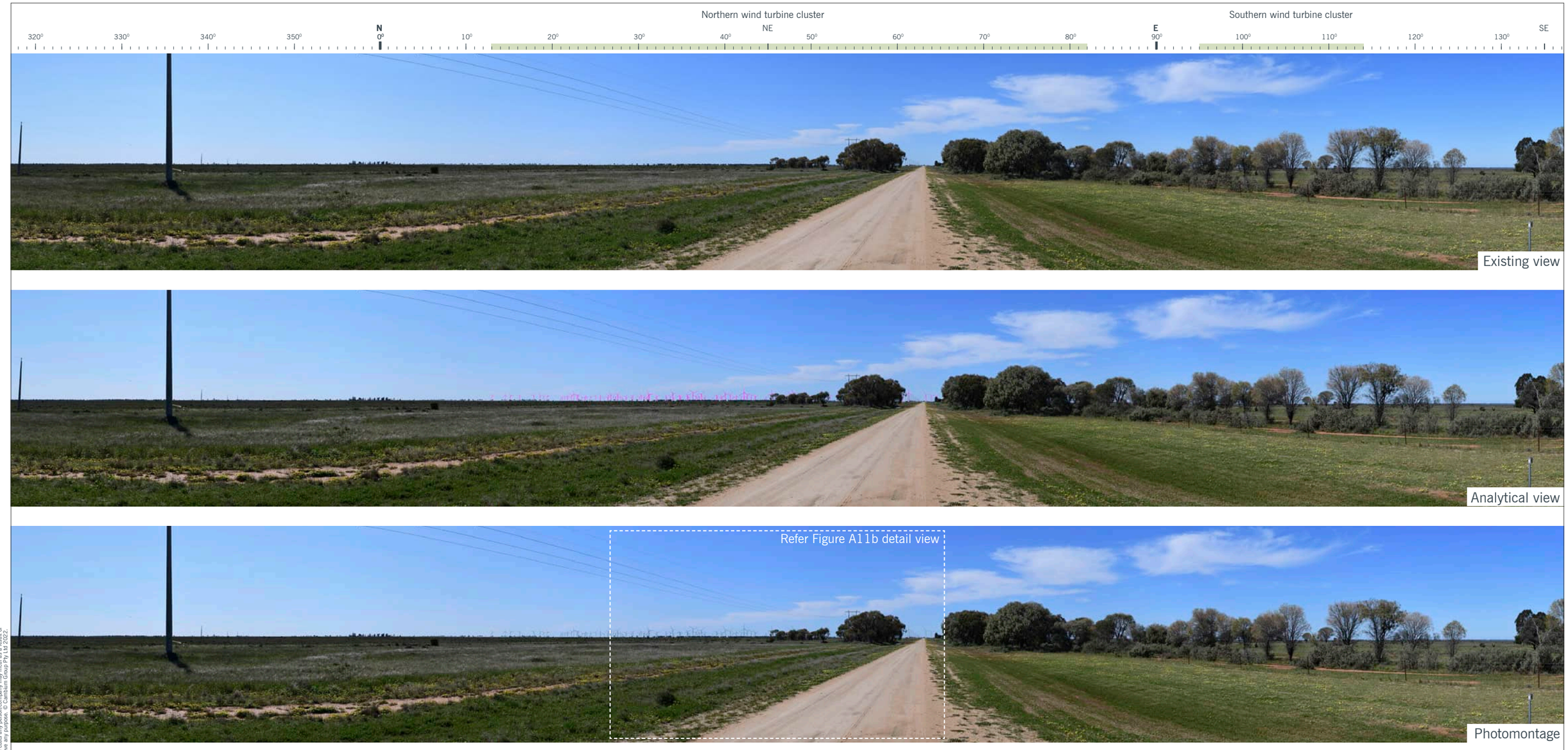
Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A11a

PM10 photomontage - Moonbria Road

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	14:17	PM10 Moonbria Road	Nikon D850	50mm	180°	103.65mAHD	E355585m, N6107561m	GDA94	MGA94	55	8km (W-175)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A11b

PM10 detail view - Moonbria Road

GBD Landscape architecture

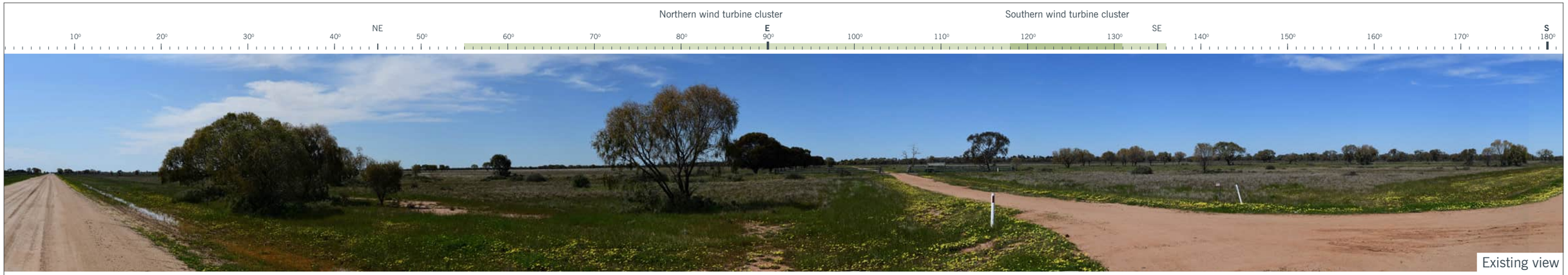
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	14:17	PM10 Moonbria Road	Nikon D850	50mm	40^0	103.65mAHD	E355585m, N6107561m	GDA94	MGA94	55	8km (W-175)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A12a

PM11 photomontage - Carrathool Road

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	13:33	PM11 Carathool Road	Nikon D850	50mm	180º	104.65mAHD	E352553m, N6120500m	GDA94	MGA94	55	6.5km (W-046)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A12b

PM11 detail view - Carrathool Road

GBD Landscape architecture

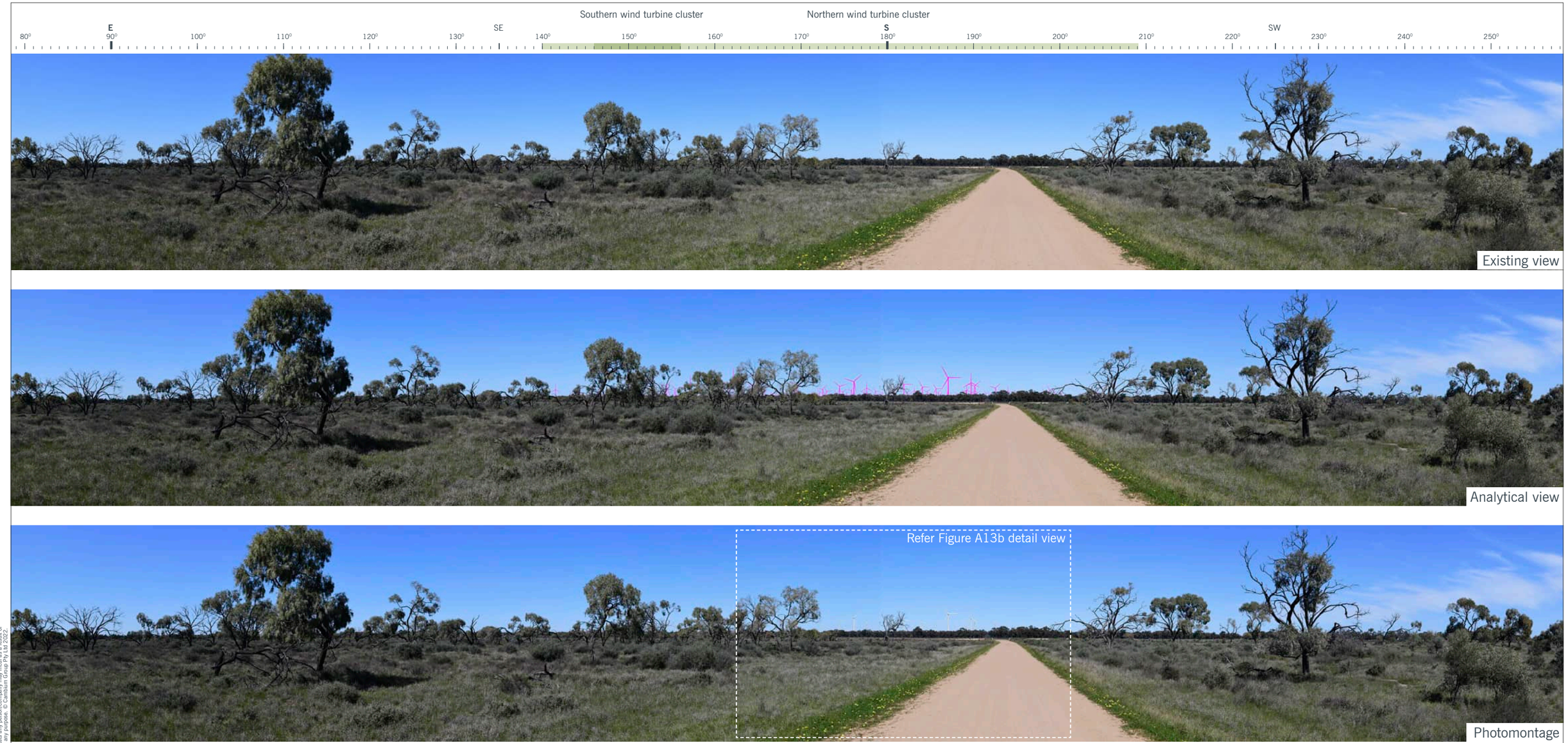
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	13:33	PM11 Carathool Road	Nikon D850	50mm	40^{0}	104.65mAHD	E352553m, N6120500m	GDA94	MGA94	55	6.5km (W-046)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A13a

PM12 photomontage - Goolgumbla Road

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	12:40	PM12 Goolgumbla Road	Nikon D850	50mm	180°	111.65mAHD	E363724m, N6131663m	GDA94	MGA94	55	3.7km (W-001)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A13b

PM12 detail view - Goolgumbla Road

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	12:40	PM12 Goolgumbla Road	Nikon D850	50mm	40°	111.65mAHD	E363724m, N6131663m	GDA94	MGA94	55	3.7km (W-001)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A14a

