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Moreton Hill Wind Farm

Preliminary Landscape and Visual Impact Assessment

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Preliminary Landscape and Visual Impact Assessment

Prepared for
MHWF Nominees Pty Ltd

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I

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Executive Summary

Moir Landscape Architecture (Moir LA) have been commissioned by MHWF Nominees Pty Ltd (the Applicant) to prepare a Preliminary Landscape and Visual Impact Assessment (PLVIA) for the proposed Moreton Hill Wind Farm (the Project).

The Project is located in the Central Highlands region of western Victoria, within Golden Plains Shire and Corangamite Shire, approximately 35 km south-west of Ballarat. The nearest townships are Skipton and Linton, approximately 5 km to the west and east of the Project site respectively. The wind farm site is bisected by the Corangamite and Golden Plains local government area (LGA) boundaries. This PLVIA relates to the installation, operation, maintenance and decommissioning of up to 62 Wind Turbine Generators (WTGs) of a maximum tip height of 252 metres.

In addition to the wind turbines, ancillary infrastructure including access tracks, road upgrades, underground transmission lines, substations, operations and maintenance facility and grid connection to the existing 220 kV transmission line have been assessed in this PLVIA.

A preliminary Community Engagement Plan has been prepared by MHWF Nominees Pty Ltd to outline the proposed communication and engagement activities and directions for consulting and involving the community at the detailed design stage.

Relevant literature and best practice guidelines relating to visual impact assessment have been considered to formulate a quantitative study method. Moir LA's previous experience undertaking Landscape and Visual Impact Assessments on large scale infrastructure projects has also been applied in the Study Method.

The PLVIA includes an overview of the relevant policies, comprehensive assessment of the existing landscape character and preliminary assessment from public and private viewing locations.

The PLVIA also establishes that the Study Area extends up to a distance of 6 km based on the limitations presented by vertical field of view angle and the distance between receptors and the nearest turbine. A preliminary assessment of public and private receptors within 6 km of the nearest turbine has, therefore, been included in this PLVIA.

Field work was undertaken by Moir LA to assess the existing landscape character with the purpose of preparing a baseline character context which the proposals impacts could be measured against. The assessment found that the landscape character of the region is typical of the Western Volcanic Plains and The Uplands, which is defined by cleared agricultural land predominately utilised for grazing with areas of remnant vegetation. The study area was categorised into six (6) Landscape Character Units (LCUs).

It was found that, although the landscape is predominately flat to gently undulating and cleared in most areas, landscape features which form a part of the overall existing character assist in reducing the potential for viewing the Project. These include areas with roadside vegetation, windbreak planting around dwellings and vegetation associated with creek lines and modified plantations.

A total of 25 public viewpoint locations were selected to assess the potential visual impacts from varying distances, landscape character units and viewing directions. A quantitative methodology was applied to assess the visual impact from each of these locations which found:

- 12 public viewpoint locations were assessed as having a Low visual impact rating.
- Six (6) public viewpoint locations were assessed as having a Moderate-Low visual impact rating.
- Six (6) public viewpoint locations were assessed as having a Moderate visual impact rating.
- One (1) public viewpoint location was assessed as having a High-Moderate visual impact rating.

A desktop assessment of non-involved dwellings within 6 km found the majority of dwellings are likely to have limited views to the Project due to existing intervening dense wind break vegetation.

A preliminary assessment of the associated infrastructure such as transmission lines, substation and BESS proposed for the Project has also been included in the PLVIA.

Practical and feasible mitigation principles have been proposed for residences and roadsides. The proposed mitigation measures would assist in reducing potential visual impacts on majority of the non-involved dwellings. Mitigation measures in keeping with the existing character include screen and supplementary plantings that blend with the surrounding vegetation character.

01
Introduction

1.0 Introduction

1.1 Introduction

Moir Landscape Architecture Pty Ltd (Moir LA) have been commissioned by MHWF Nominees Pty Ltd (the Applicant) to prepare a Preliminary Landscape and Visual Impact Assessment (PLVIA) for the proposed Moreton Hill Wind Farm (referred to hereafter as 'the Project').

The Project will include up to 62 turbines, each with a generation capacity of approximately 6.8 MW, with ancillary infrastructure.

1.2 Purpose of this Report

The purpose of this Preliminary Landscape and Visual Impact Assessment (PLVIA) report is to accompany a referral under the *Environment Effects Act 1978* (EEA). The PLVIA has been prepared based on the following:

- Ministerial guidelines for assessment of environmental effects under the EEA;
- Referral of a project for a decision on the need for assessment under the EEA - Referral Form; and
- Planning Guidelines for development of Wind Energy Facilities in Victoria, The State of Victoria Department of Transport and Planning (DTP), revised September 2023 (DTP, 2023).

The 'Referral Form' outlines the objectives and key considerations for the PLVIA report. These include an assessment of the Project in relation to the following:

- Surrounding significant landscape areas including land form, vegetation types and coverage, water features, any other notable features and current land use;
- The locations of nearby dwellings, townships, recreation areas, adjoining conservation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Identification of key views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting;
- Land reserved under National Parks Act 1975 and locations of State/Regional Significance value;
- Assessment of the visual impact of the development as it relates to the number, height, scale, spacing, colour and surface reflectivity of the wind turbines and aviation obstacle lighting;
- Removal or planting of vegetation;
- Location and scale of other buildings and works including transmission lines and associated access roads;
- Proximity to an existing/proposed wind energy facility, and the cumulative visual effects; and
- Potential for mitigation of proposed effects.

1.3 Assessment Requirements

This PVIA is based on the guidelines set by the Planning Guidelines for development of Wind Energy Facilities in Victoria (The Guidelines) (DTP, 2023).

The objectives of the Guidelines are to set out:

- A framework for a consistent and balanced approach to the assessment of wind energy projects across the state;
- A set of consistent performance standards to inform the assessment and operation of a wind energy facility project;
- Guidance for conformity with permit application requirements;
- Guidance as to locations in the state that are not appropriate to locate wind energy facilities; and
- Provide a framework to ensure proposals for wind energy facilities are thoroughly assessed, including where necessary the need for an Environmental Effects Statement (EES).

The landscape and visual impact assessment is broken into two main stages:

Stage 1: A preliminary assessment to understand existing landscape and visual character that would inform the wind farm design process and assist the Minister of Planning in assessing the need for EES.

Stage 2: A detailed assessment as part of the planning and approvals process following the determination of the need for an EES.

This report relates to **Stage 1: preliminary visual impact assessment** phase. The purpose the PLVIA is to address the considerations outlined in **1.2** sufficient to assist the Minister for Planning's assessment as to whether an EES is required.

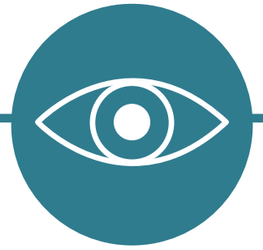
1.4 Report Structure

The flow chart on the following page provides a high level overview of the PLVIA process utilised to undertake the assessment. **Table 1** provides an outline of the report structure, a brief overview of the objectives of the Referral Form and a summary of how these have been addressed in the PLVIA.

The Project methodology is derived from Moir LA's experience and current best practice in landscape and visual impact assessment. Detailed methodologies for each part of the assessment have been included in the relevant chapters of the report.

Project Overview

Provide an overview of the aspects of the Project and the parameters against which the assessment is based.



Define the Visual Catchment

Determine the visual catchment through the use of desktop analysis including GIS mapping to determine the extent of visibility and identify areas upon which to undertake detailed assessment.

Policy Considerations

Overview of the policy considerations.

Public Viewpoint Analysis

Undertake assessments from key viewing locations identified within the 'visual catchment' to determine the impact of the Project. This includes an assessment from public viewing locations.

Photomontage and Wireframe Diagrams

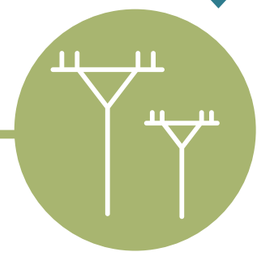
Prepare preliminary photomontages and wireframe diagrams for key public viewing locations identified within the 'visual catchment' to graphically represent potential views of the Project.

Dwelling Assessments

Assessment of the potential visual impact on nearby dwellings.

Cumulative Impact Assessment

Assessment of the cumulative impact resulting from surrounding wind farm projects.



Other Considerations

Assessment of other aspects which have the potential to contribute to the visual impact. This includes an assessment of associated infrastructure.

Mitigation Recommendations

Preliminary recommendations for reducing the identified impacts.

Summary and Findings

Summary of the findings of the report and next steps for assessment in approvals phase.

Table 1: Overview of Report Structure

02

Project Overview

2.0 Project Overview

2.1 Regional Context

The Project is located south of the Glenelg Highway and along the Rokewood - Skipton Road within the Corangamite Local Government Area (LGA) and Golden Plains LGA. It is situated approximately 5 km east of Skipton and 5 km west of Linton township. The Project can be accessed via Rokewood-Skipton Road and the Glenelg Highway (refer to **Figure 1**).

The Project is located within Victoria's Western Victoria Renewable Energy Zone (REZ) which is generally identified around the Western Victorian region near Ballarat. The flat, planar topography and minimal obtrusive elements across this landscape allow efficient and optimal harvest of wind energy. The Project is therefore strategically located in a broad area identified as suitable for renewable energy project.

Preliminary wind studies undertaken by the MHWF Nominees Pty Ltd have guided the development of the preliminary turbine layout for the Project as shown in **Figure 3** and a 14 km long 220 kV underground transmission line connecting the Project from the on-site substation into the electricity network at Berrybank Terminal Station.

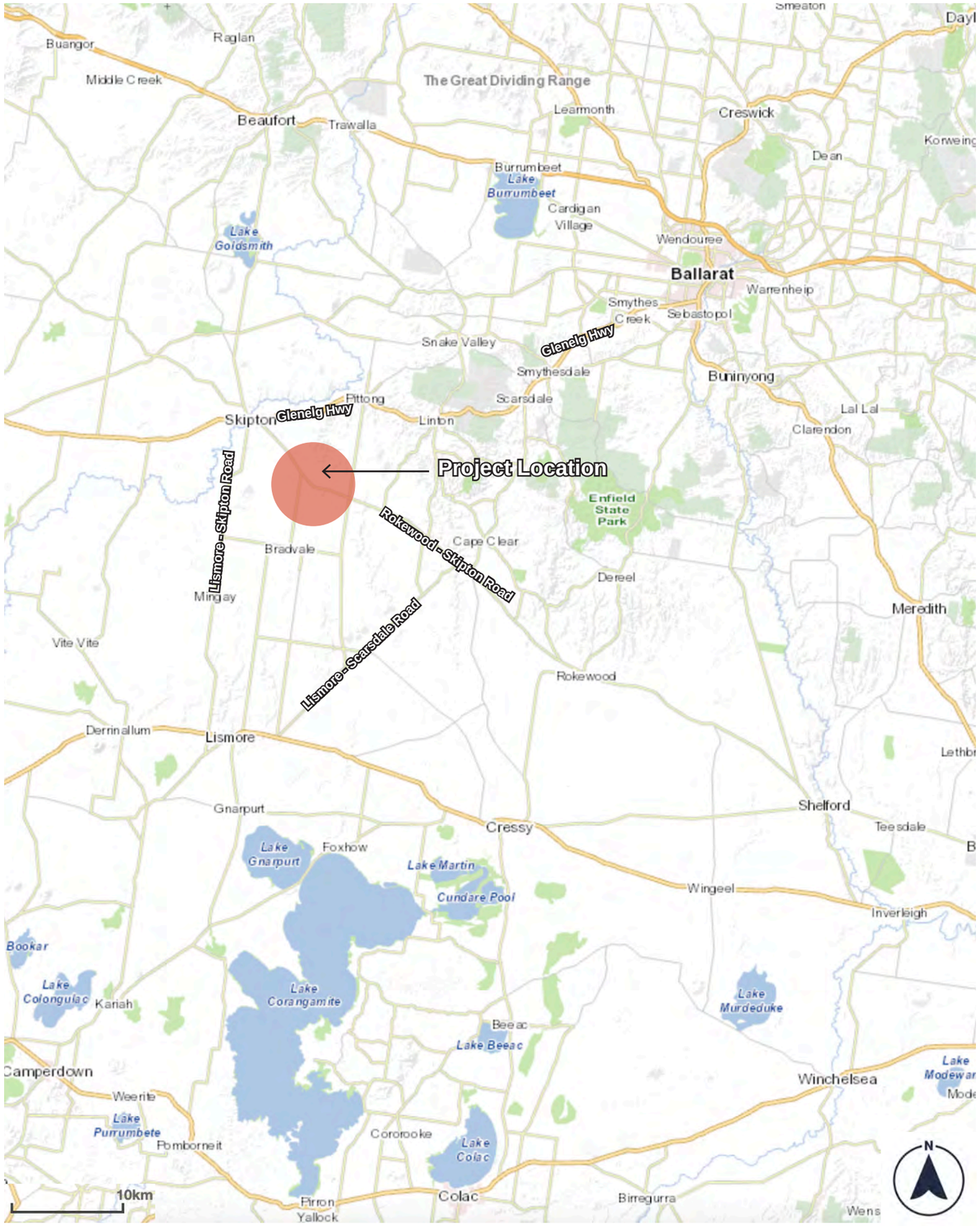


Figure 1: The Project Overview (Source: VicPlan 2023)

2.2 The Project Site and Study Area

The Project is located on private land holdings comprising farmlands and homestead areas. For the purposes of this report, the area covered by the Project boundary is referred to as the 'Project Site' and the overall area that this study encompasses (areas that fall within a 6 km radius from the site centre) is referred to as 'Study Area'. Most of the Project Site has been cleared of native vegetation to support farming although scattered trees and tracts of dense windbreak vegetation are common within and around the Project (see **Figure 2**). The Project Site ranges from between 200 m and 300 m above sea level with a gently undulating topography that is consistent with the character of this region. Several ephemeral creeks dot the landscape in the Project Site's surrounds. Farming is the dominant land use of the study area with land utilised for livestock grazing and cropping.

Figure 2: Birds Eye View of the Project Site (Source: Google Earth 2022)

2.3 The Project

The Project will deliver much needed renewable energy to the region. It will support the reduction of carbon emissions and assist Australia achieve its target for net-zero emissions by 2050. The proposal will comprise up to 62 wind turbines providing a total generation capacity of approximately 421 MW. Refer to **Figure 3**.

The Project comprises the following:

- Up to 62 wind turbines, each with a generation capacity of 6.8 MW and a maximum overall tip height of 252 m.
- Hardstands at the base of each turbine.
- Underground and overhead reticulation cabling between turbines.
- Onsite electrical substation.
- A 220 kV underground transmission line connecting the Project from the onsite substation into the electricity network at Berrybank Terminal Station.
- Battery Energy Storge System (BESS) with a storage capacity of up to 150 MW and associated water storage tanks.
- 45,000 lt tanks at main site entrance locations or as recommended by the CFA/Fire impact assessment.
- Internal site access tracks.
- Up to four (4) permanent meteorological monitoring masts (160 m high).
- Operations and maintenance facilities.
- Other permanent ancillary works, including road upgrades.

The Project also requires temporary infrastructure including two construction compounds, temporary laydown areas and two concrete batching plants.

The Project

Moreton Hill Wind Farm

LEGEND

- Project Area
- Proposed 252 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Council owned buildings
- 6,000 m from nearest turbine
- LGA boundary
- Roads
- Rivers / Creeks
- Proposed Transmission line connection to Berrybank Terminal Station
- Existing 220 kV transmission line

N

0 2 4 6 8 10km

Figure 3: The Project (Map Source: VicPlan 2023)

2.4 Wind Turbine Design

The proposed turbine parameters used for the assessment in this report are based on the most conservative scenario for the scale of the turbine that may be installed. The specifications are as follows:

- A generating capacity of approximately 6.8 MW;
- a 4-7 part tubular steel tower holding the nacelle;
- three blades mounted to a rotor hub in front of the nacelle which sits on the top of a tubular steel tower, with a combined height of blade and tower limited to a maximum tip height of 252 m AGL;
- a gearbox and generator assembly housed in a nacelle; and
- adjacent hardstands for use as crane pads and assembly and laydown areas.

Table 2 provides an overview of dimensions of the turbine components that have been used for this assessment. To best represent a worst case scenario, the maximum hub height of 166 metres has been used for modelling and visualisation purposes in this report. **Figure 4** illustrates the turbine parameters utilised for this report. **Image 1** shows the appearance of a typical wind turbine.

Wind Turbine Components		
Project Component	**Dimensions used in LVIA:**	**Quantity**
Uppermost Tip	252 metres AGL	62 (max)
Hub height	166 metres	
Rotor diameter	172 metres	

Table 2: Wind Turbine Parameters for Visual Assessment

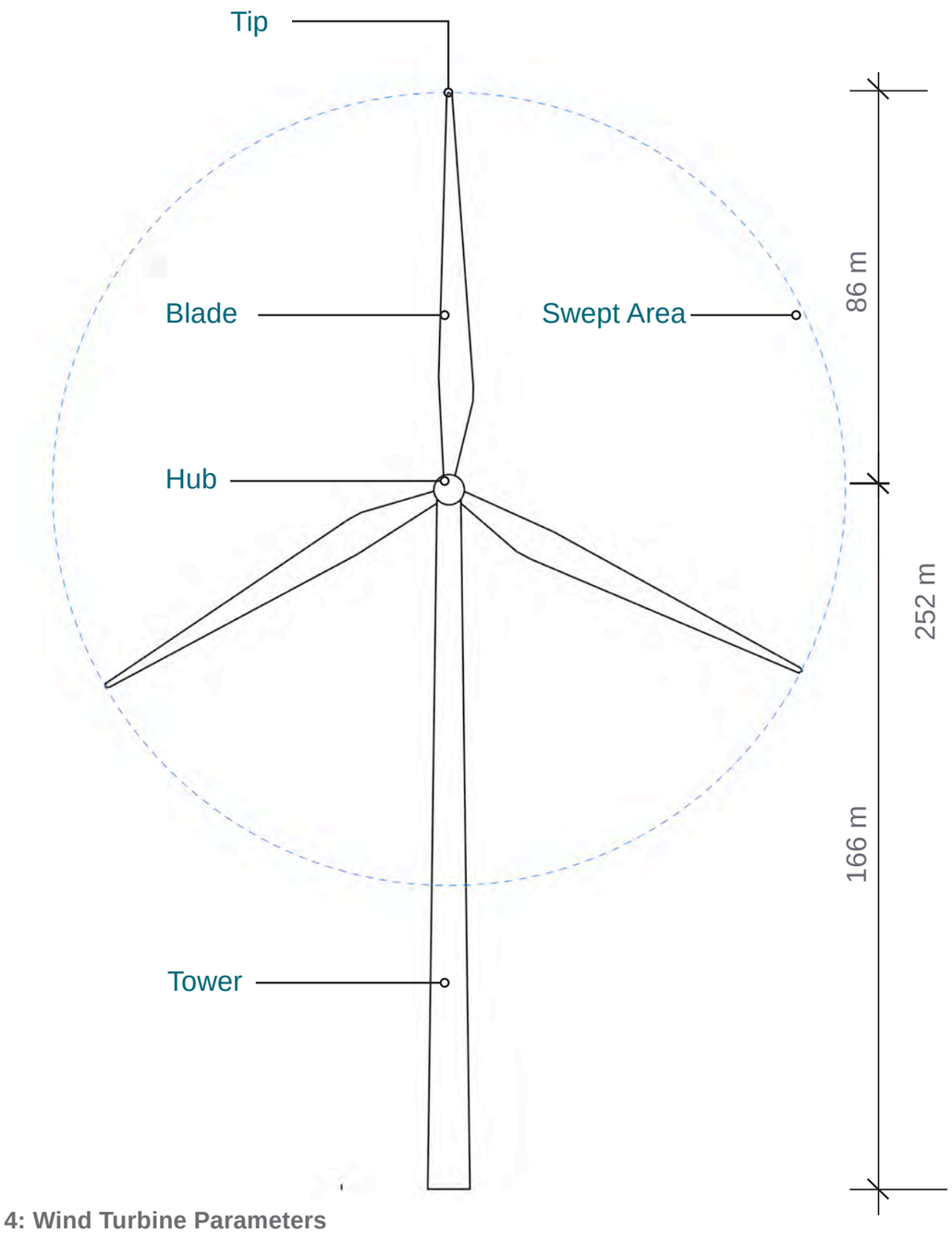


Figure 4: Wind Turbine Parameters

Image 1 Typical Wind Turbine

Image 2 Typical HV power line with poles

Image 3 Typical LV Power Line

Image 4 Typical Operations & Maintenance Facility

Image 5 Typical Substation

03

Defining the Visual Catchment

3.0 Visual Catchment

3.1 Defining the Visual Catchment

The visual catchment of the Project has been defined based on the parameters of the accepted extents human vision which include vertical field of view (refer to **Section 3.1.1**). In order to facilitate objective assessment of visibility, **Section 3.1.2** provides an outline on the potential visual prominence of the Project in relation to its distance from a receptor. The extent of the Study Area is, therefore, determined by the distance within which the proposed 252 m high turbines have the potential to be a significant object in the view (refer to **Section 3.1.3**).

3.1.1 Viewshed Calculation

Distance zones have been calculated using the parameters of the human eye and are based on the typical line of sight for a person standing at ground level (Tilley and Henry Dreyfuss Associates, 1993 and Panero and Zelnik, 1979). Given the spatial arrangement and layout of the Project, the vertical field of view provides a basis for calculating the extent of the viewshed.

Figure 5 shows that generally, the vertical field of view for a person standing at ground level is between 10^0 - 15^0. The theoretical extent of the viewshed is considered to be a distance at which the tallest component of the Project would take up less than 5% or 0.5^0 of the general 10^0 field of view (Environmental Protection Department, 2018).

It should be noted that this methodology for calculation of the viewshed considers the viewer is in a static position.

With an overall height of up to 252 m, the distance at which a 252 m high turbine would comprise 5% (0.5°) of the vertical field of view is up to 28.8 km.

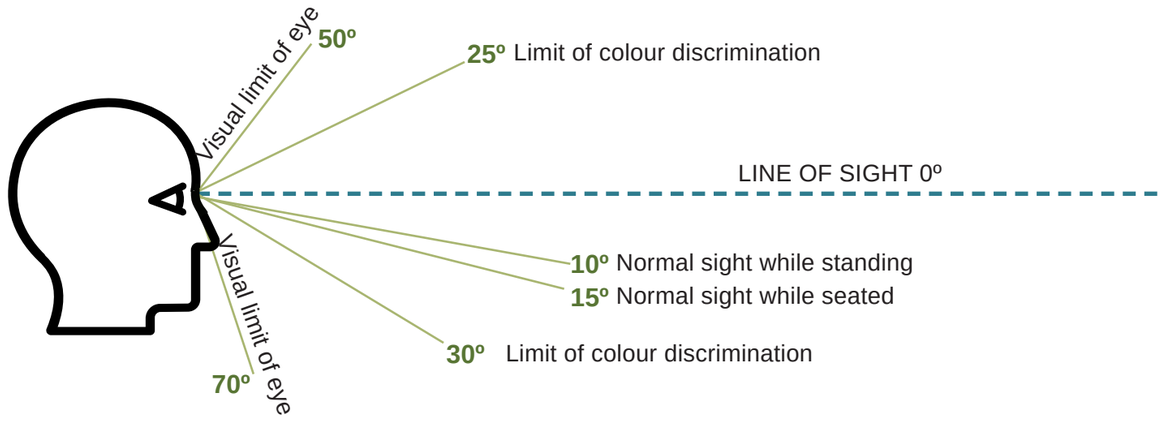


Figure 5: Human Eye Vertical Line of Sight (Source: Torrejon, Callaghan and Hagras, 2013)

3.1.2 Visual Prominence and Distance from the Wind Farm

The visual prominence of a turbine is not equal across an entire viewshed. The distance of a receptor to the closest turbine is a significant factor in determining the visual prominence of the Project. The *Draft National Wind Farm Guidelines* offer guidance based on previous studies that have been undertaken reviewing wind farm developments and the potential visual prominence based on the distance from the nearest wind turbine (EPHC, 2010). **Table 3** outlines the potential visual prominence of the Project in relation to the distance between receptors and the turbines.

Potential Visual Dominance	
Distance from wind turbine	**Potential visual dominance:**
> 12 km	**Visually Insignificant** A very small element in the landscape which is difficult to discern and is likely to be indiscernible under poor weather conditions. Rotor blade movement is likely to be visible on a clear day.
6 - 12 km	**Potentially Noticeable but will not dominate the landscape** The development may be noticeable. The degree that it intrudes on the view will increase as distance decreases.
2.5 - 6 km	**Potentially Noticeable and can dominate the landscape** The development is likely to be highly noticeable, although the degree of visual intrusion will depend on the landscape setting, intervening elements and the extent of visibility.
1 - 2.5 km	**Highly Visible and will usually dominate the landscape** The development will be highly visible.
< 1 km	**Will always be visually dominant in the landscape** The development will be highly visible.

Table 3: Potential Visual Dominance in relation to distance and viewshed (EPHC, 2010)

Assessment of the visual scale and prominence of turbines over a range of distances establishes whether objects are likely to be dominant, noticeable, discernible or insignificant in the viewshed. This has also been demonstrated in photomontages that have been prepared by Moir LA as part of landscape and visual impact assessments for wind farm developments of a similar scale. ***Images 6 - 9*** illustrate that visual prominence of turbines varies based on the distance between receptors and turbines.

The relative visual prominence of turbines is also based on the parameters of the human eye and the vertical angle of view. The theoretical dominance of an object in a view can be assumed. For example, if a receptor is located closer to a turbine, the turbine is likely to take up a greater vertical field of view for the receptor. **Figure 6** and **Table 4** demonstrate how increasing distance from a Project reduces the potential visual prominence and visibility of turbines based on vertical field of view.

3.0 Visual Catchment

Image 6 *Turbines located at a distance of 2 km are highly visible and are dominant in scale relative to elements such as fence posts and vegetation visible in the foreground (Source: Moir LA, 2022; NSW Major Projects website).*

Image 7 *Turbines located at a distance of 4 km are likely to diminish in scale relative to other elements such as dence posts and intervening vegetation in the foreground (Source: Moir LA, 2022; NSW Major Projects website).*

Image 8 *Turbines located at a distance of 6 km are likely to be appear smaller in scale relative to vegetation and structures in the foreground (Source: Moir LA, 2022; NSW Major Projects website).*

Image 9 *Turbines located at a distance beyond 6 km are likely to be visible. They appear smaller in scale relative to vegetation and structures in the foreground and middleground (Source: Moir LA, 2022; NSW Major Projects website).*

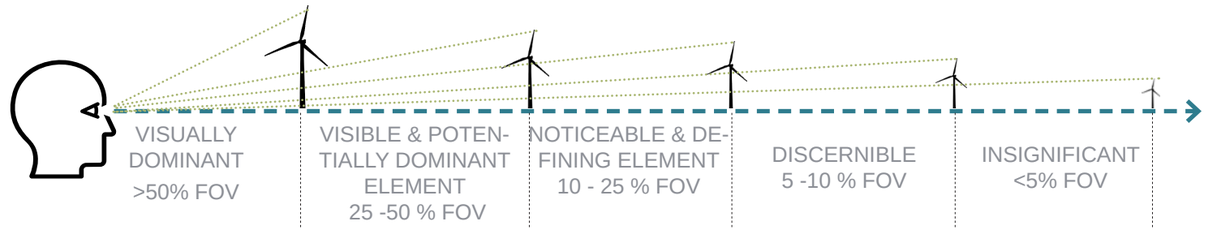


Figure 6: Vertical Field of View and potential visual dominance (Adapted from Landform Architects, 2022)

Vertical Field of View - Zone of Visibility		
Visual catchment (vertical angle of view)	**Distance from viewer to turbine for this Project**	**Potential visual dominance:**
0.5º (< 5% FOV)	**> 28.8 km**	**Insignificant** A small thin line in the landscape.
0.5 - 1.0º (5 - 10% FOV)	**14.4 - 28.8 km**	**Potentially Noticeable or Discernible** The Project may be noticeable. The degree that it intrudes on the view will be dependent on how well it integrates with the landscape setting.
1.0 - 2.5º (10 - 25% FOV)	**5.7 - 14.4 km**	**Noticeable and potentially a visible element in the landscape** The degree that it intrudes on the view will be dependent on sensitivity of the viewer and the landscape. This has been discussed further in **Section 6.3**.
2.5 - 5º (25 - 50% FOV)	**2.88 - 5.7 km**	**Visible and Potentially Dominant** The development will be visible, although the degree of visual intrusion will depend on the landscape setting, intervening elements and the extent of visibility. It is likely that beyond 6 km the turbines will diminish in scale relative to other elements in the fore and middleground such as fences, intervening structures such as sheds, vegetation, etc.
> 5º (> 50% FOV)	**<2.88 km**	**Will always be visually dominant** The Project will always be a dominant element in the landscape, unless screened by intervening vegetation or structures.

Table 4: Vertical Field of View and Zone of Visibility (Adapted from Landform Architects, 2022)

3.0 Visual Catchment

3.1.3 Zone of Visibility

A combination of the vertical field of view and visual prominence have helped identify the zone of visibility and visual catchment for the Project. **Table 4** provides an overview of the distances based on the vertical field of view occupied by a turbine height at 252 m. It states that generally, turbines are discernible but are not likely to dominate the existing visual setting when they are visible in 0.5^0 - 2.5^0 of the field of view, or in this case, if the receptor is located at a distance of 5.7 - 28.8 km from a turbine that has a height of 252 m.

The degree of intrusion of a development to a view depends on the way it integrates with the existing landscape setting. It is assumed that beyond a distance of 28.8 km the turbines would be a very minor element and visually insignificant in the landscape. At a distance of 5.7 - 28.8 km the Project may be discernible, but it will not be a dominant visual element in the landscape.

Considering the existing topographical conditions, the surrounding context and the visual prominence thresholds identified in the *Draft National Wind Farm Guidelines* (EPHC, 2010), this assessment has identified the Study Area to extend up to a distance of 6 km from the nearest turbine as a worst case scenario. Moir LA have, therefore, undertaken a Zone of Visual Influence up to a distance of 6 km to determine the extent of visibility of the Project.

Based on the thresholds for visual prominence identified in **Section 3.1.2**, the assessment identifies receptor locations within 2 km, 4 km and 6 km from the nearest turbine that are likely to view the turbines as noticeable, visible or dominant elements in the existing landscape setting.

3.2 Zone of Visual Influence

A Zone of Visual Influence (ZVI) has been prepared for the Project based on a nominal turbine height of 252 m this represents a worst case scenario (maximum tip height) to be pursued under the future Planning Application for the Project (refer to **Figure 7**).

The ZVI represents the area over which a development can theoretically be seen, and is based on a Digital Terrain Model (DTM). The ZVI presents a bare ground scenario - ie. a landscape without screening, structures or vegetation, and is usually presented on a base map. It is also referred to as a zone of theoretical visibility (The Landscape Institute and the Institute of Environmental Management and Assessment, 2002).

The ZVI diagram has been determined through the use of digital topographic information and 3D modelling software *WindPro*. The ZVI has been assessed to approximately 8 km from the outer extent of the Project. Although it is possible for the development to be visible from a location further than 8 km away, it is generally accepted that beyond this distance, the visibility is generally diminished (refer to **Section 3.1**).

3.3 Summary of Zone of Visual Influence

The ZVI is a preliminary assessment tool utilised to determine areas of land from which the Project has potential visibility (based on an assessment of topography alone). Due to the flat topography of the Study Area, the ZVI indicates the Project is likely to be visible in its entirety from most land within proximity to the Project.