PM13 photomontage - Nine Mile Lane

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	10:14	PM13 Nine Mile Lane	Nikon D850	50mm	180⁰	106.65mAHD	E376858m, N6097848m	GDA94	MGA94	55	2.2km (W-208)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A14b

PM13 detail view - Nine Mile Lane

GBD Landscape architecture

Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
13/09/22	10:14	PM13 Nine Mile Lane	Nikon D850	50mm	40^{0}	106.65mAHD	E376858m, N6097848m	GDA94	MGA94	55	2.2km (W-208)	Green Bean Design

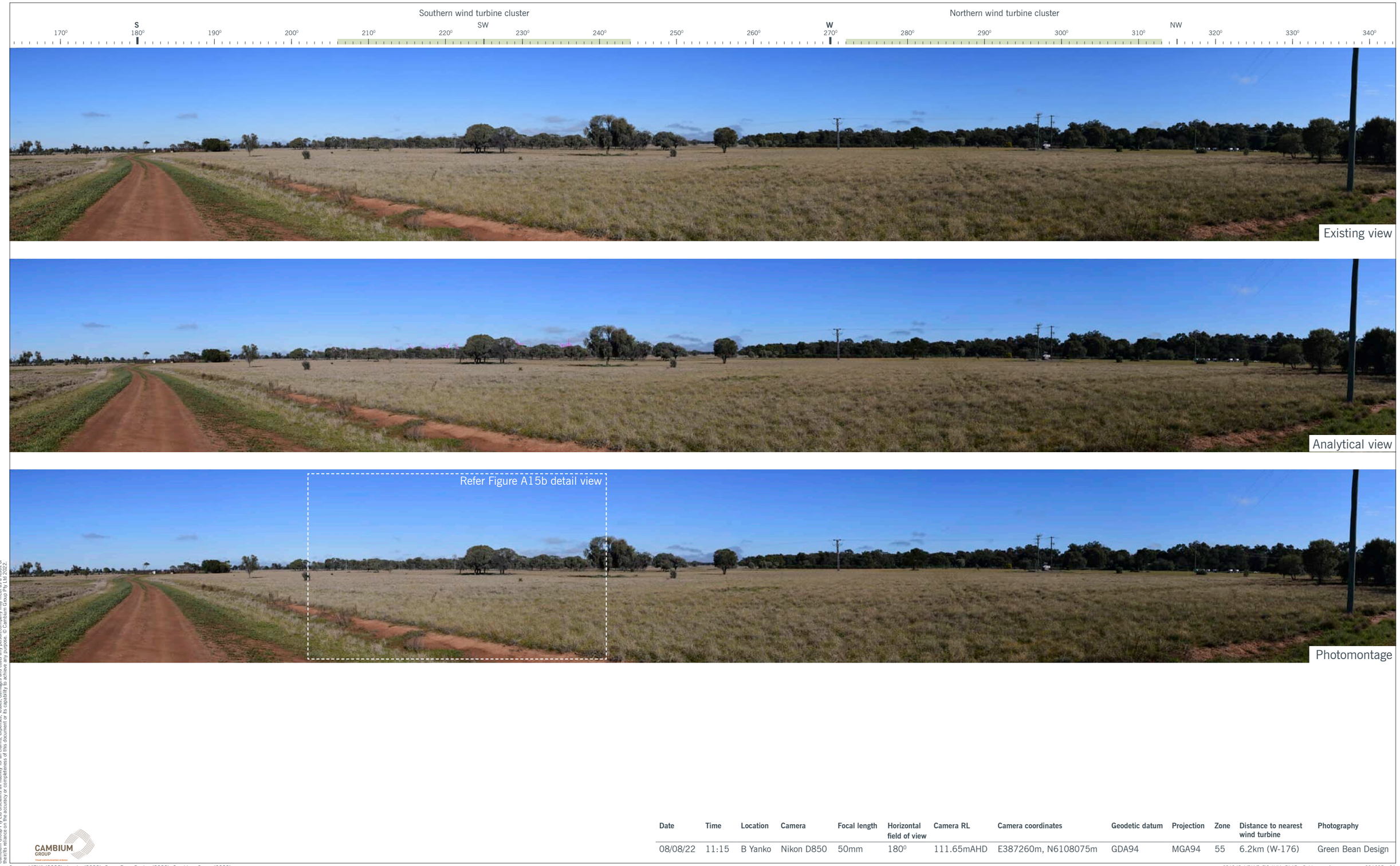
CAMBIUM GROUP

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A15a

B Yanco photomontage

GBD Landscape architecture



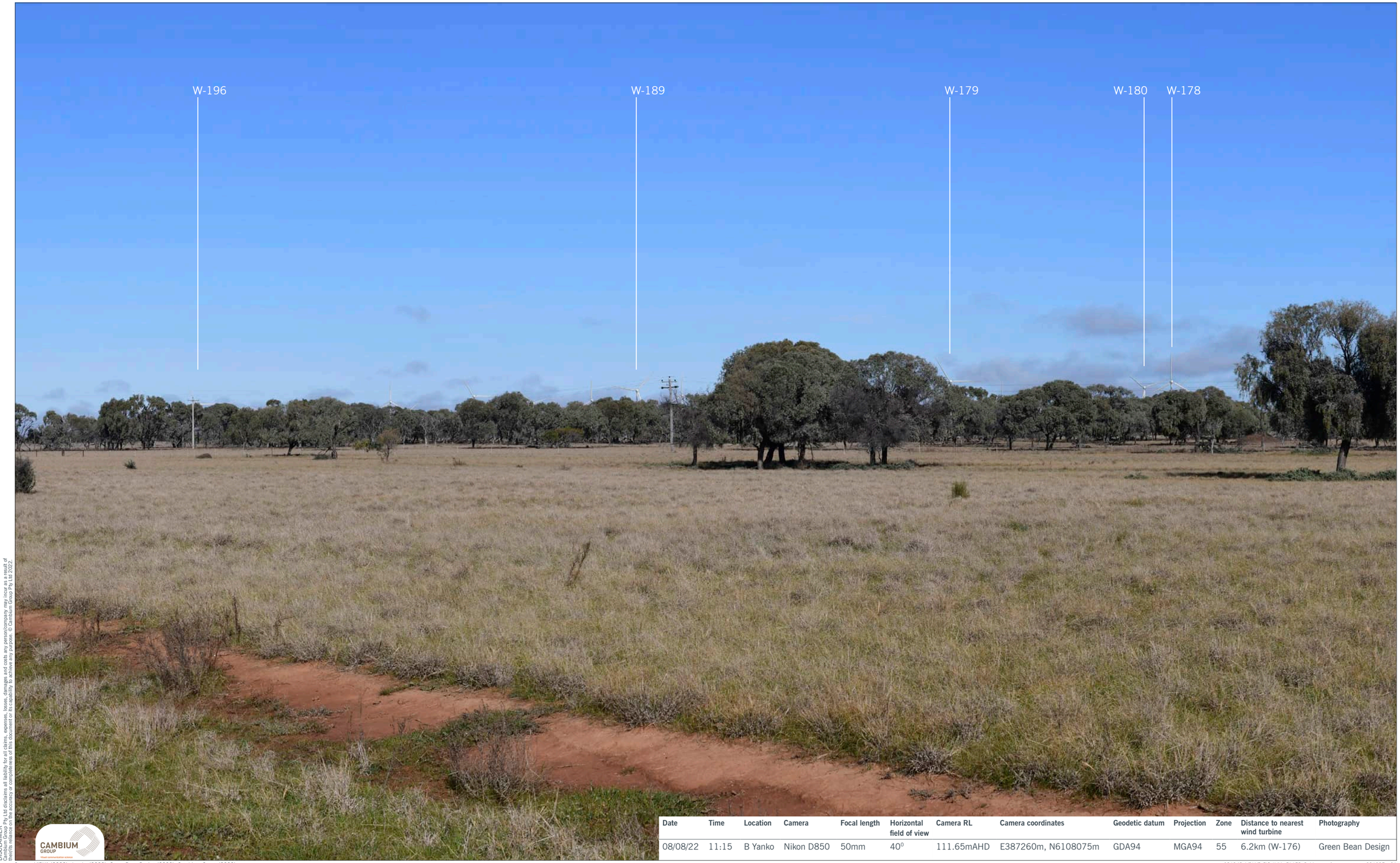
Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	11:15	B Yanko	Nikon D850	50mm	180°	111.65mAHD	E387260m, N6108075m	GDA94	MGA94	55	6.2km (W-176)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure A15b

B Yanco detail view

GBD Landscape architecture



Date	Time	Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine	Photography
08/08/22	11:15	B Yanko	Nikon D850	50mm	40^0	111.65mAHD	E387260m, N6108075m	GDA94	MGA94	55	6.2km (W-176)	Green Bean Design

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

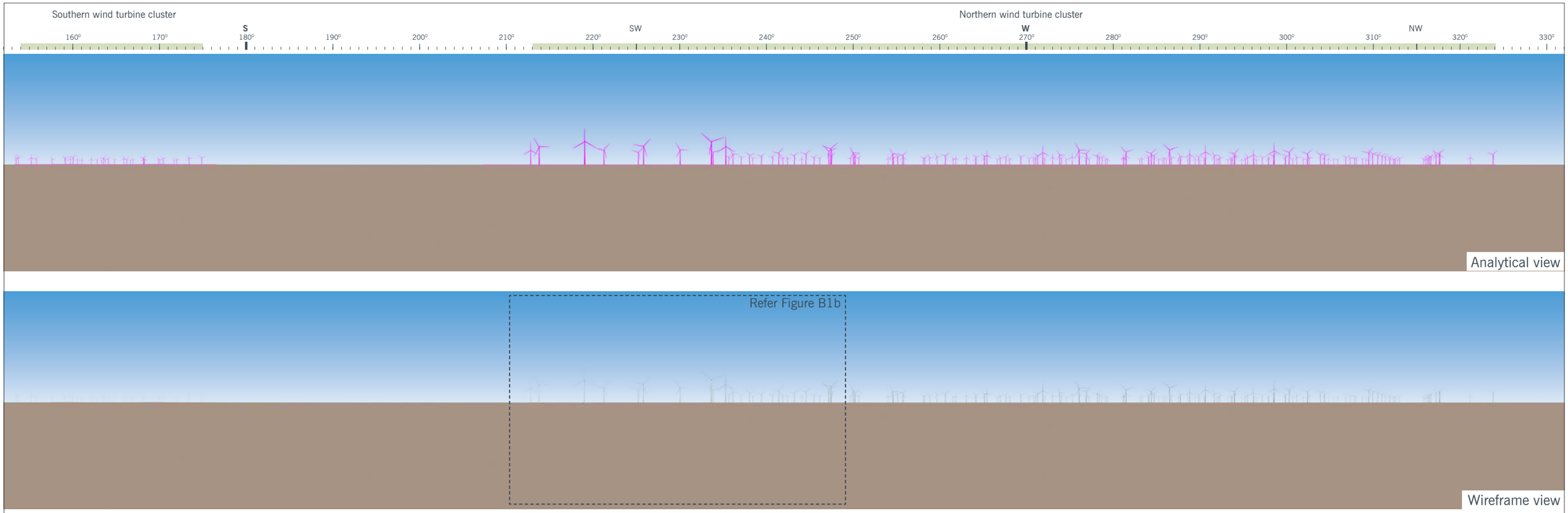
Appendix B
Wireframes

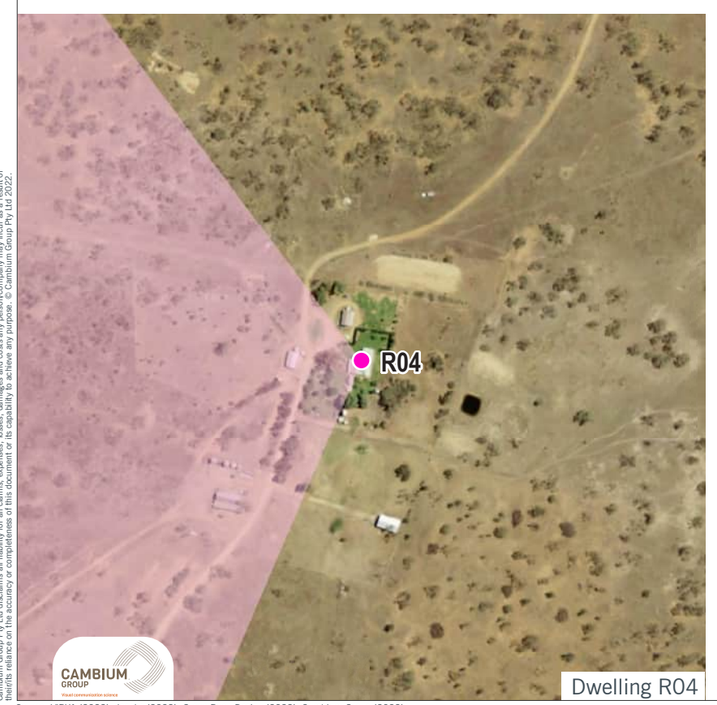
Figure B1a

Dwelling RO4 wireframe

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**





Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

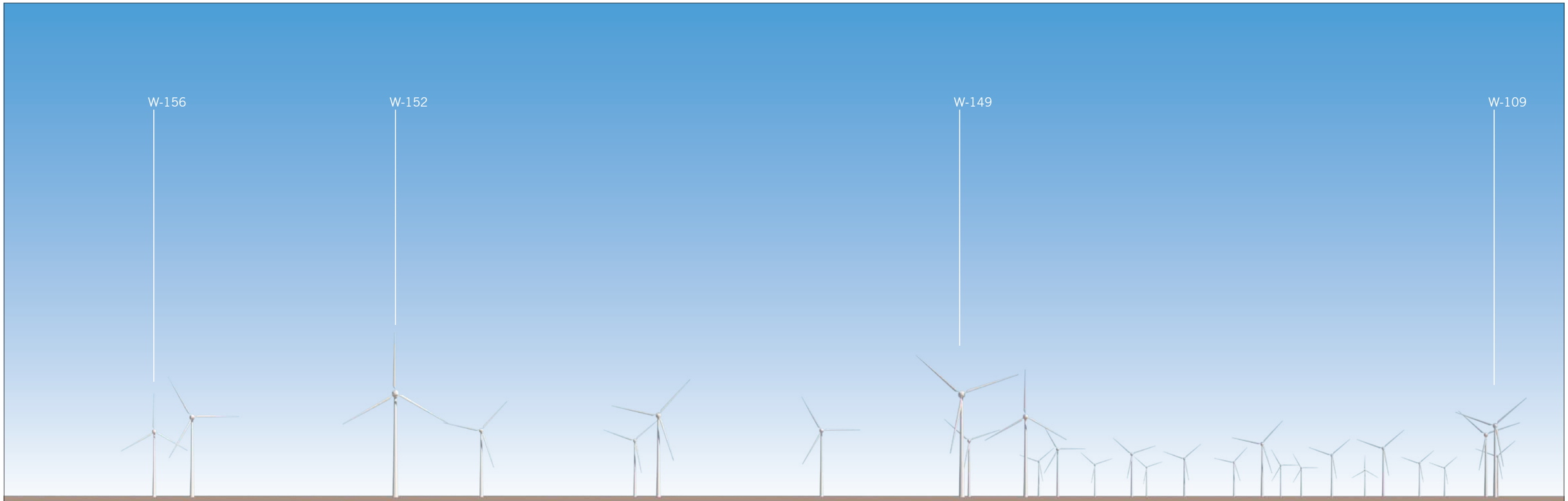
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R04	Virtual	50mm	180°	111.5mAHD	E376514m, N6115707m	GDA94	MGA94	55	3.6km (W-152)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B1b

Dwelling RO4 wireframe detail

GBD Landscape architecture



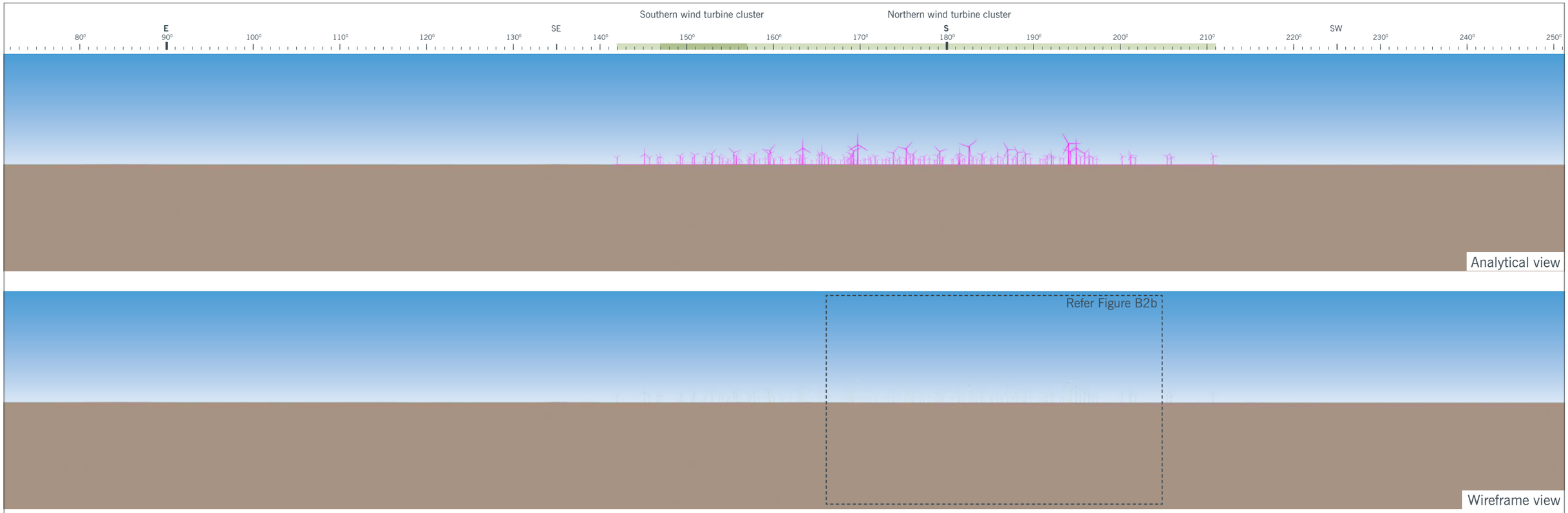
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R04	Virtual	50mm	40^0	111.5mAHD	E376514m, N6115707m	GDA94	MGA94	55	3.6km (W-152)

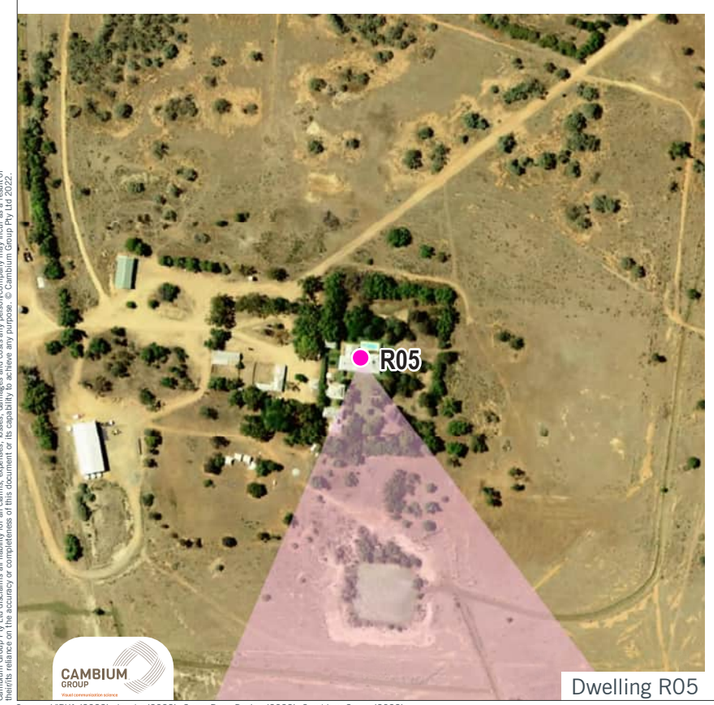
Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B2a

Dwelling R05 wireframe

GBD Landscape architecture





Dwelling R05

Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R05	Virtual	50mm	180^0	109mAHD	E364284m, N6131898m	GDA94	MGA94	55	4km (W-001)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B2b