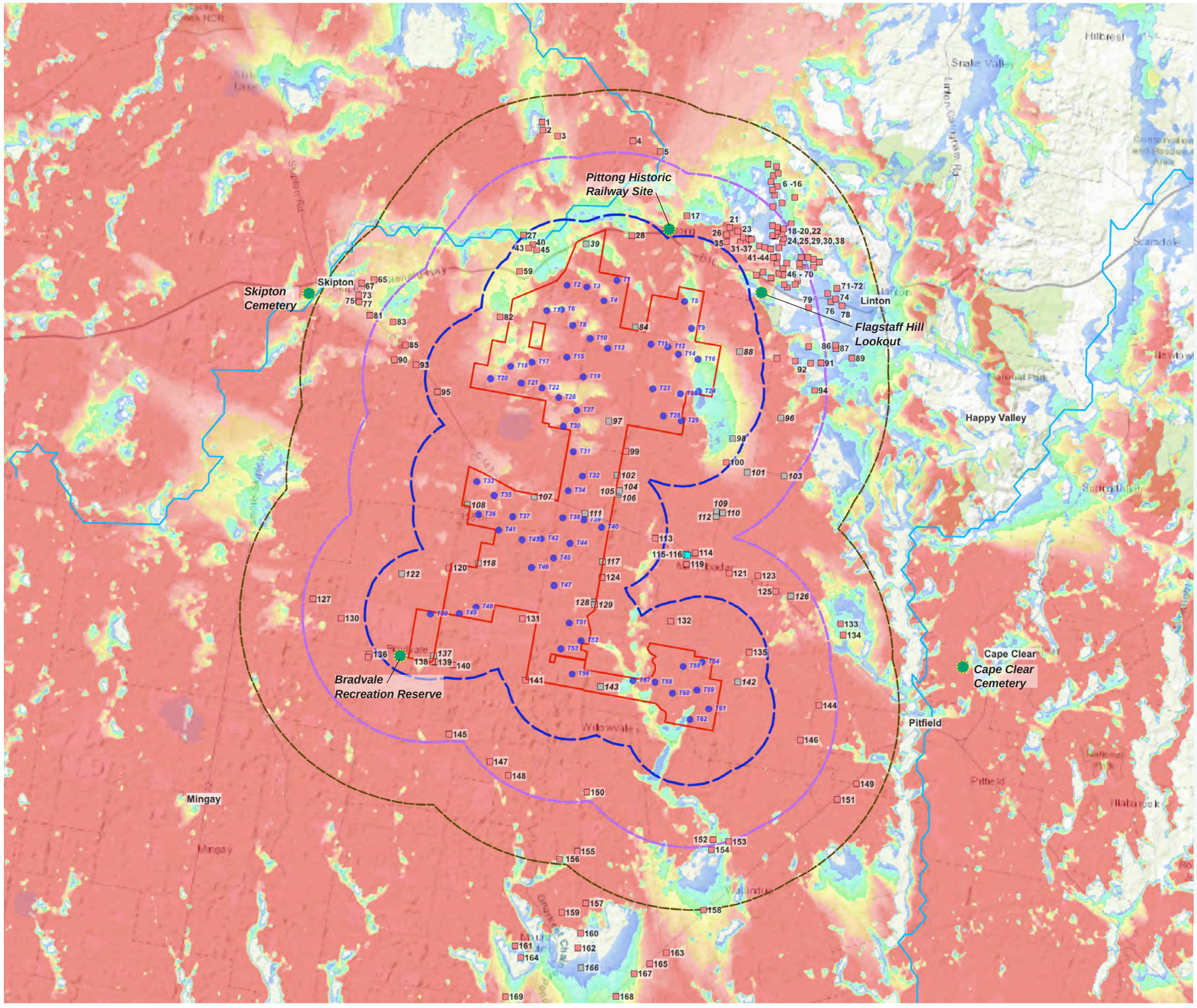
- Areas of land in excess of 6 km have been identified as having views to the Project screened by topography. These areas include Linton, Pitfield and Cape Clear which are located to the east and south east of the Study Area and Wallinduc to the south.
- Due to the flat topography of the area the Project may be visible from areas to the north west, west, south west and south of the Project Site.
- Steep undulating topography associated with the Linton / Nawnight - Widwid State Forest and Scarsdale Plantations to the north east of the turbines may conceal some views of the Project from towns such as Happy Valley and Snake Valley.
- Views from the outskirts of Skipton may be available. Undulating topography and existing tree cover are likely to limit views from many parts of Skipton township.
- Views toward the Project may be available for some clusters of dwellings located off the Glenelg Highway to the north west of the Project. Topography is likely to contain views from some dwellings located approximately 3 km from the Project Site.
- A number of dwellings are scattered within 6 km and surround the Project. Based on topography alone, the majority of dwellings will have views of the turbines.

Although the ZVI appears to indicate a high level of visibility, it is important to reiterate the ZVI does not take into account vegetation or built form that would intervene in views towards the project. Due to the flat topography, intervening vegetation will reduce visibility of the Project from surrounding areas particularly from Linton and Skipton.

Zone of Visual Influence

Blade Tip Height: 252 m

Moreton Hill Wind Farm



LEGEND

- Project Area
- Proposed 252 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Council owned buildings
- 2,000 m from nearest turbine
- 4,000 m from nearest turbine
- 6,000 m from nearest turbine
- Roads
- Key public viewpoint locations

NUMBER OF TURBINES VISIBLE
(Based on topography alone):

- 0
- 1 - <10
- 10 - <20
- 20 - <30
- 30 - <40
- 40 - <50
- 50 - <=62

Note:
The ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. a landscape without screening, structures or vegetation. As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note the ZVI is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.

N

0 2 4 6 8 10km

Figure 7: Zone of Visual Influence (Map Source: ESRI Imagery 2023)

04

Planning Context

4.0 Planning Context

4.1 Overview of Planning Context

In accordance with the requirements of the Department of Transport and Planning (DTP) [formerly known as DELWP], the Landscape and Visual Impact Assessment will be undertaken in two stages:

Stage 1: A preliminary assessment to understand existing landscape and visual character that would inform the wind farm design process and assist the Minister of Planning in assessing the need for Environment Effects Statement (EES);

Stage 2: A detailed assessment as part of the planning and approvals process following the determination of the need for an EES.

This report relates to **Stage 1: preliminary visual impact assessment** phase. The objective of the preliminary assessment is to inform the final design of the wind farm and ensure compliance with relevant legislation and policy. This section of the report provides an overview of the planning guidelines for consideration.

The Project is situated over two Local Government Areas (LGA) - Corangamite LGA and the Golden Plains LGA. Therefore for the purposes of this assessment, Clauses relating to development of wind energy facility within the Corangamite Planning Scheme (CPS) and the Golden Plains Planning Scheme (GPPS) have been discussed below.

4.1.1 Corangamite Planning Scheme 2023

With specific reference to the proposal of a wind energy facility in the Corangamite LGA, Clause 52.32 of the Corangamite Planning Scheme specifies that all land within 5 km of the high water mark of the coast is prohibited from wind energy facility development (Corangamite Council, 2023).

4.1.2 Golden Plains Planning Scheme 2023

With specific reference to the proposal of a wind energy facility in the Golden Plains LGA, Clause 52.32 of the Golden Plains Planning Scheme does not specify any prohibitions on land used to develop a wind energy facility (Golden Plains Council, 2023).

The following Section of the report provides an overview of the zoning designations and sensitive landscape overlays specific to Corangamite Shire Council and Golden Plains Shire Council (Refer to Sections 4.2 - 4.4).

4.1.3 Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria

The *Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria* help to inform planning decisions about proposals and set out:

- a framework to provide a consistent and balanced approach to the assessment of wind energy facilities;
- operational performance standards to inform the assessment and operation of wind energy facilities; and
- guidance as to how planning permit application requirements might be met.

4.2 Sensitive Land Zoning Designations

4.2.1 FZ - Farming Zone

The Project Site and surrounding land is zoned FZ - Farming Zone under the CPS and GPPS. The objectives of the Farming Zone relevant to landscape and visual impact within the CPS and the GPPS are:

- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture*.

4.2.2 RLZ - Rural Living Zone

Semi-rural residences on the outskirts of Linton (within Golden Plains LGA) located approximately 5.5km east of the Project, fall in this category of zoning. No areas of RLZ were identified within the Corangamite LGA in the Study Area.

As outlined in the GPPS the objective of this zone that relate to landscape and visual impact are:

- *To protect and enhance the natural resources, biodiversity and landscape and heritage values of the area.*
- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.*

4.2.3 GRZ - General Residential Zone and TZ - Township Zone

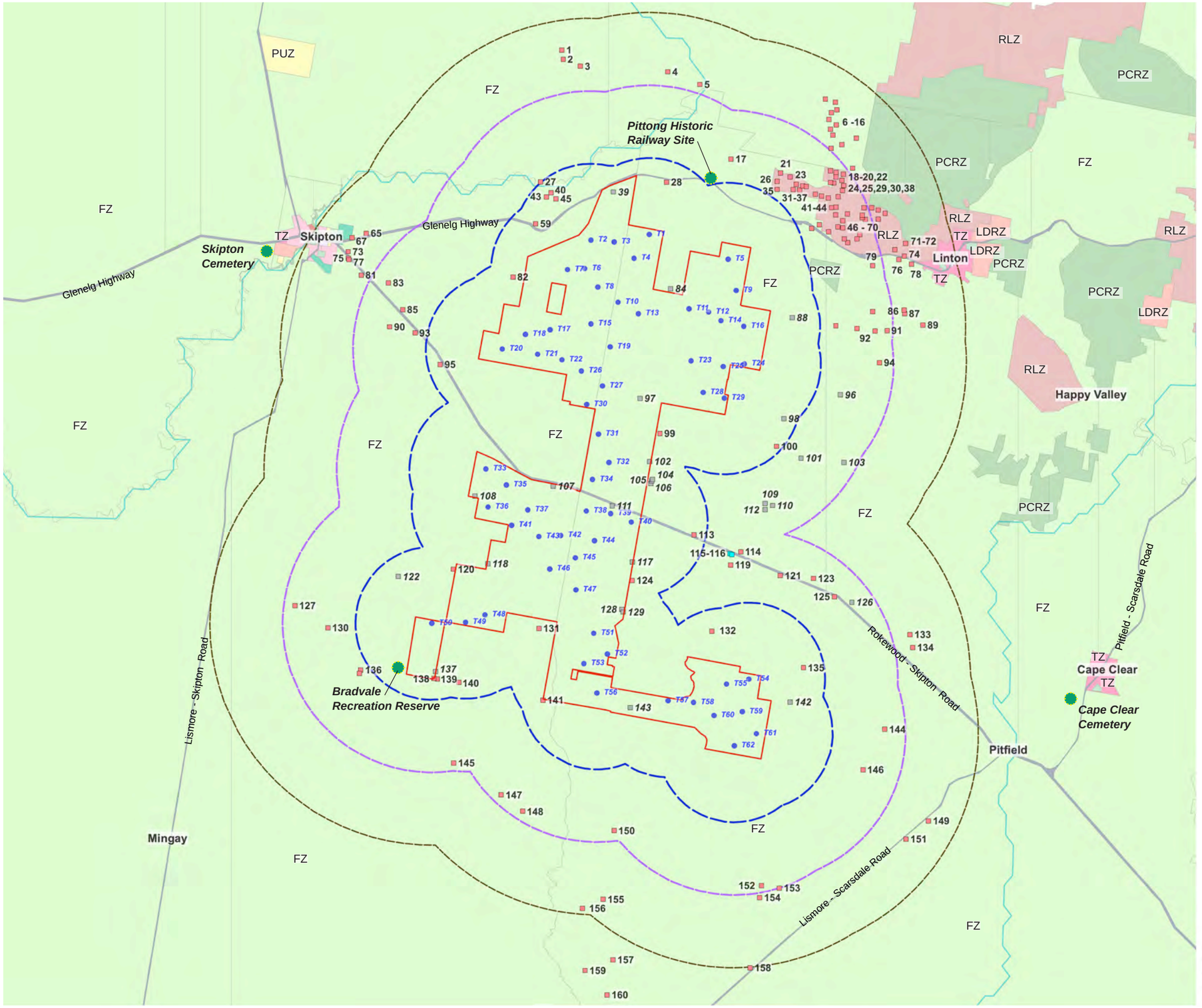
Other zoning designations within township areas include GRZ - General Residential Zone and TZ - Township Zone. They are located within and around Skipton, Linton and Cape Clear. Skipton is characterized by bluestone buildings and a unique historic character with a regional country charm. These zoning designations aim to "*encourage development that respects the neighbourhood character of the area*" and *"provide for residential development and a range of commercial, industrial and other uses in small towns*".

4.2.4 Other Zones in vicinity

Other land zoning designations within the Study Area are PCRZ - Public Conservation and Resource Zone, LDRZ - Low Density Residential Zone, PUZ - Public Use Zone, and TZ2 - Transport Zone. Most of these zoning designations are associated with Skipton and Linton. They aim to provide for public land uses and utilities.

Land Zone Designations

Moreton Hill Wind Farm



LEGEND

- Project Area
- Proposed 252 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Council owned buildings
- 2,000 m from nearest turbine
- 4,000 m from nearest turbine
- 6,000 m from nearest turbine
- Roads
- Key public viewpoint locations
- FZ - Farming Zone
- PCRZ - Public Consevation and Resource zone
- PUZ - Public Use Zone
- RLZ - Rural Living Zone
- GRZ - General Residential Zone
- TZ - Township Zone
- LDRZ - Low Density Residential Zone
- RAZ - Rural Activity Zone
- TZ2 - Transport Zone

N

0 2 4 6 8km

Figure 8: Land Zoning Designations within the Study Area (Map Source: VicPlan 2023)

4.3 Sensitive Landscape Overlay Designations

The Project does not fall under any Significant Landscape Overlay as designated by the Victorian Planning Scheme. However, surrounding areas that have landscape, environmental and building overlays impose restrictions on built form and development. Certain land parcels within the Project Site have been applied with the Bushfire Management Overlay (BMO), Salinity Mangagement Overlay (SMO) and Vegetation Protection Overlay (VPO) (refer **Figure 9**).

4.3.1 ESO - Environmental Significance Overlay

Natural assets that are in proximity of the Project and have been assigned this overlay include the Mount Emu Creek frontage (located to the north of the Project Site) and an unnamed lake on the western side of the Project Site. The overlay ensures that all development is compatible with their environmental values. No turbines have been proposed within this overlay.

4.3.2 SLO - Significant Landscape Overlay

The overlay has been applied to the Mount Widderin area located to the west of the Project Site. Mount Widderin is a low lava dome with unique landscape characteristics (Victorian Resources Online 2023) that this policy seeks to conserve.

4.3.3 VPO - Vegetation Protection Overlay

Corridors of vegetation within and around the Project Site are protected under the VPO. The corridor plantation offers windbreak opportunities, landscape amenity and ecological habitat. The overlay has been applied to vegetation along Glenelg Highway between Linton and Pittong, along Rokewood-Skipton Road from Mannibadar running east from the Project, stretch of vegetation along Linton-Mannibadar Road and vegetation along Willovale Road to the south of the Project. Vegetation along the northern boundary of the Project along Glenelg Highway is also categorised under the VPO (see **Figure 9**).

4.3.4 DDO - Design and Development Overlay

This Overlay is applied to areas within Skipton and Linton where restrictions are applied on aspects such as density of residential development in order to restrict the growth of certain areas.