Dwelling RO5 wireframe detail

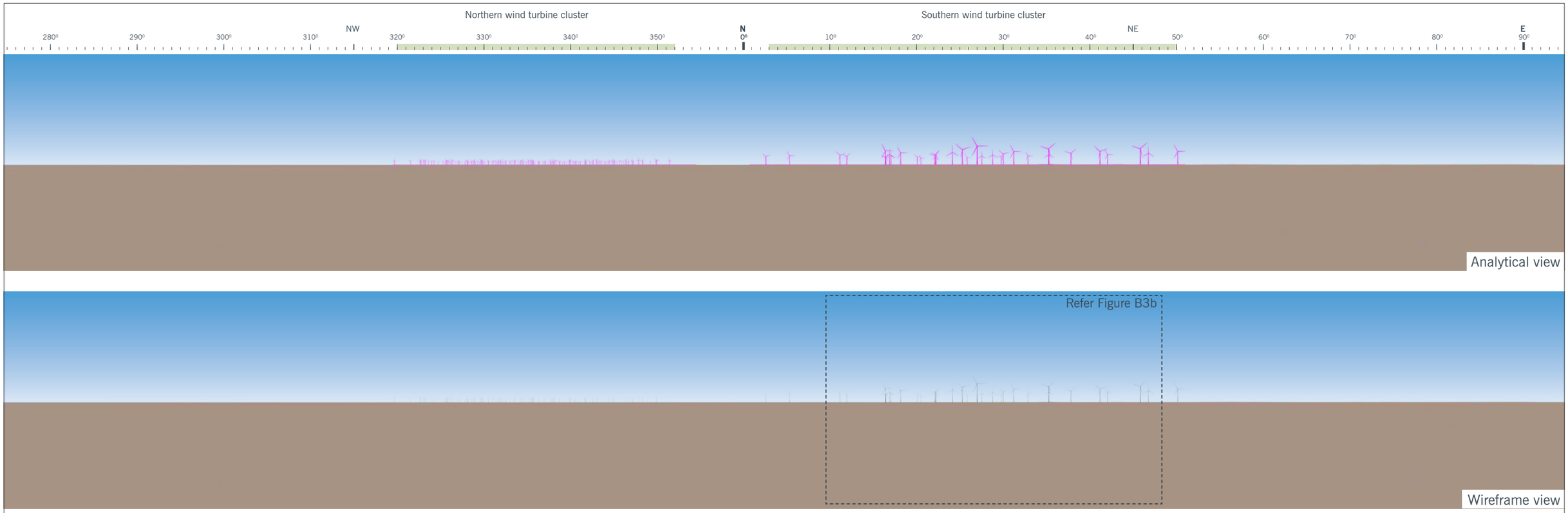
GBD Landscape architecture

Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R05	Virtual	50mm	40^0	109mAHD	E364284m, N6131898m	GDA94	MGA94	55	4km (W-001)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B3a
Dwelling RO9 wireframe

GBD Landscape architecture



Dwelling R09

Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

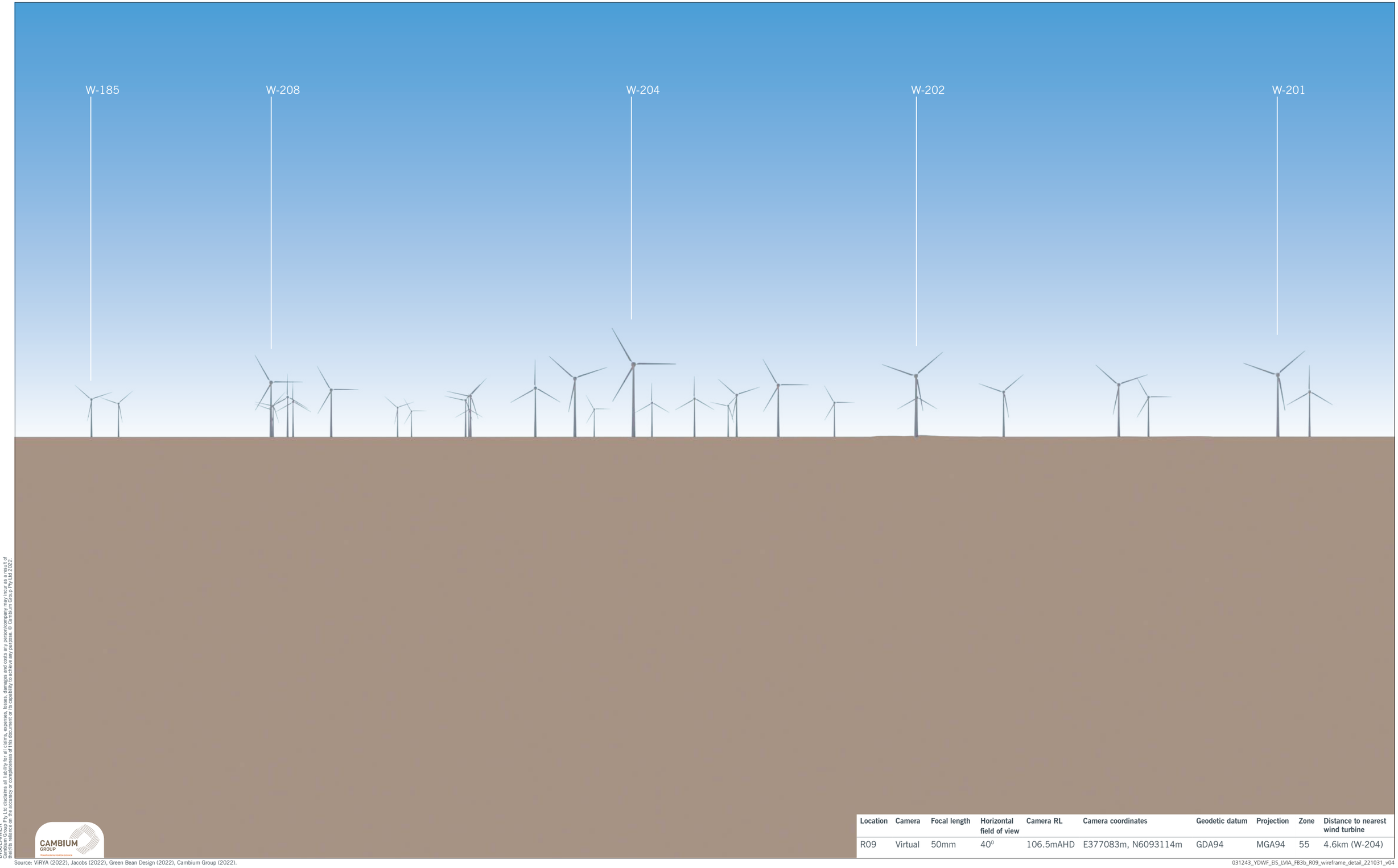
Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R09	Virtual	50mm	180°	106.5mAHD	E377083m, N6093114m	GDA94	MGA94	55	4.6km (W-204)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B3b
Dwelling RO9 wireframe detail

GBD
Landscape architecture

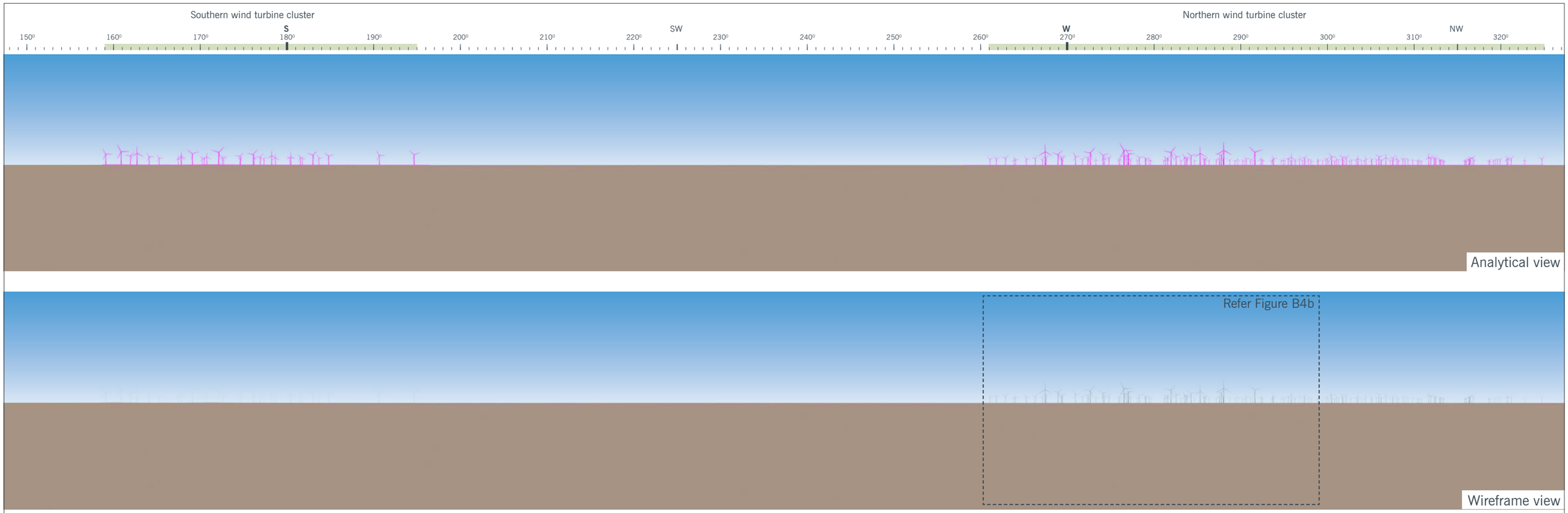


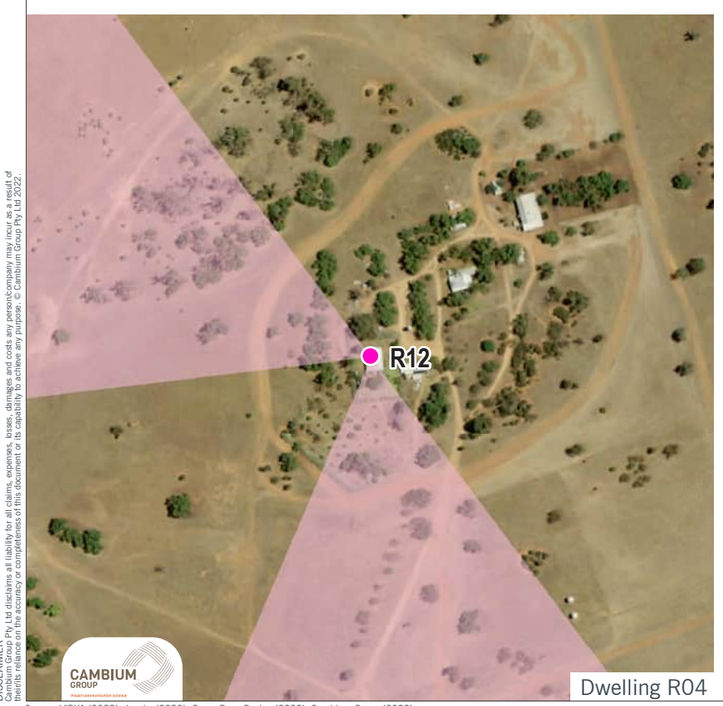
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R09	Virtual	50mm	40^0	106.5mAHD	E377083m, N6093114m	GDA94	MGA94	55	4.6km (W-204)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B4a
Dwelling R12 wireframe

GBD Landscape architecture





Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

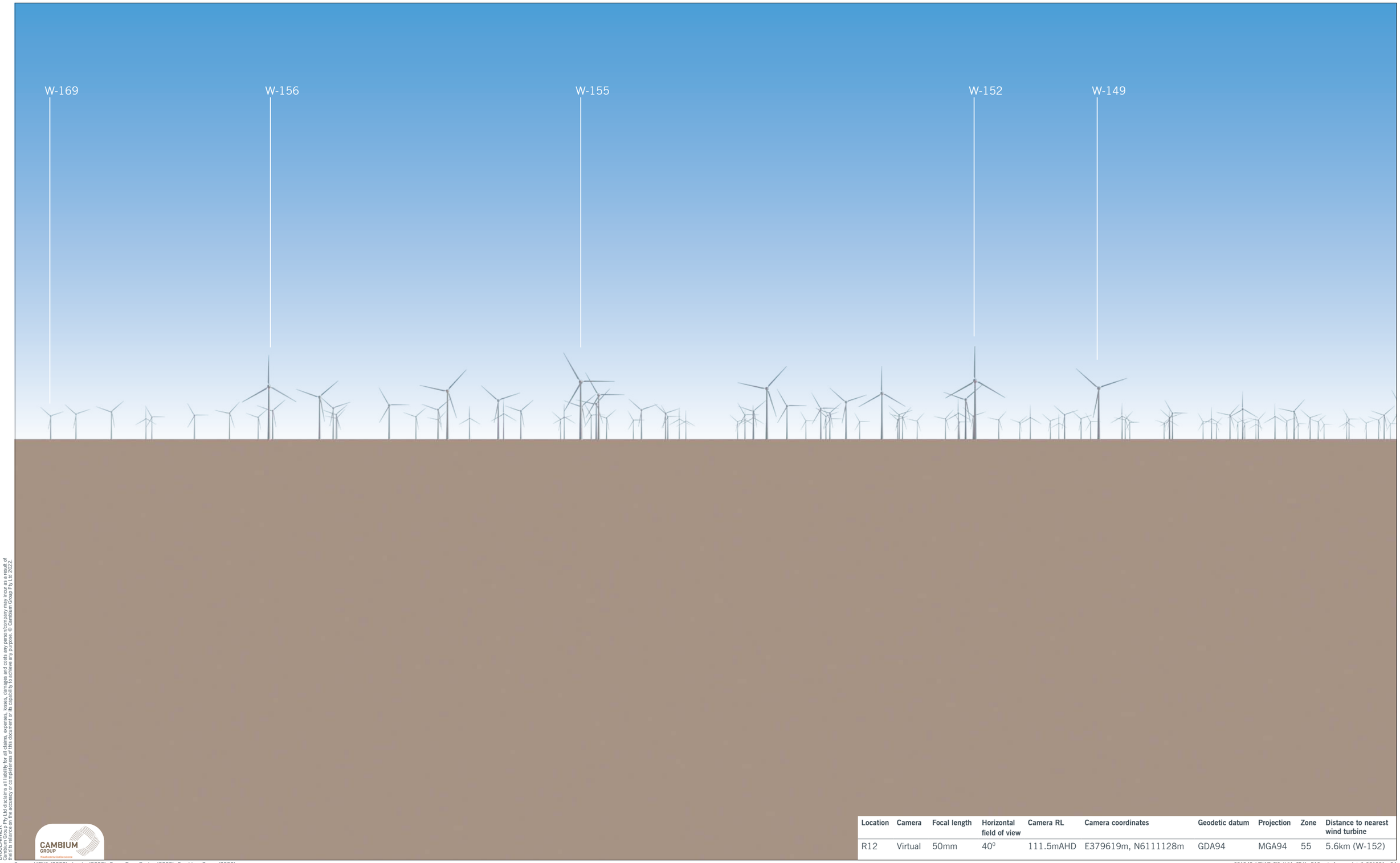
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R12	Virtual	50mm	180º	111.5mAHD	E379619m, N6111128m	GDA94	MGA94	55	5.6km (W-152)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B4b

Dwelling R12 wireframe detail

GBD Landscape architecture



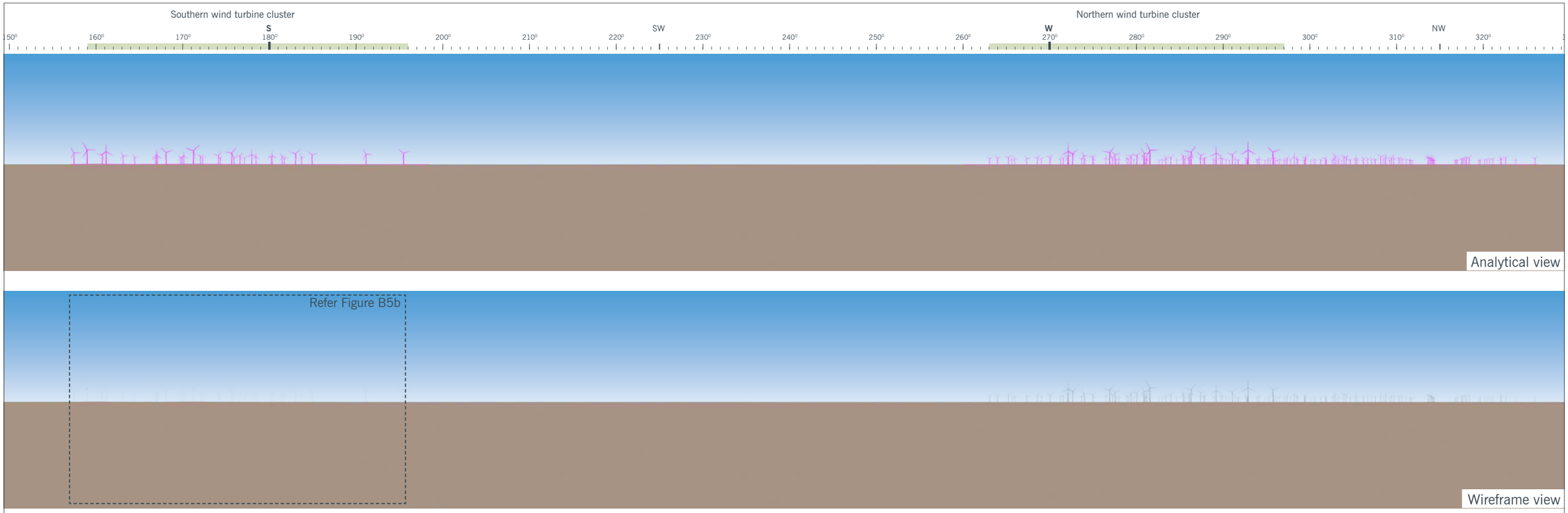
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R12	Virtual	50mm	40^{0}	111.5mAHD	E379619m, N6111128m	GDA94	MGA94	55	5.6km (W-152)