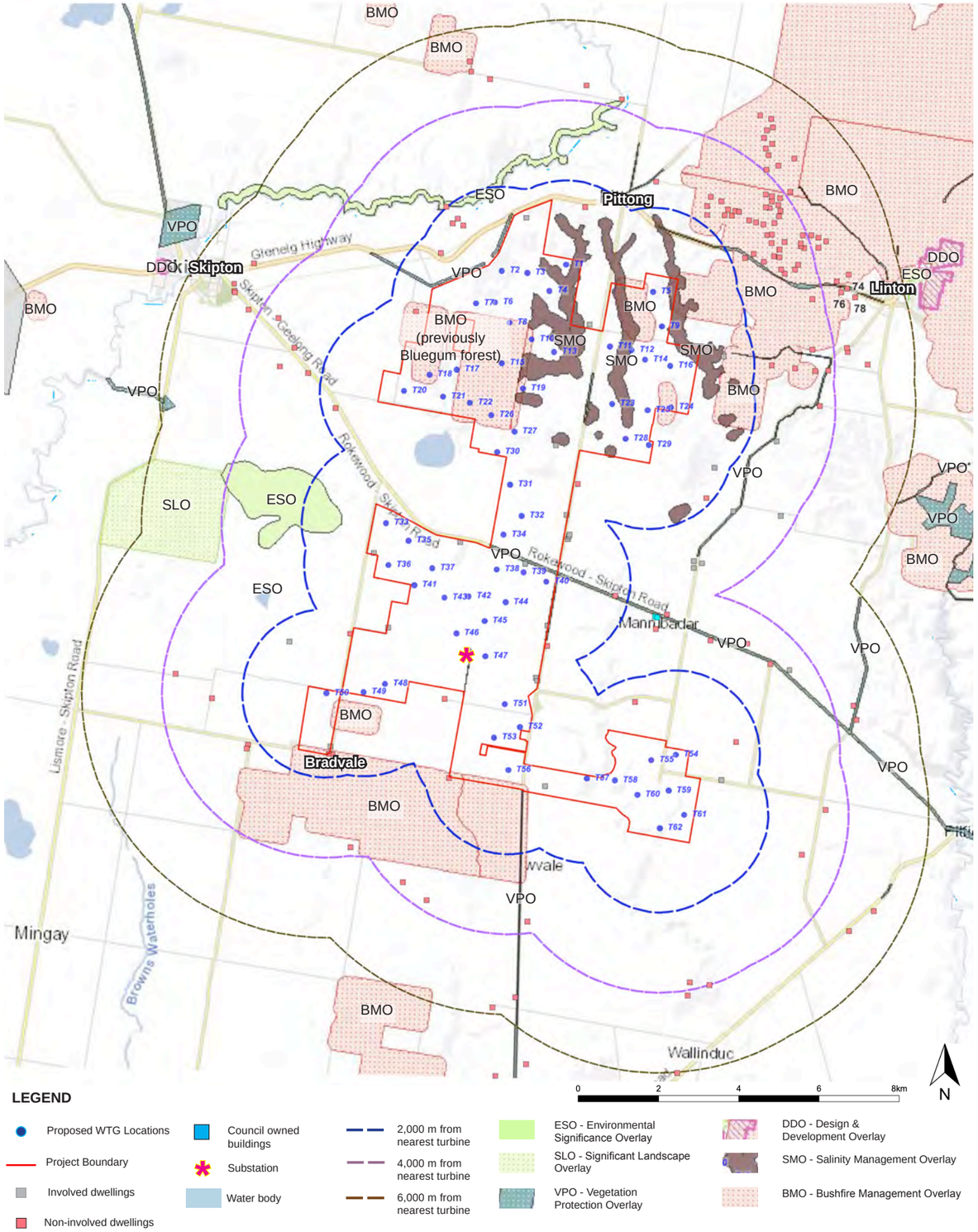


Figure 9: Landscape Overlay Designations within Study Area (Map Source: VicPlan 2023)

4.3.5 SMO - Salinity Management Overlay

This Overlay is applied to identify areas that are likely to experience accumulation of salt on the soil surface. This overlay was identified along Hoyles Creek and associated creeklines which flow within the Project Site (see **Figure 9**). No turbines are proposed within the land subjected to this overlay.

4.3.5 Bushfire Management Overlay and bushfire prone areas

Certain areas within the Project Site and areas to the west and south of the Project Site are subjected to the Bushfire Management Overlay (BMO) to help identify the hazards of bushfire within this region. Victorian Planning Maps also suggest that the entire area within and around the Project Site is prone to bushfire.

Majority of the Bluegum plantation that was located within the north western part of the Project Site was removed in 2016. Certain parcels of land in the north eastern part of the Project Site continue to hold remnant vegetation that is subjected to the BMO.

4.4 Sensitive Heritage Designations

The Project is located partly within the Corangamite LGA and the Golden Plains LGA. The Corangamite and the Golden Plains Planning Schemes seek to protect the Aboriginal cultural heritage. These Schemes provide for the protection and conservation of these areas. No areas under the Victorian Heritage Register are identified within the Study Area.

4.4.1 Areas with Aboriginal cultural heritage significance

Figure 10 shows areas of Aboriginal cultural sensitivity that are around or within the extents of the Project. Some of these areas can be identified as areas of high ecological significance. This includes creeklines, lakes and wetlands that drain the region. It includes Naringhil Creek, Brown's Waterholes, Mount Emu Creek and other lakes and creek beds.

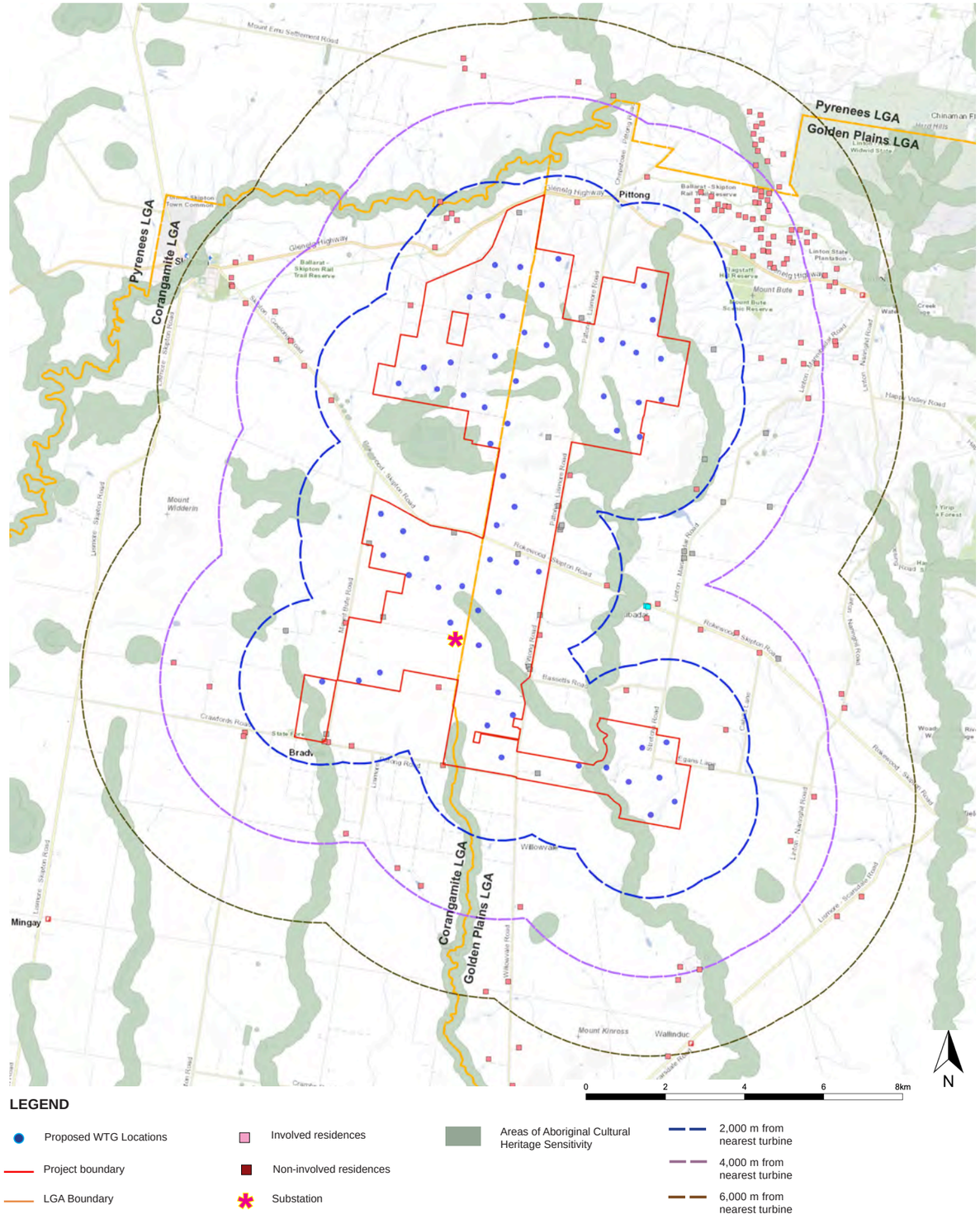


Figure 10: Landscape Heritage Overlays within Study Area (Map Source: VicPlan 2023)

05

Existing Landscape Character

5.0 Existing Landscape Character

5.1 Overview of Landscape Character Analysis

The purpose of the Landscape Character Analysis is to establish the existing landscape and visual conditions through descriptions, mapping and photographic representations. The study method for undertaking the Landscape Character Analysis has been established in accordance with the *Draft National Wind Farm Development Guidelines* and Australian Institute of Landscape Architects (AILA) Guidance Notes for Landscape and Visual Impact Assessment where relevant and in conjunction with previous experience on large scale wind energy projects.

Landscape Character Analysis inputs:	
Regional Landscape Character	
• *Description of the regional area of land in which the wind energy project is located including a description of the typical landscape character type.*	***Refer to Section 5.2 & 5.3***
Local Landscape Character	
• *Description of the local area within which the Project sits.*	***Refer to Section 5.4***
Landscape Character Unit Classification	
• *Landscape is categorised into Landscape Character Units (LCU) and Scenic Quality Ratings are applied to each LCU*.	***Refer to Section 5.6***
Landscape Features and Key Viewing Locations	
• *Identify areas of visual interest or quality that stand out visually in the landscape. Establish key viewing locations from which assessment is to be undertaken.*	***Refer to Section 5.5***
Viewpoint Inventory	
• *Undertake a viewpoint inventory from public and private locations and assess the potential visual impact of the Project.*	***Refer to Section 6.0***

Table 5: Overview of Landscape Character Analysis Process

5.2 South West Victoria Landscape Assessment Study

The *South West Victoria Landscape Assessment Study: Regional Overview Report* was prepared by the Victorian Government's Department of Planning and Community Development. The Department commissioned a landscape assessment of South West Victoria to better understand and assess the visual character and significance of the wide range of landscape types, this includes the volcanic plains and cones that dominate much of the area. The Western Volcanic Plain region extends between the Great Dividing Range in the north and the Grampians in the central west. The Uplands are primarily defined by topography stretching from the north of the The Western Volcanic Plain near the Grampians Ranges to edge of Bacchus Marsh to the east. The study is also used to inform planning scheme policies that assist in planning decision-making, and ensures that landscapes of importance are adequately protected and managed for the future. The Study Area is primarily defined by The Western Volcanic Plain and The Uplands (refer to **Figure 11**).

5.2.1 The Western Volcanic Plain

This Character Type is formed by a flat to undulating basaltic plain scattered with volcanic features including stony rises, old lava flows, numerous volcanic cones and old eruption points which together create a unique visual landscape. This is a place of big skies, long views with volcanic rises that punctuate the horizon. When the first European settlers arrived they found the land primed for agriculture as it contained very few trees. Shelterbelts of cypress and pine were planted to protect crops and livestock from the winds that sweep the plain and are now a defining characteristic of the Type (Department of Planning and Community Development).

The landscape associated with the Western Volcanic Plain within the Study Area has been extensively cleared for farming.

5.2.2 The Uplands

This diverse Character Type rises dramatically to the north of the flat volcanic plain, stretching from near the Grampians Ranges in the west to the edge of the study area at Bacchus Marsh in the east. Fingers of the Victorian Uplands weave with the adjacent Goldfields region along this northern edge to form a rugged landscape of undulating hills and fertile agricultural valleys. Granitic intrusions have formed steeply sloping peaks and ridges, some of which are carpeted in vegetation at higher elevations. Plateaus that are cut by deep river gorges create dramatic landscape features to the south. (Department of Planning and Community Development).

The landscape associated with The Uplands within the Study Area has been primarily cleared for farming, there are several large areas of public land including parks, public reserves and State Forests are present in the landscape. Significant vegetation types can be found within these areas with contrasting geology, vegetation and modified landscape.

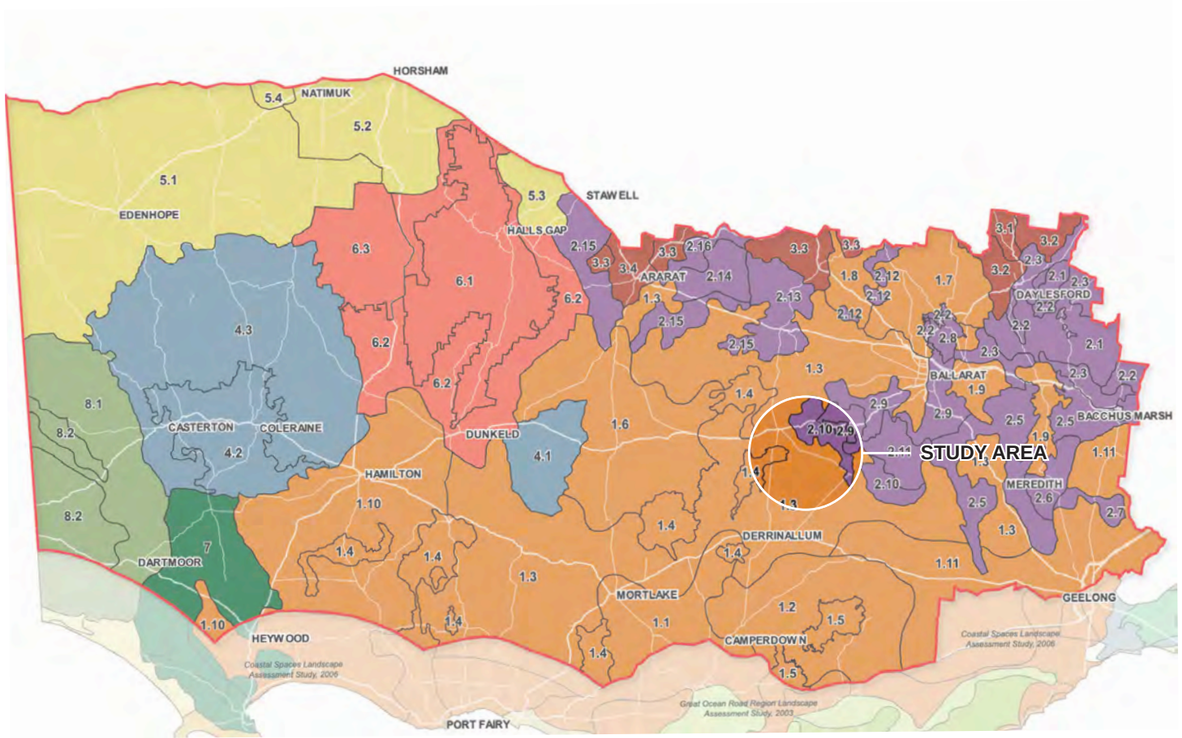


Figure 11: Landscape Types & Areas of South Western Victoria (Planisphere, 2013)

5.3 Significant Landscapes of South West Victoria

The *Significant Landscapes of South West Victoria* is another study that was conducted in 2012 to assess character and significance of landscapes throughout south west Victoria. Broad landscape areas were examined in detail and an assessment of their cultural landscape values was undertaken. These detailed assessments led to the designation of some landscapes as Significance Investigation Areas, Regionally Significant, and others of State Significance (or higher, though a rating of 'national' significance has not been attributed due to the scale/ context of the study, and the inability to justify such a rating through comparative analysis) (Planisphere, 2015).

Figure 12 shows the levels of significance attributed to the landscapes across South West Victoria, as well as the viewing locations from which regionally and state significant views are available.

Some turbines associated with the Project are is located within a significance investigation area.

Open, rolling pastures are deeply incised by the steepsided basalt gorge of the Woady Yalloak River, forming the Devils Kitchen.

The Project Site itself is largely farming land which has been highly modified by agricultural activities. The Project will not impact on the character of any landscapes that have been determined to be of regional or state significance.