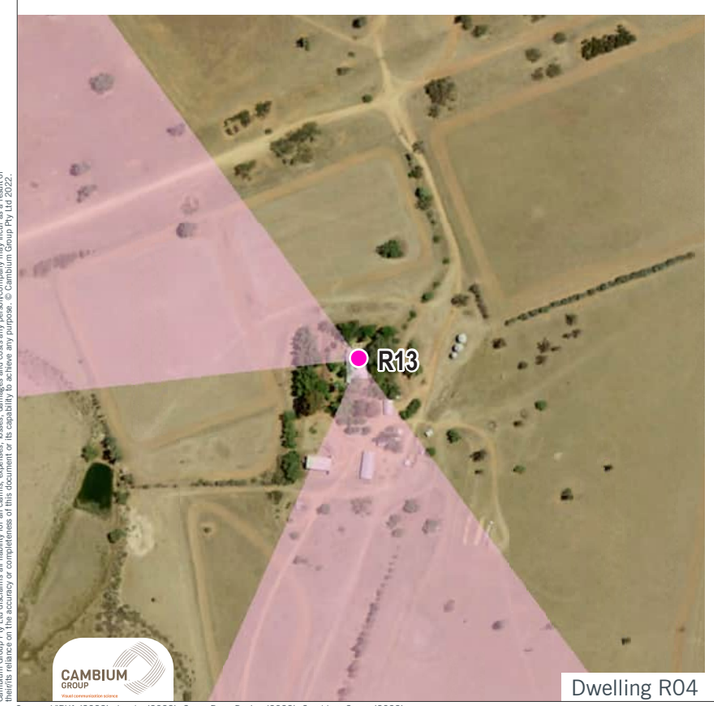
CAMBIUM GROUP

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B5a
Dwelling R13 wireframe

GBD Landscape architecture





Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

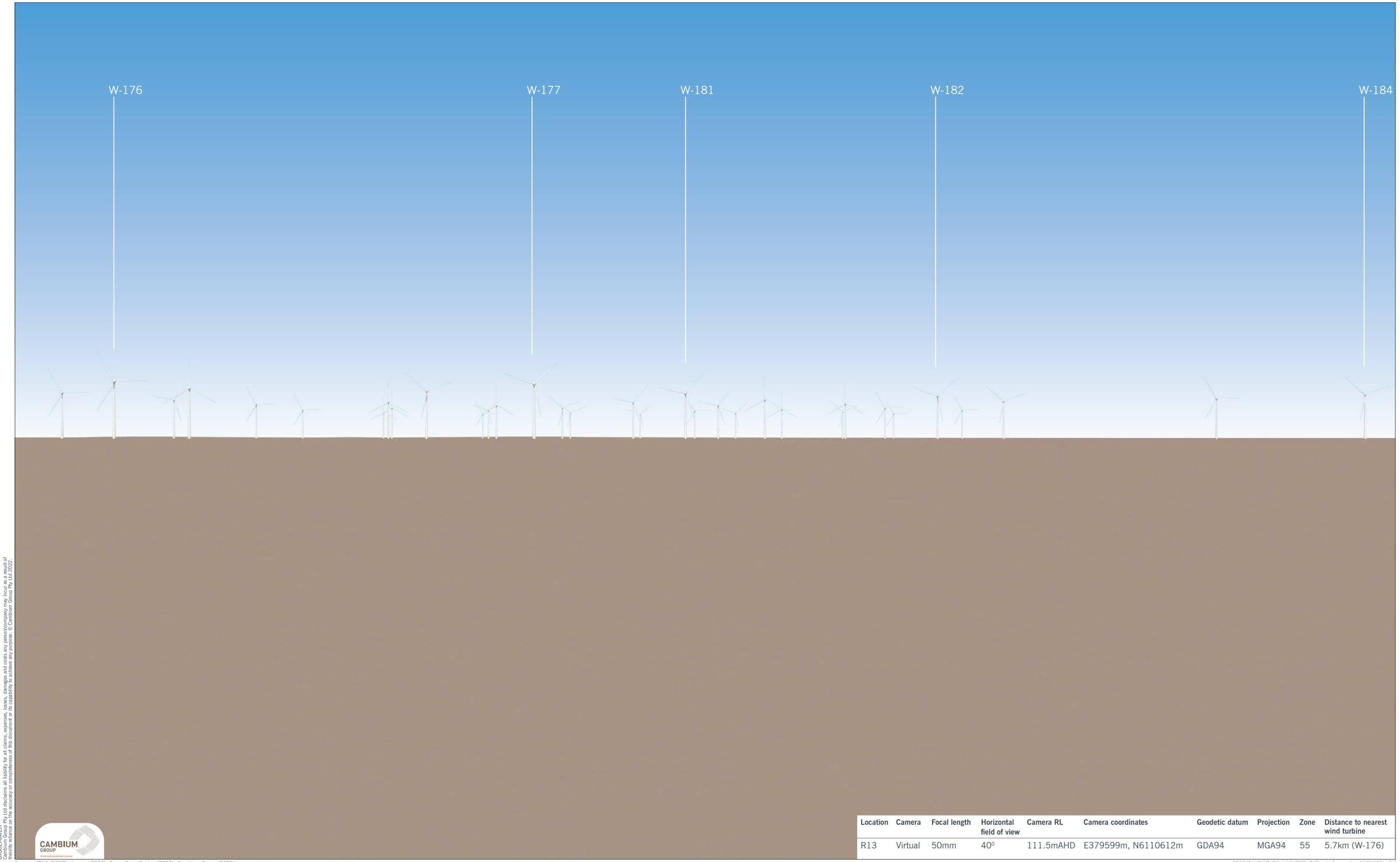
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R13	Virtual	50mm	180^0	111.5mAHD	E379599m, N6110612m	GDA94	MGA94	55	5.7km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B5b

Dwelling R13 wireframe detail

GBD Landscape architecture



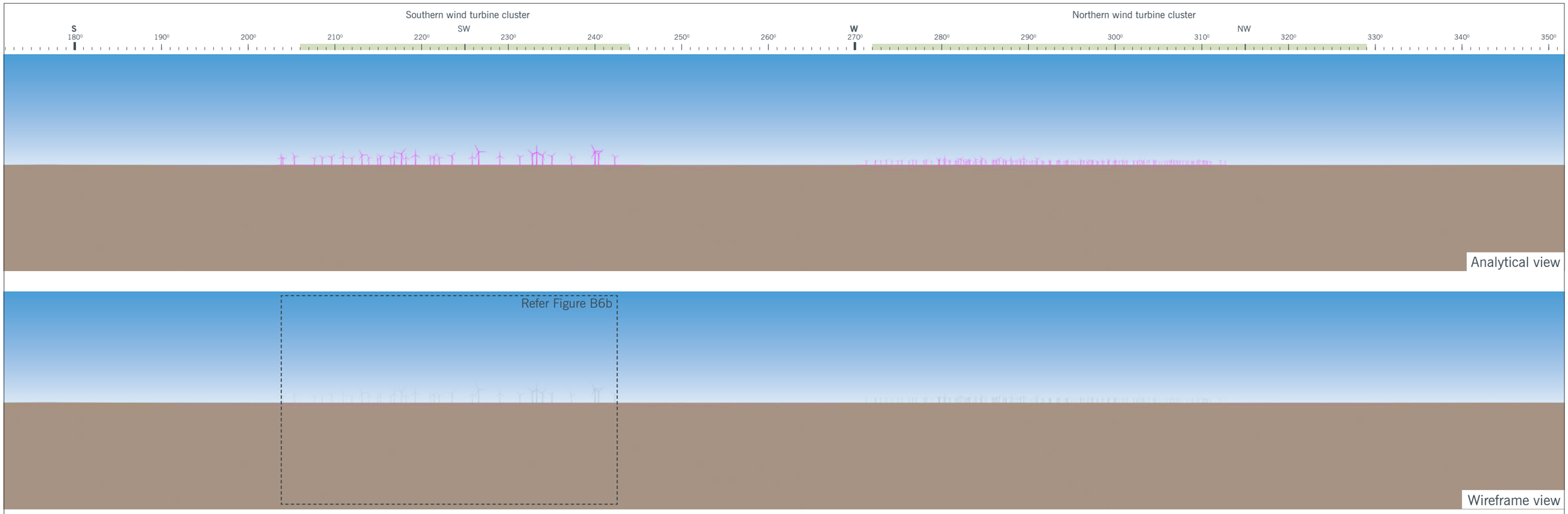
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R13	Virtual	50mm	40^{0}	111.5mAHD	E379599m, N6110612m	GDA94	MGA94	55	5.7km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B6a
Dwelling R14 wireframe

GBD Landscape architecture

YANCO DELTA WIND FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



Dwelling R04

Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

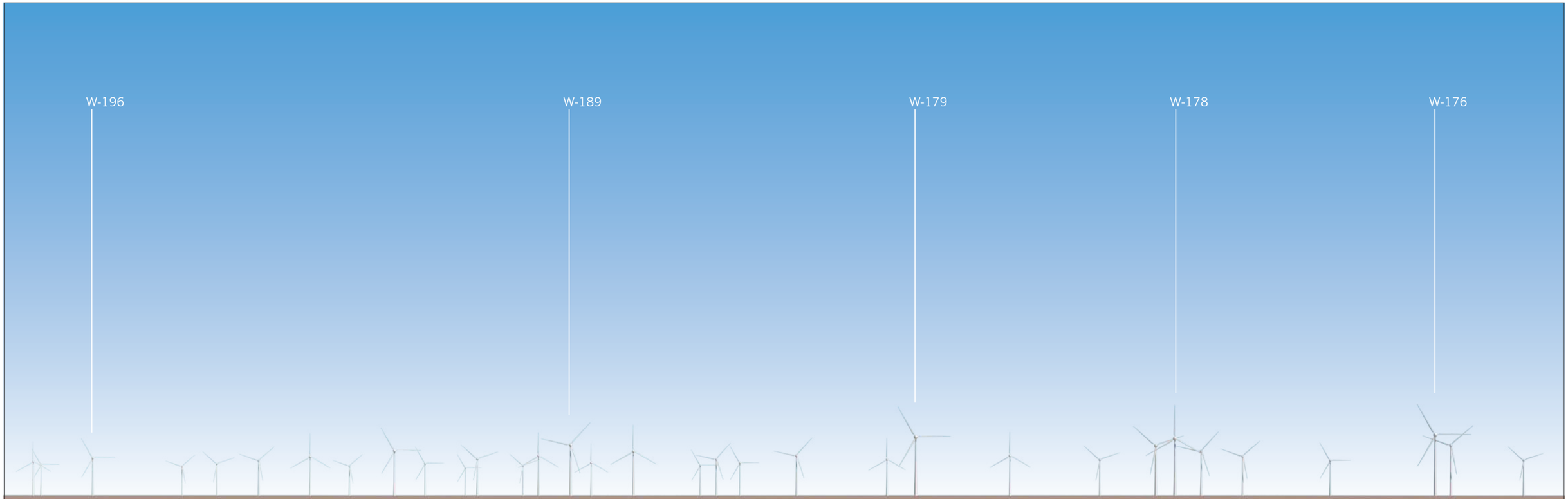
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R14	Virtual	50mm	180^0	111.5mAHD	E387027m, N6108278m	GDA94	MGA94	55	6.1km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B6b

Dwelling R14 wireframe detail

GBD Landscape architecture

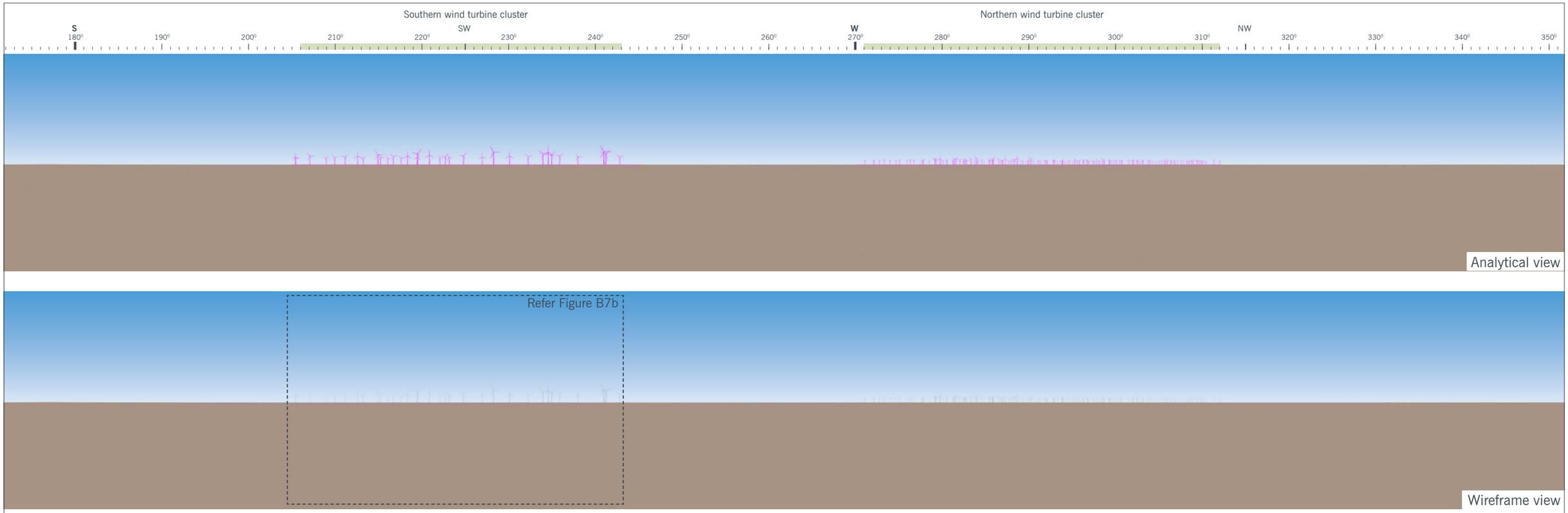


Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R14	Virtual	50mm	40^0	111.5mAHD	E387027m, N6108278m	GDA94	MGA94	55	6.1km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B7a
Dwelling R16 wireframe

GBD Landscape architecture



Dwelling R04

Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

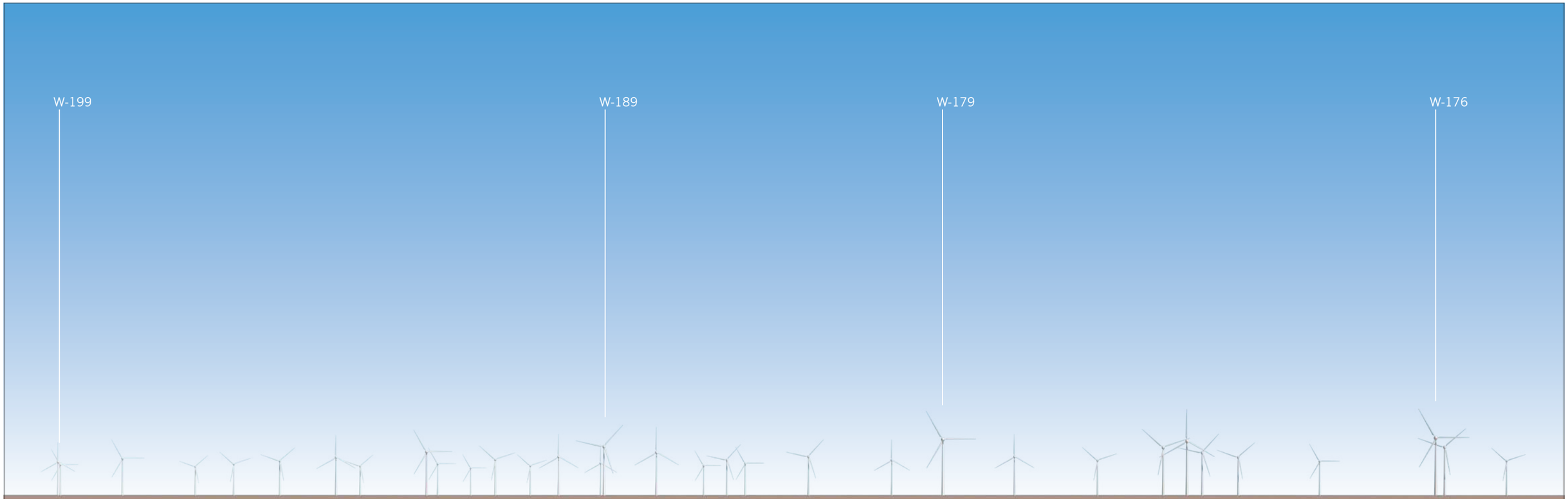
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R16	Virtual	50mm	180°	111.5mAHD	E387403m, N6108371m	GDA94	MGA94	55	6.5km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B7b

Dwelling R16 wireframe detail

GBD Landscape architecture

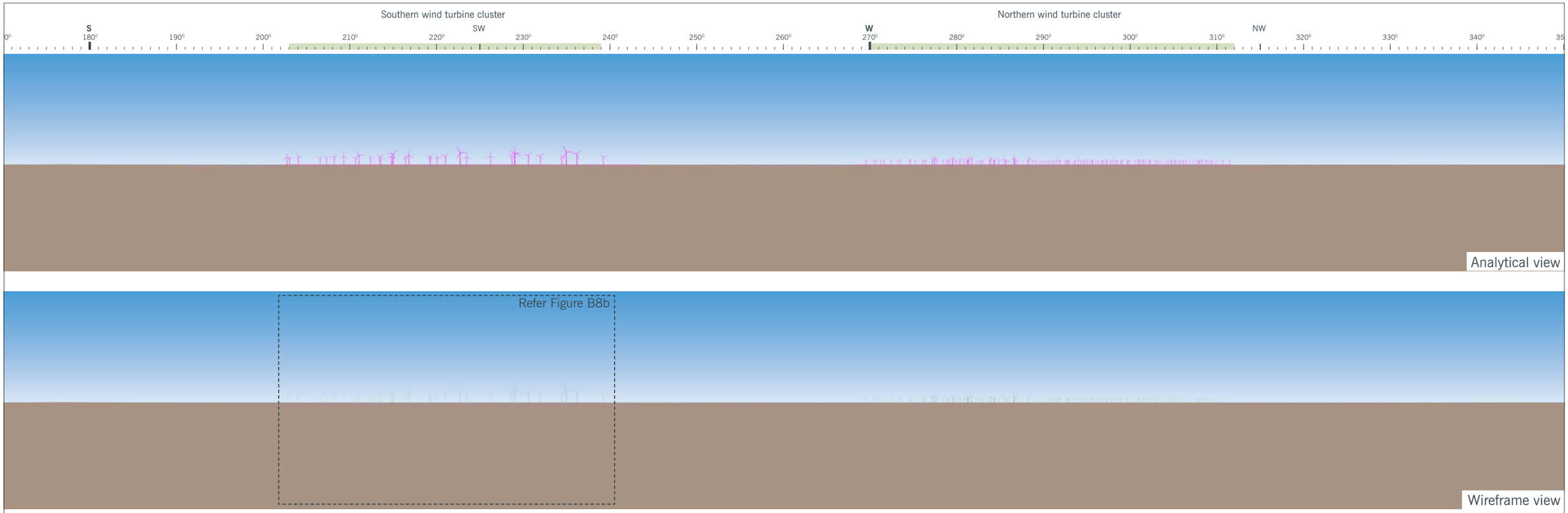


Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R16	Virtual	50mm	40^{0}	111.5mAHD	E387403m, N6108371m	GDA94	MGA94	55	6.5km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B8a
Dwelling R17 wireframe

GBD Landscape architecture



Dwelling R04

Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

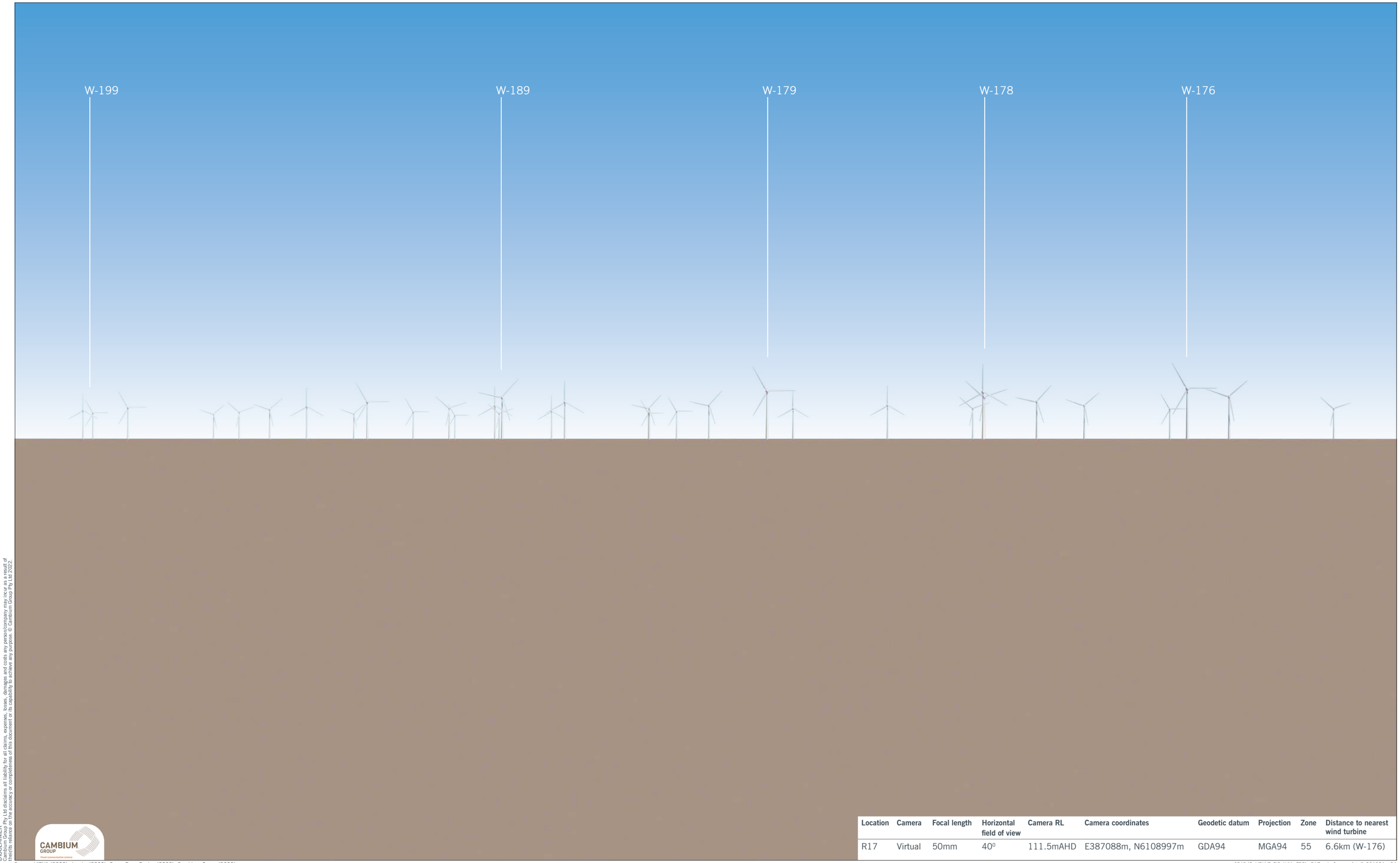
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R17	Virtual	50mm	180°	111.5mAHD	E387088m, N6108997m	GDA94	MGA94	55	6.6km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B8b