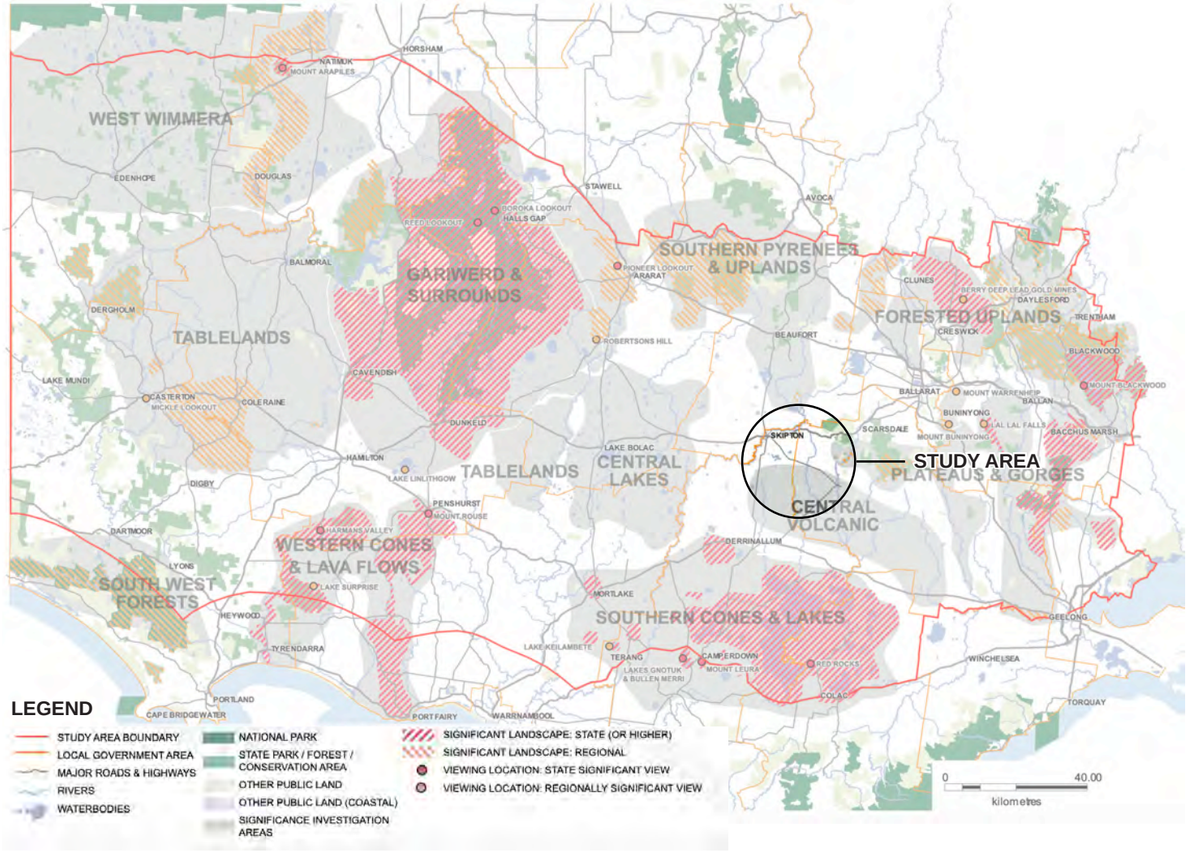


Figure 12: Significant Investigation Areas and Significant Landscapes and Views of South West Victoria
(Planisphere, 2013)

5.4 Existing Character of the Study Area

To establish a baseline for Landscape and Visual Impact Assessment it is essential to identify and map the landscape character types that exist within the Study Area. These character types are generally informed by the dominant visual elements that relate to land use, topography, vegetation and extent of modification (refer to **section 2.2**).

5.4.1 Towns, Villages and Localities

The Project is spread between the Corangamite Council LGA and the Golden Plains LGA. It is located approximately 5 km south east of Skipton and 5.5 km south west of Linton. Other settlements and localities that are located close to the Project include Pittong, Bradvale, Cape Clear and Mannibadar.

Skipton:

Skipton is the largest town located nearest to the Project Site. It is a historic town that was established initially as a pastoral run in 1839. The town offers several interesting sights, and is known for its regional country charm that is offered by the unique heritage it exhibits through the bluestone buildings and several recreational flora and fauna reserves. It lies in the Corangamite Shire LGA . A total of 602 people reside in Skipton (ABS, 2021) and most people engage in wool and grain production and sheep and cattle farming (Corangamite Shire Council 2023). Topography is generally undulating with a range of vegetation typologies defined by human intervention.

Linton:

Another important historic town located 5.5 km north west of the Project. It was established on the banks of Spingdallah Creek as a pastoral run company. It lies in the Golden Plains Shire LGA on Glenelg Highway and has a population of 423 people as recorded in 2021 (ABS, 2021). Visual and landscape character is generally filtered by vegetation surrounding the town.

Pittong, Mannibadar, Cape Clear and Bradvale:

Surrounding the Project are the rural localities of Pittong, Mannibadar, Cape Clear and Bradvale. These settlements were established as pastoral runs for expanding agricultural activity. The character is generally defined by modified land that supports agriculture and farming. Tracts of remnant and dense roadside vegetation are located within the extents of these localities.

Image 10 Character of Skipton's town centre *(Source: Google Street View)*

Image 11 Linton's town centre characteristic of a regional town. *(Source: Google Street View)*

Image 12 Skipton's The Woolshed Inn

Image 13 Typical character in and around Linton

Image 14 Typical character of Skipton.

5.4.2 Accessibility

Glenelg Highway (B160) connects Skipton and Linton to Ballarat to the east and Hamilton to the west and serves as an important conveyance route within the Western Plains region. This road corridor is a Declared Arterial Road Corridor (VicPlan, 2019). Smaller localities such as Bradvale, Mannibadar and Pittong are connected by moderate use roads such as Rokewood-Skipton Road, Pittong-Lismore Road, and Lismore-Skipton Road. Most dwellings within the Study Area are located along these road corridors. Typical character of these roads is defined by moderate to dense vegetation corridors that help filter views and act as windbreaks (See **Image 16**).

5.4.3 Surrounding wind farms

The Western Plains region of Victoria has been identified as suitable for the development of wind energy projects due to the frequency and intensity of prevailing winds. Existing wind farm projects that are in close proximity of the Project are:

- Stockyard Hill Wind Farm (Operating)
- Berrybank Wind Farm (Operating)
- Chepstowe Wind Farm (Operating)
- Golden Plains Wind Farm (Under construction).

Stockyard Hill Wind Farm consists of 149 approved wind turbines generates up to 532 MW of energy. The wind farm is currently operating and is located approximately 35 km west of Ballarat and is approximately 3 km north of the Project.

Chepstowe Wind Farm generates up to 6.15 MW of energy. The wind farm is currently operating and is located approximately 8 km north of the Project (Fezero Pty Ltd, 2020).

The Berrybank Stage 1 Wind Farm and Berrybank Stage 2 Wind Farm generates up to 180.6 MW (Stage 1), 109.2 MW (Stage 2) (GPG Naturgy, 2019). The wind farm is currently operating and is located approximately 16 km east of Lismore and is approximately 9.5 km south of the Project.

The Golden Plains Wind Farm will generate up to 1,330 MW of energy (WestWind Energy, 2022). The wind farm is currently under construction. It is located approximately 25 km east of Lismore and is approximately 10 km southeast of the Project.

The cumulative visual impacts of surrounding wind farms is likely to be experienced from some public locations within the Study Area and has been discussed in **Section 9.0** of this report .

Image 15 Typical character along Glenelg Highway, between Pittong and Skipton

Image 16 Typical character of low use roads (Rokewood-Skipton Road) that provide access to dwellings within and around the Study Area

Image 17 Views of Stockyard Hill Wind Farm (operational) located north east of Skipton

Image 18 Typical character of low use roads and view of the Stockyard Hill Wind Farm in the distance

5.5 Key Landscape Features

The following provides an overview of the key features identified within the Study Area and its surrounds which contribute to the visual character of the landscape (refer to **Figure 22**).

5.5.1 Landform, geology and soils

The Western Plains region of Victoria is characterised by large, windswept flat plains with gentle undulations. The area is categorised as Victorian Volcanic Plains IBRA Bioregion dominated by Cainozoic volcanic deposits that comprise of old eruption points, numerous volcanic cones, old lava flows to form an extensively flat to undulating basaltic plain with stony rises (DELWP, 2019b). Extinct volcanoes such as Mount Widderin form a distinct feature in the landscape set in an otherwise flat pastoral landscape modified extensively for agriculture. A number of quarries were established on these high points to mine volcanic scoria gravel.

Largely flat pastoral lands are fertile with rich, red volcanic soils that support agricultural activity such as animal grazing and cropping. The predominant character within and in the immediate surrounds of the Project is pastoral (refer to **Image 19**) extending for kilometres until disrupted by populated towns, volcanic features that punctuate the landscape.

5.5.2 Vegetation

The area falls within the Victorian Volcanic Plain Bioregion which is generally treeless and dominated by grasses or herbs such as *Microleana spp.* (Weeping Grass), *Themeda triandra* (Kangaroo Grass), *Acaena echinata* (Sheep's Burr), and *Schoenus apogon* (Common Bog-sedge) (DELWP 2019b). The land parcels are largely flat and are generally devoid of dense canopy cover. Most of the land has been cleared for agricultural activity which has led to the replacement of native grasslands with exotic pasture species and monocultural crops (Planisphere, 2013). Canopy cover of both exotic and native species is restricted to the windbreak plantations along rural residential lot boundaries and sparse corridor vegetation along main roads / highways.

Lakes and wetlands around the area support diverse aquatic species. The volcanic undulations are mostly bare with a few crops, grazing parcels and some shrubby vegetation.

5.5.3 Water form - creeks and lakes

The Volcanic Plains are drained by interspersed creeks. Of these, the most prominent creeks are Mundy Gully and Naringhil Creek. There are a number of other creek channels spread across the Study

Image 18 Typical character of within the Study Area

Image 19 Typical vegetation character around creeks and water ways. View of Naringhil Creek

Image 20 Typical vegetation character within the Study Area

Image 21 View of Mount Widderin located west of the Project

Area. This character is dominant within the extents of the Western Plains. Mount Emu Creek is located west of the Project. These creeks are very narrow and seasonal. Woady Yallock River is located east of the Project outside the Study Area.

5.5.4 Agricultural production

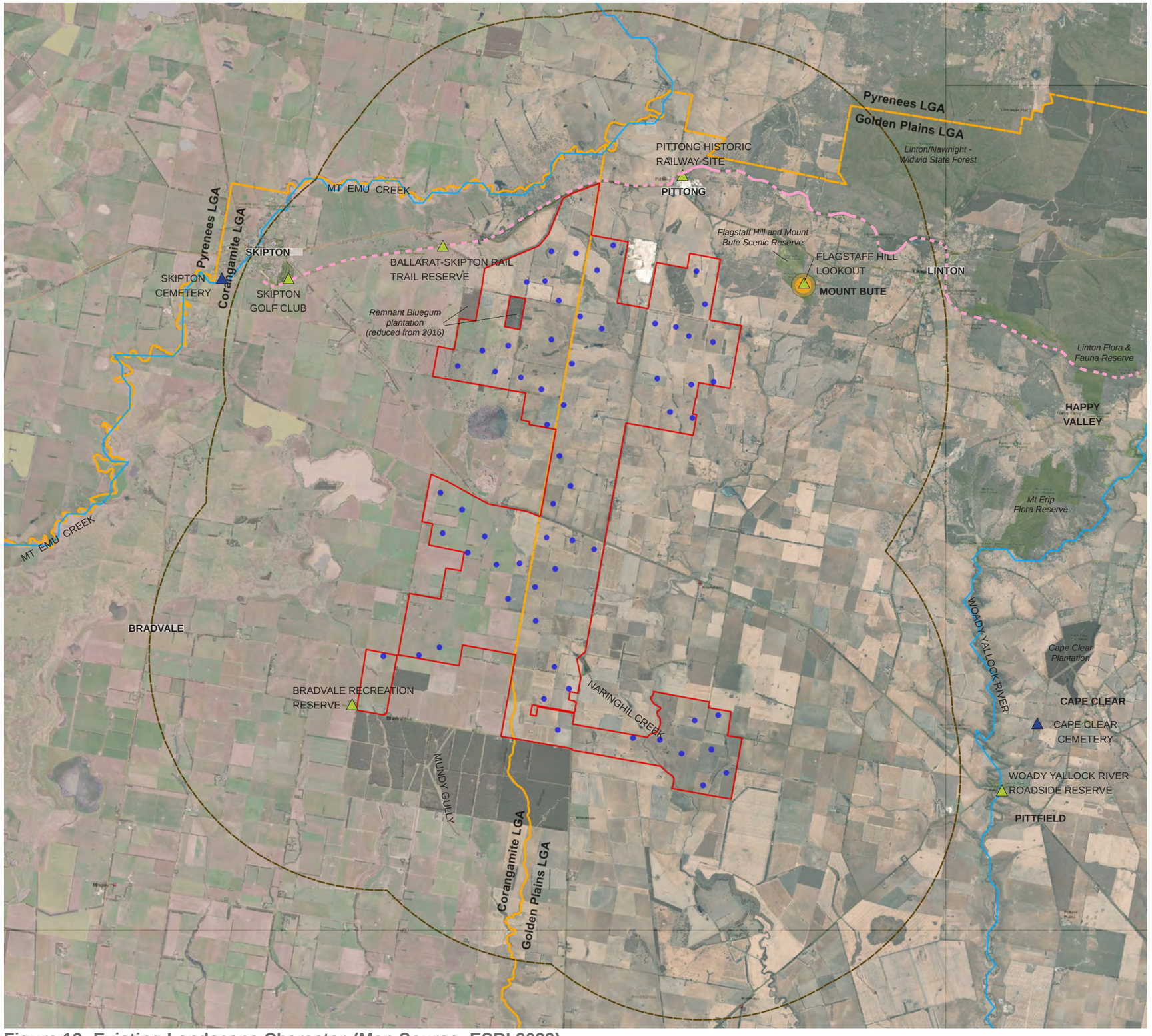
Prevalence of fertile volcanic soils across the Western Plains has led to the development of extensive agricultural activity in this area. The region's economic growth depends extensively on the agricultural and pastoral activity in the region. The primary activities associated with farming within the surrounds of Skipton and Linton are livestock grazing and cropping. Cattle farming and grain production are the most important sectors of agricultural production in the areas around Pittong and Skipton (Agriculture Victoria, 2018).

Image 21 Landscape has been modified to support plantation forestry typical within the Study Area.

Image 22 Existing transmission line forms part of the visual character

Image 23 Typical character of the Project Area

Image 24 General character of the area - modified landscapes with other views to Stockyard Hill and Berryban Wind Farm



Existing Landscape Character

Moreton Hill Wind Farm

LEGEND

- Project Boundary
- Proposed 252 m Turbine Location
- 6km Study Area
- Water bodies/wetlands
- Highpoints
- Rivers & creeks
- Parks / recreation reserves
- Cemetery
- Ballarat - Skipton Rail Trail

N

0 2 4 6 8km

Figure 13: Existing Landscape Character (Map Source: ESRI 2023)

5.6 Preliminary Landscape Character Unit Assessment

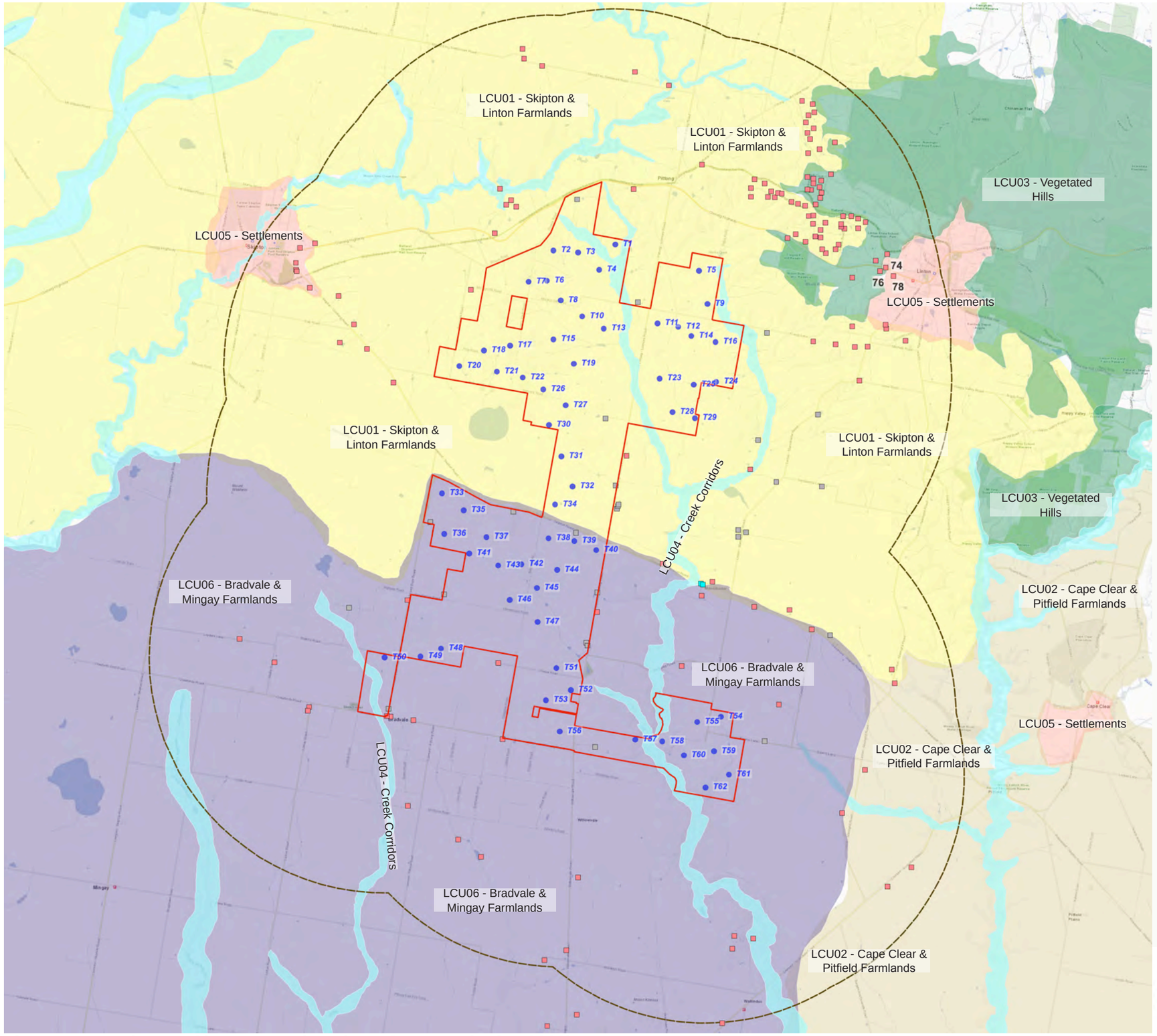
A number of Landscape Character typologies exist within the Study Area (refer to **Figure 14**). As a part of the Preliminary Landscape Character Assessment, a total of six (6) key landscape typologies referred to hereafter as Landscape Character Units (LCUs) have been identified based on an assessment of the existing landscape character and a site visit that was conducted by Moir LA in April 2023.

Table 6 provides an overview of the LCUs and a brief overview of the potential visibility of the Project from each of the LCUs is provided in **Table 7**.

Landscape Character Units

LCU:	Name:	General Character:
LCU01	**Skipton & Linton Farmlands**	*Comprises of parcels of land that are extensively used for agriculture and grazing. Land is highly modified. Generally located between Skipton and Linton and along Glenelg Highway.*
LCU02	**Cape Clear & Pitfield Farmlands**	*Gently undulating modified pastures predominantly used for agriculture and livestock grazing. Generally located east of the Project.*
LCU03	**Vegetated Hills**	*Gently undulating vegetated hills with Mount Bute and Flagstaff Hill Reserve. Vegetation character is predominantly modified for plantation forestry or native grazing.*
LCU04	**Creek Corridors**	*Comprises of water bodies that traverse the landscape. Most creek corridors are seasonal.*
LCU05	**Settlements**	*Historic towns, localities and settlements with low density residential character scattered around town. Topography is gently undulating with highly modified vegetation character.*
LCU06	**Bradvale & Mingay Farmlands**	*Open expansive flat parcels of land modified for agriculture and grazing. Topography is gently undulating with vegetation primarily cleared to support agricultural and pastoral activities.*

Table 6: Overview of Landscape Character Units



Landscape Character Units

Moreton Hill Wind Farm

LEGEND

- Project Boundary
- Proposed 252 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Council owned buildings
- 6,000 m from nearest turbine

Landscape Character Units:

- LCU01 - Skipton & Linton farmlands
- LCU02 - Cape Clear & Pitfield farmlands
- LCU03 - Vegetated Hills
- LCU04 - Creek corridors
- LCU05 - Settlements
- LCU06 - Bradvale and Mingay Farmlands

N

0 2 4 6 8km

Figure 14: Landscape Character Units (Map Source: VicPlan 2023)

LCU01: Skipton & Linton Farmlands

This LCU is defined by the cleared, planar lands and farming lots that are located between Skipton and Linton on either side of Glenelg Highway. Land is extensively used for livestock grazing and agriculture. Typical character is defined by modified pastures with scattered vegetation on a gently undulating to flat terrain. Vegetation is generally defined by windbreak plantations and patches of native vegetation that are interspersed on the rural farm lots.

See Images 25 and 26.

Image 25

Farmlands to the east of Skipton.

Image 26

Open, expansive views over cleared lands that are extensively used for grazing and dry cropping with views of scattered wind break vegetation.

LCU02: Cape Clear & Pitfield farmlands

The LCU is defined by gently undulating modified agricultural lands located east near the settlements of Cape Clear and Pitfield. Lands have been extensively cleared, modified and used for grazing and cropping. Vegetation character has been modified to suit agricultural land uses and is characterised by windbreak and corridor vegetation along roadsides. Most views are open and some are directed towards high points in the landscape. Woady Yallock River flows through this LCU.

See Images 27 and 28.

Image 27

Farmlands near Cape Clear and Pitfield are generally gently undulating. Vegetation is patchy and often visible around scattered rural dwellings.

Image 28

Gentle undulations and views directed towards high points in the landscape represent character of this LCU.

LCU03: Vegetated Hills

Located to the close to Linton, this LCU is defined predominantly by vegetated hills. Vegetation character has evidence of human intervention through plantation forestry and State Forests reserves. Elevated terrain overlooks the flat planar farmlands to the south. Patches of remnant vegetation are visible along road corridors. Dwellings are scattered within this LCU. Linton is located at the foothills of this LCU to the east. Mt Bute Recreational Reserve and Flagstaff Hill Lookout are some recreational associations located within this LCU.

See Images 29 and 30.

Image 29

View from Flagstaff Hill towards the flat Planar fields and modified land with plantation forestry.

Image 30

Typical vegetation character along road corridors in the LCU.

LCU04: Creek corridors

This LCU comprises of seasonal creek channels located on a gently sloping terrain. Vegetation character along these creeks is typical of this LCU. The natural character has been retained to a large extent and is reminiscent of the Victorian Volcanic Plain Bioregion vegetation character. No recreational associations were identified.

See Images 31 and 32.

Image 31

Typical character within this LCU. View of Naringhil Creek. Vegetation is primarily of Volcanic Plain Bioregion IBRA with adjoining lands modified for agriculture and grazing.

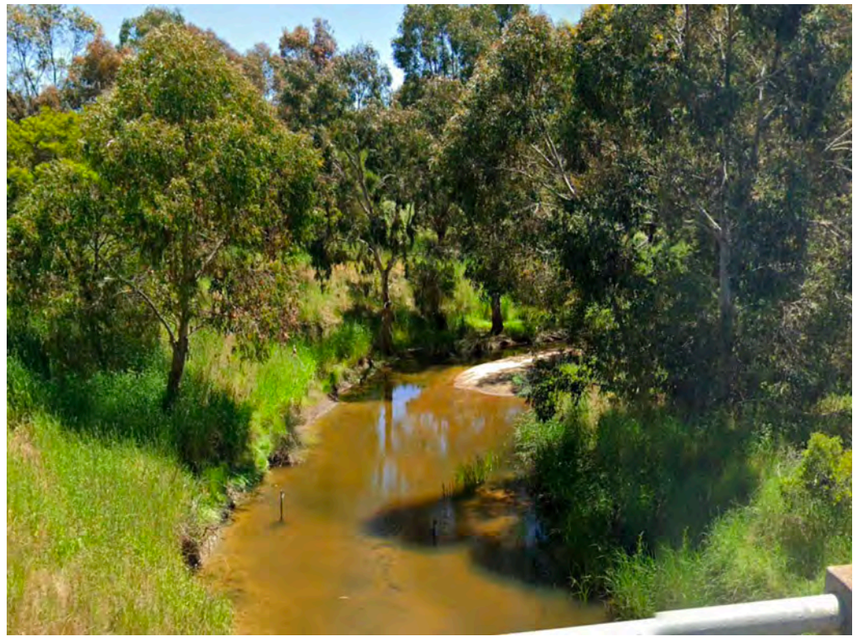


Image 32

Typical riparian vegetation character.

LCU05: Settlements

Typical character within this LCU is predominantly historic towns and villages settled along Creek channels. Important settlements include Skipton, Linton and Cape Clear. Skipton is settled on the banks of Mt Emu Creek and can be accessed via Glenelg Highway. The vegetation character within this LCU is predominantly modified and most tracts of vegetation form the windbreak plantation belts for dwellings. The terrain is often gently undulating with farmlands surrounding these towns.

See Images 33 and 34.

Image 33

View of Skipton Town and surrounding areas. This character is typical within this LCU.

Image 34 View from the main street in Linton. Character is predominantly residential or commercial enterprises on either side of the road corridor

(Source: Google Street View)

LCU06: Bradvale and Mingay Farmlands

The LCU is defined by gently undulating to flat planar open agricultural pastures. Land has been extensively cleared, modified and used for grazing and cropping. Vegetation character is characterised by windbreak and corridor vegetation along roadsides. Patches of land have been modified to be used for plantation forestry.

See Images 35 and 36.

Image 35

View of along Lismore - Pittong Road. Some parcels of land have been converted for timber production.

Image 36

Typical character within this LCU.

Landscape Character Units			
LCU:	**Name:**	**General Character:**	**Preliminary Visual Impact Assessment**
LCU01	**Skipton & Linton Farmlands**	*Comprises of parcels of land that are extensively used for agriculture and grazing. Land is highly modified. Generally located between Skipton and Linton and along Glenelg Highway.*	Some turbines associated with the Project are located within this LCU. Views from this LCU are generally open due to intermittent canopy cover and lack of topographical changes. Views towards the Project are likely to be available from most locations. However, existing roadside vegetation and planting around dwellings may help reduce visibility in those areas.
LCU02	**Cape Clear & Pitfield Farmlands**	*Gently undulating modified pastures predominantly used for agriculture and livestock grazing. Generally located east of the Project.*	Preliminary assessments based on topography alone indicates that highest visibility of turbines will be potentially around the farmlands and residences located in proximity to the Project. Areas around Cape Clear further to the east are likely to have limited views due to the undulating topography and intervening vegetation around dwellings and along roadsides.
LCU03	**Vegetated Hills**	*Gently undulating vegetated hills with Mount Bute and Flagstaff Hill Reserve. Vegetation character is predominantly modified for plantation forestry or native grazing.*	Views from this LCU are likely to be limited from certain areas that are close to elevated points in the landscape such as Flagstaff Lookout. Views of the Project would be generally contained by vegetation from other areas within this LCU.
LCU04	**Creek Corridors**	*Comprises of water bodies that traverse the landscape. Most creek corridors are seasonal.*	The LCU is characterised by gently sloping and level terrain in certain areas. Native vegetation lines the creek corridors and it is likely that this vegetation will play an important role in limiting views from this LCU towards the Project. There are no recreational association identified in this LCU within the Study Area.
LCU05	**Settlements**	*Historic towns, localities and settlements with low density residential character scattered around town. Topography is gently undulating with highly modified vegetation character.*	The character of Skipton is defined by a gently undulating terrain and majority of the streets and dwellings comprise of dense vegetation. Views to the Project are likely to be partially available, however, it is likely that the Project will not dominate the existing visual character in this town. Existing vegetation around dwellings is likely to assist in limiting views. Linton is located east of the Project and is surrounded by LCU03. It is likely that views from this settlement will be limited by intervening vegetation. Cape Clear is a settlement located approximately 9 km east of the Project. It is likely that views will be limited due to existing topographic character and vegetation around the rural dwellings.
LCU06	**Bradvale & Mingay Farmlands**	*Open expansive flat parcels of land modified for agriculture and grazing. Topography is gently undulating with vegetation primarily cleared to support agricultural and pastoral activities.*	Large, open expansive farmlands with modified vegetation in the form of wind breaks surrounding the dwellings. These areas will have views of the Project due to the lack of intervening elements such as vegetation and topographical changes.

Table 7: Overview of Preliminary Visual Impact Assessment of LCUs

06

Public Viewpoint Analysis

6.0 Public Viewpoint Analysis

6.1 Overview of Public Viewpoint Analysis

In addition to the analysis of the existing landscape character, viewpoint analysis has been undertaken from a total of **25** public locations. Viewpoints have been carefully selected to be representative of the range of views within the Study Area.

The selection of viewpoints is generally informed by topographical maps, field work observations and other relevant influences such as access, proximity to residences, landscape character and the popularity of vantage points. Viewpoints are selected to illustrate a combination of the following:

- viewpoints identified through assessment of the existing character,
- present landscape character types,
- areas of potentially high landscape or scenic value,
- range of distances,
- varying aspects and elevations,
- varying extent of wind farm visibility (full and partial visibility), and
- sequential views along specific routes.

It is important to note that viewpoints for this PLVIA study have been taken predominantly on accessible public land (typically roads) which were identified as having a high or moderate potential for visibility of the Project.

The viewpoint locations assessed for the Project have included key viewpoints identified through assessment of the existing landscape character.

Selected viewpoint assessment locations are shown on **Figure 15**.

6.2 Photography Methodology

Photographs used for viewpoints are taken on a level tripod at a height of 150 cm (to represent eye level). Photographs were taken with a Canon EOS 5D Mark IV Full Frame digital SLR through a 50mm fixed focal lens which closely represents the central field of vision of the human eye. Parameters for the photography is provided in **Table 8**.

The visual impact of the viewpoint was assessed both on site and through a desktop assessment utilising with the topographic and aerial information to ensure accuracy.

The locations of the viewpoints have been identified in **Figure 15** and the general viewing direction of each viewpoint is identified on the map on each viewpoint.

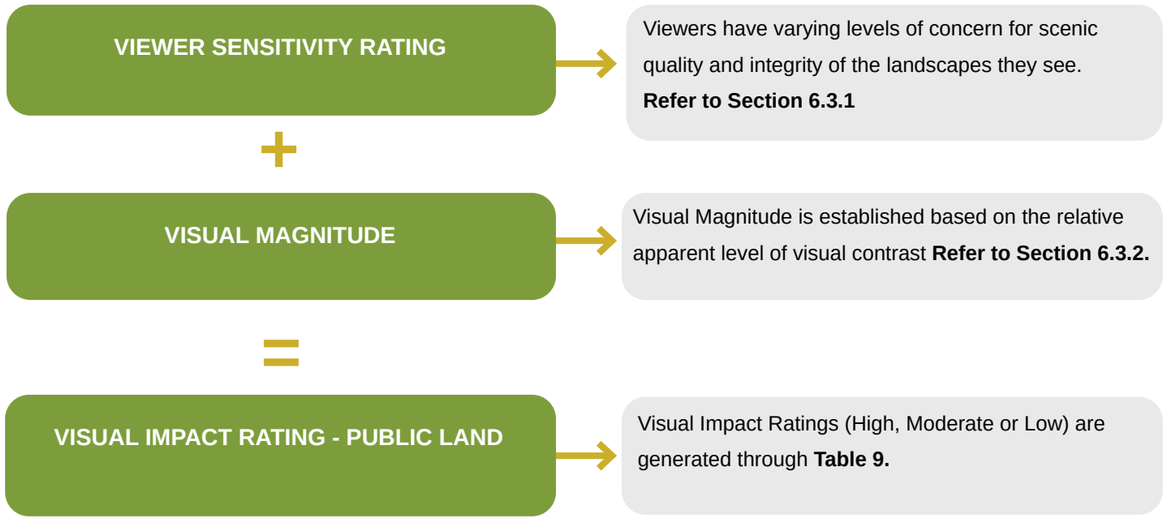
Viewpoint analysis prepared for the Project has been included as Appendix B.

Photography Specifications:	
Camera Make and Model:	**Canon EOS 5D Mark IV Full Frame Digital SLR**
Lens:	**EF50mm f/1.2L USM**
Focal Length:	**50mm f/0**
Aperture Setting:	**f/6.3 - 10**
Tripod Height:	**150cm**

Table 8: Photography Specifications

6.3 Public Viewpoint Study Method

The visual impact assessment for each public viewpoint location is assessed based on the relationship between the visual sensitivity (refer to **Section 6.3.1**) and visual magnitude (refer to **Section 6.3.2**). The following section provides an overview of the methodology implemented to determine the level of visual impact at each public viewpoint location.



6.3.1 Viewer Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different areas. The assessment is based on the number of people affected, land use, and the distance of the viewer from the proposal (Transport for NSW, 2020).

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

• Visual sensitivity decreases as the viewing time decreases.
• Visual sensitivity decreases as the number of potential viewers decreases.
• Visual sensitivity can also be related to viewer activity (e.g. A person viewing an affected site whilst engaged in recreational activities will be more strongly affected by change than someone passing a scene in a car travelling to a desired destination).