Dwelling R17 wireframe detail

GBD Landscape architecture



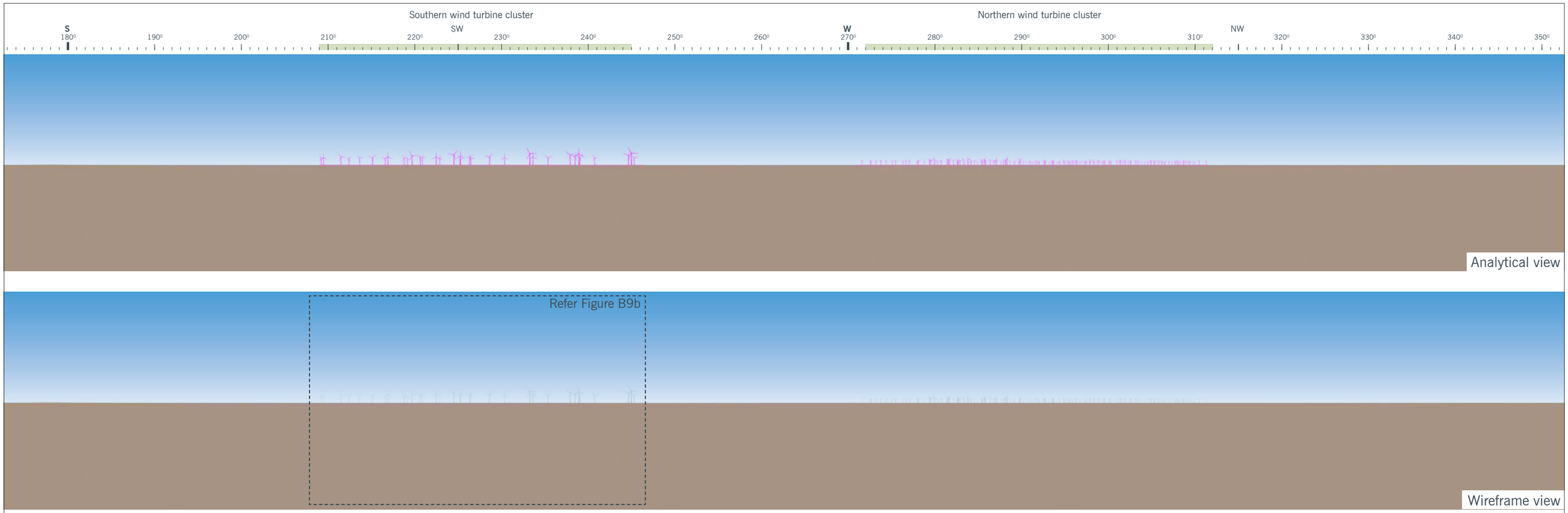
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R17	Virtual	50mm	40^{0}	111.5mAHD	E387088m, N6108997m	GDA94	MGA94	55	6.6km (W-176)

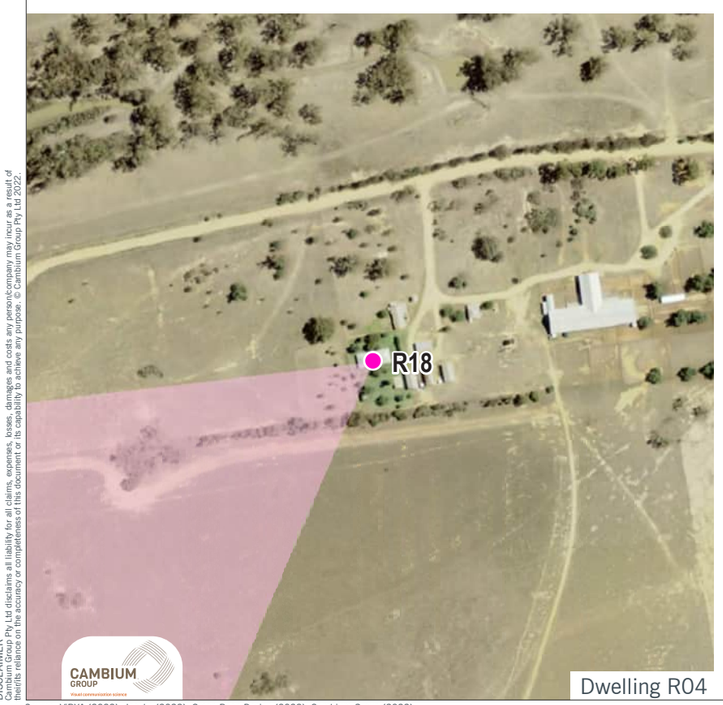
Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B9a

Dwelling R18 wireframe

GBD Landscape architecture





Dwelling R04

Non associated residential dwelling

60 degree sector with wind turbine within 8km

Wireframe diagrams are modelled with ground contours and do not illustrate the location, height or extent of existing vegetation, such as trees that may filter/screen views from dwellings or their immediate curtilage toward wind turbines.

Existing vegetation, visible in the aerial photo dwelling location image, would likely filter/ screen views toward a significant number of wind turbines illustrated in the wireframe diagram.

Wind turbines within background views from the dwelling (in excess of 8km) would potentially be screened by existing vegetation at around 2m to 3m in height between 10m to 20m distance from the dwelling, as well as taller vegetation further from the dwelling.

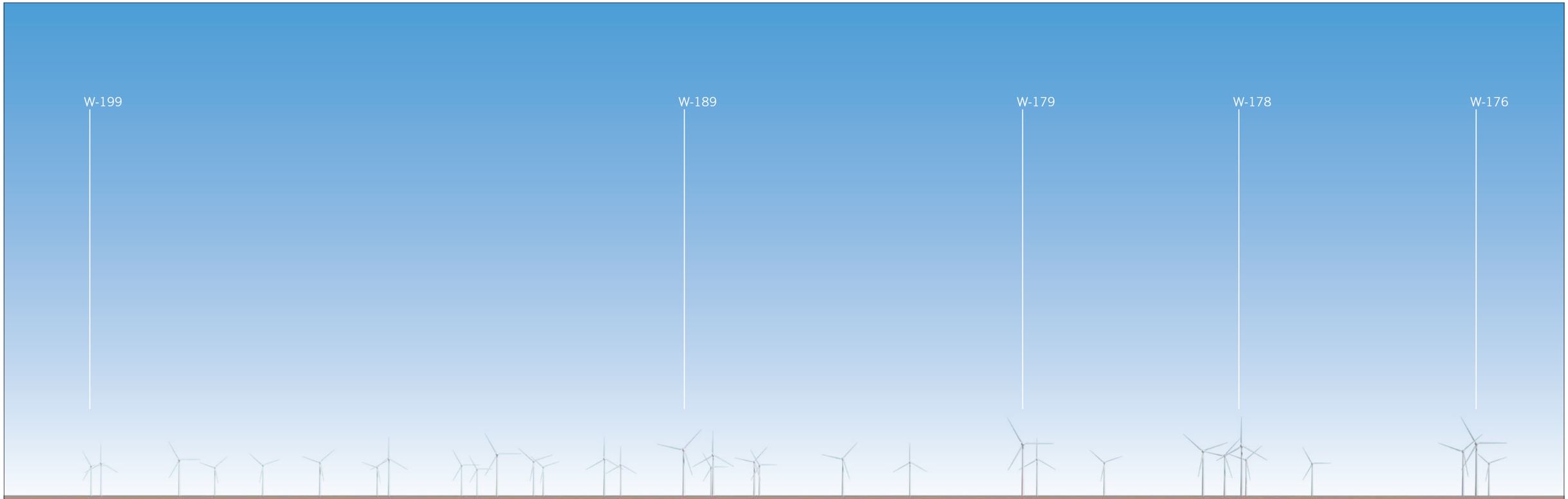
Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R18	Virtual	50mm	180^0	111.5mAHD	E388197m, N6108279m	GDA94	MGA94	55	7.2km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

Figure B9b

Dwelling R18 wireframe detail

GBD Landscape architecture



Location	Camera	Focal length	Horizontal field of view	Camera RL	Camera coordinates	Geodetic datum	Projection	Zone	Distance to nearest wind turbine
R18	Virtual	50mm	40^0	111.5mAHD	E388197m, N6108279m	GDA94	MGA94	55	7.2km (W-176)

Source: ViRYA (2022), Jacobs (2022), Green Bean Design (2022), Cambium Group (2022).

GBD
Landscape architecture

Green Bean Design Pty Ltd (GBD) is a highly experienced landscape architectural consultancy specialising in landscape and visual impact assessment. Established in 2006 as an independent consultancy, GBD provide professional advice to a range of commercial and government clients involved in large infrastructure project and policy development.

GBD Director Andrew Homewood is a Registered Landscape Architect, member of the Australian Institute of Landscape Architects and the Environmental Institute of Australia and New Zealand. Andrew has over 30 years' continuous employment in landscape consultancy and has completed numerous landscape and visual impact assessments for a range of state significant developments including wind energy, solar, mining, industrial and transport developments.

GBD has been commissioned for large scale renewable energy projects across New South Wales, Victoria, South Australia, Queensland and Tasmania.

GBD has been engaged as a peer reviewer of renewable energy landscape and visual impact assessments in Victoria and New South Wales.

CONTACT
Green Bean Design Pty Ltd
Andrew Homewood
0430 599 995
GreenBeanDesign@outlook.com

PO Box 3178 Austral, NSW 2179