6.3.2 Visual Magnitude

Visual magnitude refers to the extent of change that will be experienced by receptors. Factors that are considered when assessing the magnitude of change include:

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

(AILA, 2018)

6.3.3 Visual Impact

Visual impact refers to the change in appearance of the landscape as a result of development. (EPHC, 2010). Visual impact is the combined effect of visual sensitivity and visual magnitude. Various combinations of visual sensitivity and visual magnitude will result in high, moderate and low overall visual impacts as suggested in **Table 9** below (Transport for NSW, 2020).

VISUAL IMPACT RATING					
		VISUAL MAGNITUDE			
		HIGH	MODERATE	LOW	NEGLIGIBLE
VISUAL SENSITIVITY	HIGH	HIGH	HIGH-MODERATE	MODERATE	NEGLIGIBLE
	MODERATE	HIGH-MODERATE	MODERATE	MODERATE-LOW	NEGLIGIBLE
	LOW	MODERATE	MODERATE-LOW	LOW	NEGLIGIBLE
	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE

Table 9: Visual Impact Rating Table (Adapted from Transport for NSW, 2020)

Public Viewpoint Analysis Locations

Moreton Hill Wind Farm

LEGEND

- Project Boundary
- Proposed 252 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Roads
- 2000 m from turbines
- 4000 m from turbines
- 6000 m from turbines
- Public Viewpoint Analysis Location - **Refer to Appendix B**

VP01, VP02, VP03, VP04, VP05, VP06, VP07, VP08, VP09, VP10, VP11, VP12, VP13, VP14, VP15, VP16, VP17, VP18, VP19, VP20, VP21, VP22, VP23, VP24, VP25

Pyrenees LGA
Golden Plains LGA
Corangamite LGA
Linton
Happy Valley
Cape Clear
Mingay
Linton Nawnight -Wildwid State Forest
Flagstaff Hill Reserve
Lint Flora and Fauna Reserve
Mount Erip Flora Reserve

N

0 2 4 6 8 10km

Figure 15: Public Viewpoint Analysis Locations (Map Source: VicPlan 2023)

6.4 Summary of Viewpoint Analysis

25 public viewpoints assessed for the purpose of this PLVIA were taken from varying distances and locations surrounding the Project. A summary of the visual impact ratings for each of the public viewpoint location assessed has been provided as **Table 10.**

Of the 25 viewpoints:

- 12 public viewpoint locations were assessed as having a Low visual impact rating.
- Six (6) public viewpoint locations were assessed as having a Moderate-Low visual impact rating.
- Six (6) public viewpoint locations were assessed as having a Moderate visual impact rating.
- One (1) public viewpoint location was assessed as having a High visual impact rating.

Generally, those with a visual impact rating of Moderate and High are due to the higher visual magnitude which is determined of the magnitude of change to the landscape character and close proximity to the Project.

Summary of Public Viewpoint Analysis

Viewpoint	Location	Distance to Nearest Turbine	Visual Sensitivity	Visual Magnitude	Visual Impact Rating
VP01	Lismore-Scarsdale Road, Wallinduc, VIC	6.89 km	LOW	LOW	LOW
VP02	Lismore-Scarsdale Road, Mannibadar VIC	5.04 km	LOW	LOW	LOW
VP03	Rokewood-Skipton Road, Pitfield VIC	7.07 km	LOW	LOW	LOW
VP04	Cemetery Road, Cape Clear VIC	8.22 km	LOW	LOW	LOW
VP05	Intersection of Linton-Naringhil Road and Happy Valley Crossing Road, Linton VIC	5.89 km	LOW	LOW	LOW
VP06	Rokewood-Skipton Rd, Mannibadar VIC	3.20 km	LOW	LOW	LOW
VP07	Intersection of Lismore-Pittong Road and Willowvale Road,Mannibadar VIC	0.55 km	LOW	HIGH	MODERATE
VP08	Willowvale Road, Willowvale VIC	5.30 km	LOW	LOW	LOW
VP09	Barrs Road, Mount Bute VIC	6.88 km	LOW	LOW	LOW
VP10	Lismore-Pittong Road, Bradvale VIC	3.72 km	LOW	LOW	LOW
VP11	Crawfords Road, Bradvale VIC	1.56 km	MODERATE	MODERATE	MODERATE
VP12	Mount Bute Road, Bradvale VIC	1.33 km	LOW	HIGH	MODERATE
VP13	Currie Street, Skipton VIC	6.59 km	MODERATE	LOW	MODERATE-LOW
VP14	Glenelg Highway, Skipton VIC	5.55 km	MODERATE	LOW	MODERATE-LOW
VP15	Linton-Mannibadar Road, Linton VIC	2.41 km	LOW	MODERATE	MODERATE-LOW
VP16	Francis Lane, Linton VIC	1.23 km	LOW	HIGH	MODERATE
VP17	Pittong-Snake Valley Road, Pittong VIC	2.15 km	MODERATE	MODERATE	MODERATE
VP18	Mount Emu Settlement Road, Pittong VIC	4.21 km	LOW	LOW	LOW
VP19	Pittong-Snake Valley Road, Pittong VIC	2.59 km	MODERATE	LOW	MODERATE-LOW
VP20	Glenelg Highway, Pittong VIC	1.60 km	LOW	HIGH	MODERATE
VP21	Glenelg Highway, Skipton VIC	1.46 km	LOW	MODERATE	MODERATE-LOW
VP22	Glenelg Highway, Skipton VIC	4.47 km	LOW	LOW	LOW
VP23	Skipton-Geelong Road, Skipton VIC	4.86 km	LOW	LOW	LOW
VP24	Rokewood-Skipton Road, Skipton VIC	1.66 km	LOW	MODERATE	MODERATE-LOW
VP25	The Flagstaff Hill Lookout, Flagstaff Ridge Road, Pittong VIC	2.61 km	HIGH	HIGH	HIGH

Table 10: Visual Impact Rating Table (Adapted from Transport for NSW, 2020)

07

Dwelling Analysis

7.0 Dwelling Analysis

7.1 Overview of Dwelling Assessment

Section 3.0 of this report defines the 'visual catchment' of this Project. This section identifies non-involved dwellings within the Study Area that require detailed assessment. Due to the large scale of the Project, relatively flat to gently undulating topography around the Project Site and number of dwellings within the visual catchment, representative dwellings within the Study Area have been assessed to provide an indication of the potential visual impacts from surrounding dwellings (See **Figure 16**).

The following dwellings have been assessed and included in **Appendix A**:

- 20 non-involved dwellings within 2,000 m of the nearest turbine associated with the Project.
- 68 non-involved dwellings between 2,000 - 4,000 m of the nearest turbine associated with the Project.
- 43 non-involved dwellings between 4,000 - 6,000 m of the nearest turbine associated with the Project.

7.2 Study Method for Dwelling Assessment

Further detailed assessment identified a number of dwellings within the visual catchment are likely to have limited or no views to the Project due to screening factors such as vegetation and/or existing structures. **Figure 16** provides an overview of the vegetation character around all non-involved dwellings within approximately 6,000 m of the Project.

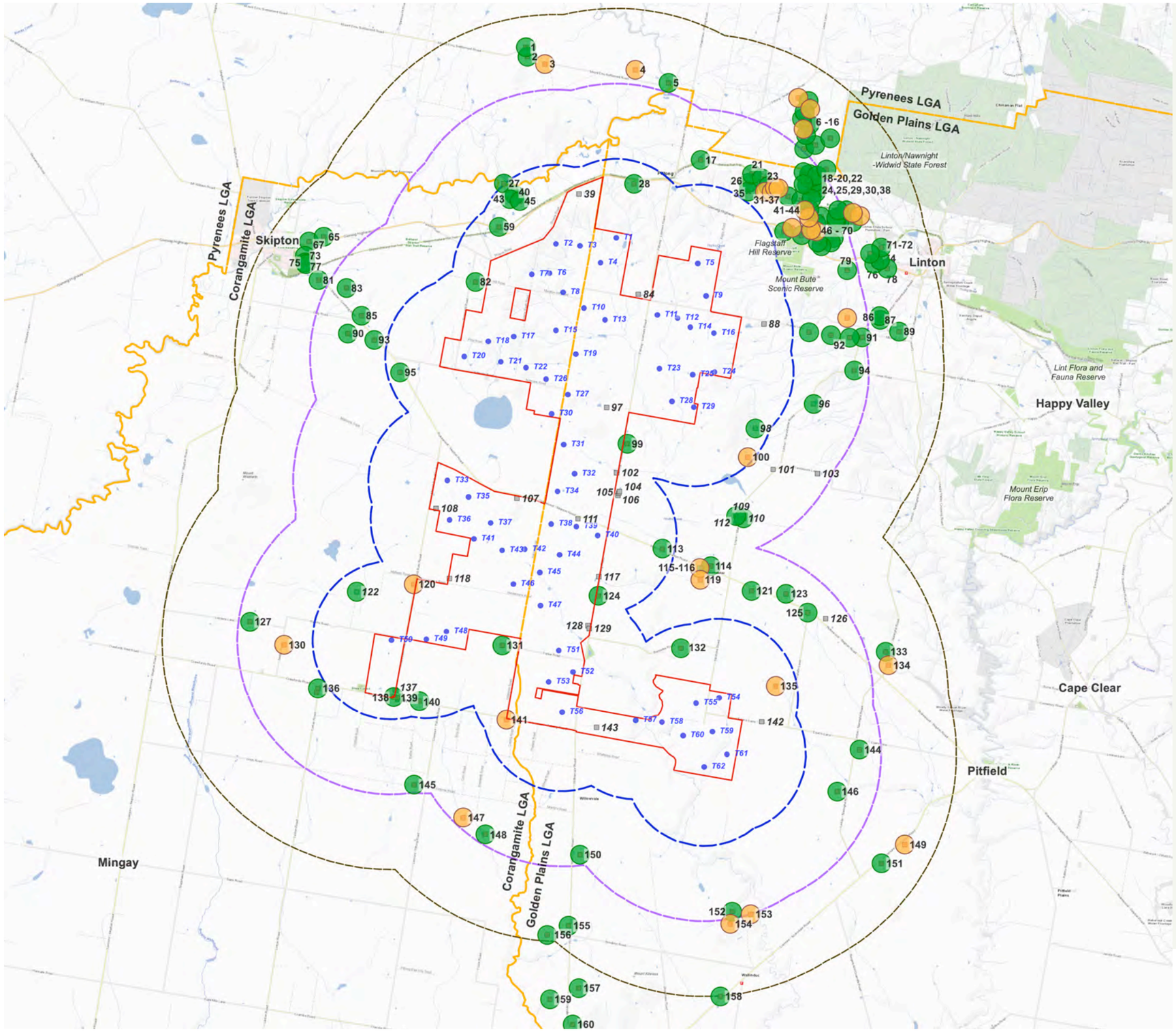
Table 11 provides an overview of the study method for undertaking the dwelling assessment for each dwelling identified within the visual catchment.

Study Method	Process
Step 1. 3D Assessment (based on topography alone)	Using 3D modelling, Moir LA identified turbines which will be visible from the dwelling based on topography alone. Where turbines are likely to be visible, additional analysis has been undertake to determine the extent of visibility.
Step 2. Aerial Imagery	Information on the extent of visibility extracted from the 3D model is overlaid onto a recent aerial image of the dwelling and its surrounds. This provides a detailed assessment of the direction and extent of potentially visible turbines and identifies any intervening elements (such as structures, wind break planting or vegetation) which may reduce the potential visibility.
Step 3. Consideration of mitigation methods	For non-involved dwellings where the Project has the potential to cause visual impact, mitigation methods have been suggested. **Refer to Section 11.0.**

Table 11 Dwelling Assessment Process

Character of Nearby Dwellings

Moreton Hill Wind Farm



LEGEND

- Project Boundary
- Proposed 252 m Turbine Location
- Non-involved Dwellings
- Involved Dwellings
- Non-involved Dwellings surrounded by moderate to dense screening vegetation
- Non-involved Dwellings with potential to view a part of the Project
- Roads
- 2000 m from turbines
- 4000 m from turbines
- 6000 m from turbines

N

0 2 4 6 8km

Figure 16: Character of nearby dwellings (Map Source: VicPlan 2023)

Dwelling Analysis Locations

Moreton Hill Wind Farm

LEGEND

- Project Boundary
- Proposed 252 m Turbine Location
- Involved Dwellings
- Non-involved Dwellings
- Roads
- 2000 m from turbines
- 4000 m from turbines
- 6000 m from turbines
- Dwelling Analysis Location - **Refer to Appendix A**

N

0 2 4 6 8km

Figure 17: Dwelling Analysis Locations (Map Source: VicPlan 2023)

7.3 Summary of Preliminary Dwelling Assessment

7.3.1 Dwellings located within 2,000 metres of the nearest turbine

A total of 20 non-involved dwellings were identified within 2,000 metres of a proposed turbine. Of these, 16 dwellings are surrounded by screening elements such as vegetation and / or structures which will help limit views of the Project.

Representative dwelling assessments have been undertaken for four (4) non-involved dwellings within the 2,000 m of the nearest turbine. An overview of the visual assessment for these dwellings has been included in **Appendix A**.

7.3.2 Dwellings located within 2,000 - 4,000 metres of the nearest turbine

A total of 68 non-involved dwellings were identified within 2,000 - 4,000 metres of a proposed turbine. Of these, 54 dwellings are surrounded by screening elements such as vegetation and/or structures which will help limit views of the Project.

Representative dwelling assessments have been undertaken for five (5) non-involved dwellings within the 2,000 - 4,000 m of the nearest turbine. An overview of the visual assessment for these dwellings has been included in **Appendix A**.

7.3.3 Dwellings located within 4,000 - 6,000 metres of the nearest turbine

A total of 42 non-involved dwellings were identified within 4,000 - 6,000 metres of a proposed turbine. Of these, 32 dwellings are surrounded by screening elements such as vegetation and/or structures which will help limit views of the Project.

Representative dwelling assessments have been undertaken for six (6) non-involved dwellings within the 4,000 - 6,000 m of the nearest turbine. An overview of the visual assessment for these dwellings has been included in **Appendix A**.

7.3.4 Dwellings located outside 6,000 metres of the nearest turbine

A total of 11 non-involved dwellings were identified outside 6,000 metres of a proposed turbine. Of these, 10 dwellings are surrounded by screening elements such as vegetation and/or structures which will help limit views of the Project. An overview of the potential impact on the remaining one (1) dwelling has been discussed in **Table 12**.

In addition to the detailed assessment of dwellings identified within the visual catchment, Moir LA undertook an extensive Viewpoint Analysis which provides representative visual assessments that are around the Project (refer to **Appendix B**).

Non involved dwellings outside of 6000 metres of nearest WTG					
Dwelling ID:	**Location**	**Approx distance to nearest WTG (km)**	**Nearest WTG**	**Approx. number of potentially visible WTGs (Based on ZVI)**	**Summary of assessment**
169	**Calverts Road**	**10.54 km**	**T56**	**up to 62**	*Views of Project likely to be available to the north. Existing vegetation surrounding the dwelling and along the boundary will assist in filtering views of the Project.*

Table 12: Overview of Preliminary Assessment for non involved dwellings outside 6,000 metres

08

Photomontages and Wireframe Diagrams

8.0 Photomontages and Wire Frame Diagrams

8.1 Overview of Photomontages and Wire Frame Diagrams

8.1.1 Photomontages

A photomontage combines a photograph of an existing view with a computer-rendered image of a proposed development. Photomontages are used to illustrate the likely view of a proposed development as it would be seen in a photograph (not as it would appear to the human eye in the field).

Although photomontages are based on a photograph of the existing landscape, it is important to note that they are only one tool to aid assessment. They provide a two-dimensional image that can be compared with an actual view of the landscape to provide information, such as the scale and potential appearance of a proposed development.

Photomontages prepared for the Project have been included as Appendix C.

8.1.2 Wire Frame Diagrams

A wire frame is a computer generated image based on a digital terrain model, that indicate the 3D shape of the landscape in combination with additional elements. They are a valuable tool in the assessment process as they allow the assessor to compare the position and scale of the turbines to the existing view of a landscape (Scottish Natural Heritage, 2017). Wire frame images can be seen as a worst case scenario as they do not take into account factors such as vegetation, building structures.

Wire frame diagrams have been utilised in this PLVIA to assist in the assessment of the Project from inaccessible locations. **Appendix C** includes wire frame diagrams for the various viewpoint locations that were chosen for preparation of photomontages. Wireframe diagrams have been utilised as an assessment tool to provide a worst case scenario view of the proposal.

8.2 Photomontage Limitations

Visualisations in themselves can never provide the full picture in terms of potential impacts; they only inform the assessment process by which judgements are made. Visualisations of wind farms have a number of limitations. These include:

- A visualisation can never show exactly what the wind farm will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
- The images provided give a reasonable impression of the scale of the turbines and the distance to the turbines, but can never be 100% accurate;
- A static image cannot convey turbine movement, or flicker or reflection from the sun on the turbine blades as they move.

Scottish Natural Heritage Visual Representation of Wind Farms, Version 2.2 February 2017.

8.3 Photomontage Selection Process

Viewpoints have been selected for the preparation of photomontages to best illustrate the potential appearance of the proposed wind farm from varying distances and locations with differing views in public locations (refer to **Figure 19**).

A total of ***10 public viewpoint locations*** selected for the preparation of visual photomontages are based on an assessment of the existing landscape character, land use and points of interest within the Study Area. Exact photomontage locations were selected to represent a worst case scenario for the viewpoint location. Localised screening factors such as vegetation were avoided (where possible) to ensure maximum exposure to the Project.

Public Receptor Photomontages		
Photomontage PM01	**Viewpoint VP19**	**Pittong-Snake Valley Road, Pittong**
Photomontage PM02	**Viewpoint VP25**	**Flagstaff Hill Lookout, Pittong**
Photomontage PM03	**Viewpoint VP21**	**Glenelg Highway, Skipton**
Photomontage PM04	**Viewpoint VP23**	**Skipton - Geelong Road, Skipton**
Photomontage PM05	**Viewpoint VP13**	**Currie Street, Skipton**
Photomontage PM06	**Viewpoint VP11**	**Crawfords Road, Bradvale (near Bradvale Recreation Reserve)**
Photomontage PM07	**Viewpoint VP04**	**Cemetery Road, Cape Clear**
Photomontage PM08	**Viewpoint VP09**	**Barrs Road, Mount Bute**
Photomontage PM09	**Viewpoint VP16**	**Francis Lane, Linton**
Photomontage PM10	**Viewpoint VP06**	**Rokewood - Skipton Road, Mannibadar**

Table 13: Overview of Photomontage and Wire Frame Diagram Locations

8.4 Photomontage Development Methodology

The process for generating the photomontages involves computer generation of a wire frame perspective view of the wind turbines and the topography from each viewpoint. Photomontages have been prepared in accordance with the Scottish Natural Heritage Visual Representation of Wind Farms, Version 2.2 February 2017. The process for photomontage development is demonstrated in **Figure 18**.

The photomontages are based on a worst case scenario of a maximum turbine tip height dimension of 252 m without the inclusion of any proposed mitigation methods.

Moir LA have prepared the photomontages using the most current available version of Wind Pro software using the following process:

Step 1: Develop 3D Model

Detailed 3D model of the Site is developed in Wind Pro. The wind turbines and associated infrastructure (substations, transmission lines, wind masts etc.) are modelled and sited in the 3D model to scale.

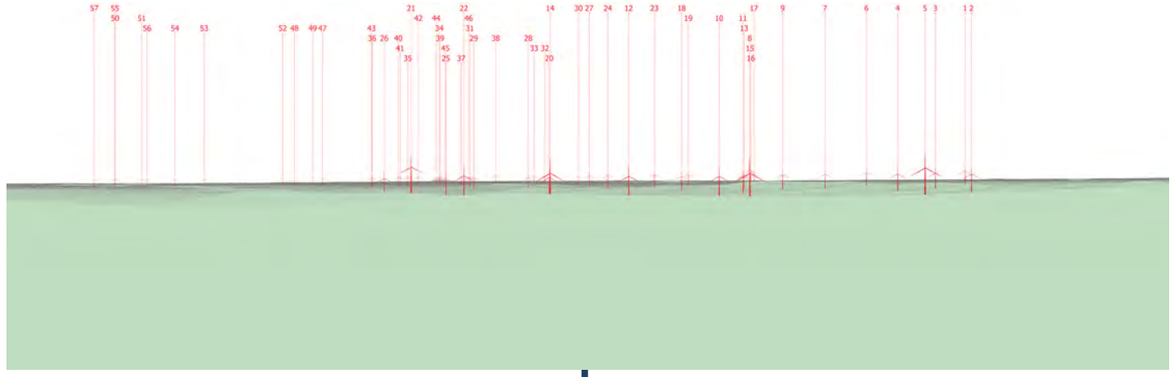
Step 2: Align Photograph and Model

The digital panorama is imported into Wind Pro and EXIF properties of the file are inserted automatically defining all relevant visualization information such as type of camera lens used, field of view for panoramas, the position and direction. Topography, control points, obstacle objects, existing wind masts can be used as reference to calibrate the camera model precisely.

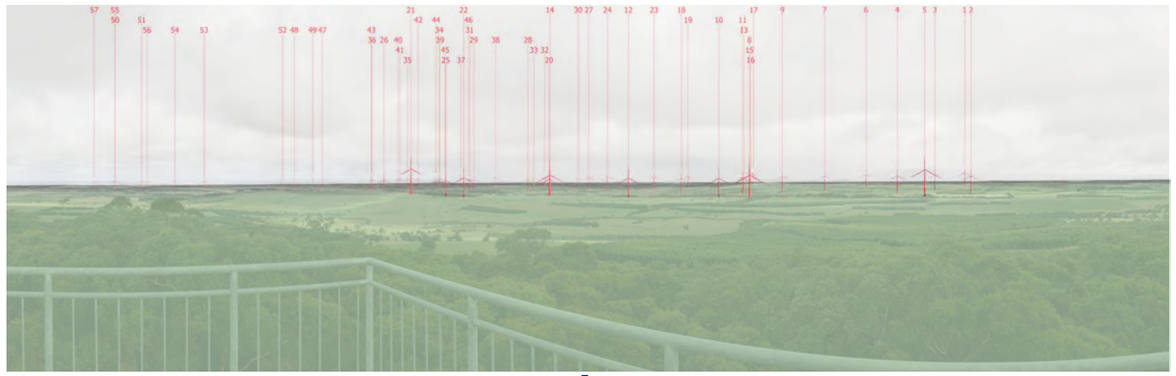
Step 3: Render Photomontage

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

Step 1: Develop 3D Model (Wire Frame Diagram)



Step 2: Align photograph and model



Step 3: Render Photomontage

Figure 18: Example of Photomontage Development Process

Photomontage and Wireframe Diagram Locations

Moreton Hill Wind Farm

LEGEND

- Project Boundary
- Proposed 252 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Roads
- 2000 m from turbines
- 4000 m from turbines
- 6000 m from turbines
- Public Photomontage Location - **Refer to Appendix C**

PM01
PM02
PM03
PM04
PM05
PM06
PM07
PM08
PM09
PM10

Pyrenees LGA
Golden Plains LGA
Corangamite LGA
Skipton
Linton
Happy Valley
Cape Clear
Pitfield
Mingay
Linton Nawnight -Widwid State Forest
Flagstaff Hill Reserve
Mount Bute Scenic Reserve
Lint Flora and Fauna Reserve
Mount Erip Flora Reserve

N

0 2 4 6 8 10km

Figure 19: Phomontage and Wireframe Diagram locations (Map Source: VicPlan 2023)

09

Cumulative Visual Impact Assessment

9.0 Cumulative Visual Impact Assessment

9.1 Overview of Cumulative Visual Impacts

Cumulative landscape and visual effects result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it) or actions that occurred in the past, present or are likely to occur in the foreseeable future (Landscape Institute et al, 2002). Cumulative effects may also affect the way a landscape is experienced and can be positive or negative. Where they comprise benefits, they may be considered to form part of the mitigation measures.

It is important that the proposed Moreton Hill Wind Farm considers the potential cumulative effects on the immediate and broader regional context it forms part of.

A cumulative impact assessment has several dimensions:

- The impact of the wind farm, when added to the combined impacts of all other existing developments and environmental characteristics of the area.
- The impact of this development in the context of the potential for development of wind energy developments in the local, regional and national context.
- The impact of developments which are ancillary to or otherwise associated with the proposed wind farm eg. the development of transmission lines.
- The potential for future development of wind farms in the region.

9.2 Nearby Wind Farm Projects

The Project is located within Western Victoria Renewable Energy Zone (REZ). The REZ has been identified by the Victorian Government through its Climate Change Strategy. The REZ is expected to play a vital role in providing clean energy to communities across Victoria (DELWP, 2021) (See **Figure 17**).

The Project is located within proximity of four (4) wind farm projects:

- Stockyard Hill Wind Farm (Operating)
- Berrybank Wind Farm (Operating)
- Golden Plains Wind Farm (Under construction)
- Chepstowe Wind Farm (Operating)

In addition to the above mentioned wind farm projects, a total of 12 proposed, approved and operational wind farms are located within 70 km of the Project. **Table 14** lists all wind farm projects in proximity and their approximate size and planning status. **Figure 18** shows the location of projects in close proximity**.** A detailed assessment of the potential cumulative visual impact has been undertaken for Stockyard Hill Wind Farm (located approximately 3 km north), Chepstowe Wind Farm (located approximately 8 km north), Berrybank Wind Farm (located approximately 9.5 km south) and Golden Plains Wind Farm (located 10 km south east of the Project) has been discussed in the following section of this report.

Project	Distance and direction of Wind Farm from the Project	Project Size *Estimated	Planning Status
Operational Wind Farms			
Chepstowe Wind Farm	8 km North	3 turbines	Operational
Waubra Wind Farm	34 km North	128 turbines	Operational
Mortlake South Wind Farm	61 km Southwest	35 turbines	Operational
Salt Creek Wind Farm	55 km west	15 turbines	Operational
Mt Gellibrand Wind Farm	55 km Southeast	44 turbines	Operational
Moorabool Wind Farm	60 km East	104 turbines	Operational
Dundonnell Wind Farm	37 km West	80 turbines	Operational
Mt Mercer Wind Farm	35 km East	64 turbines	Operational
Lal Lal (Elaine and Yendon) Wind Farm	51 km East	60 turbines	Operational
Proposed Wind Farms			
Mount Fyans Wind Farm	37 km West	*85 turbines	Planning Permit Application lodged and process underway
Inverleigh Wind Farm	70 km Southeast	16 turbines	Planning Permit Application lodged and process underway
Brewster Wind Farm	27 km North	7 turbines	Planning Permit Application lodged and process underway

Table 14: Summary of nearby Wind Farm Projects

***Note: Information available on DTP (formerly DELWP) Permits and Applications Database accessed May 2023 (DELWP, 2020).**

9.3 Cumulative Impact on the Broader Landscape Character and Surrounding Dwellings

The Victorian Government has identified six (6) key Renewable Energy Zones (REZ) in the State's South West, Western, Central North, Murray River, Ovens Murray and Gippsland regions. The Project is located within the extents of the land defined as the Western Victoria REZ. The existing landscape character of the region allows for optimum harvest of wind energy due to the flat to gently undulating topography and minimal obstructions in the landscape. These characteristics are beneficial to the output of wind energy and it is inevitable that overtime this will be utilised for the development of wind farm projects.

The re-occurrence of wind farms within a region has the potential to alter the perception of the overall landscape character irrespective of being viewed in a single viewshed. As wind farm developments prevail it is important to determine whether the effect of multiple wind farms and other major infrastructure within the region would combine to become the dominant visual element, altering the perception of the general landscape character.

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

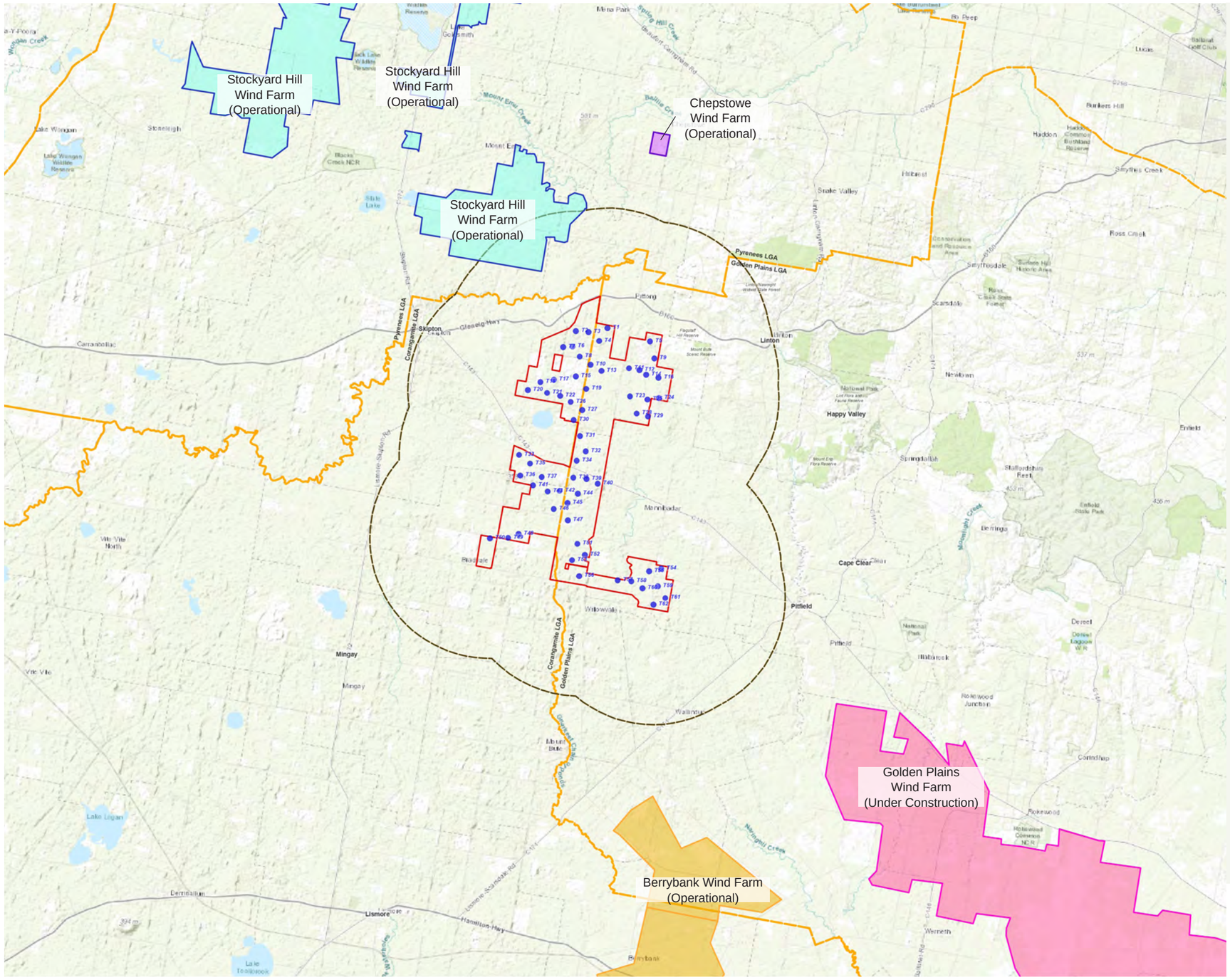
The Project is located on a flat to gently undulating terrain that is surrounded by scattered dwellings. **Section 7.0** of this report highlights that some dwellings near the Project are surrounded by moderate to dense vegetation which will help limit views of the Project. It is, therefore, highly likely that the impact on majority of the private viewing locations will be limited. The cumulative visual impacts of the surrounding wind farms is likely to be experienced from some public locations within the Study Area. For example, locations along Glenelg Highway are likely to have simultaneous views of the Project and Stockyard Hill Wind Farm and Chepstowe Wind Farm.

With the construction of upcoming wind farms such as Golden Plains Wind Farm, and with Stockyard Hill Wind Farm, Chepstowe Wind Farm and Berrybank Wind Farm already in operation, the landscape character is likely to change from an agricultural landscape to an agricultural landscape with wind energy as an intermittent yet defining character element. The addition of Moreton Hill Wind Farm is likely to be viewed as an extension of the existing wind farm projects that are operational and under construction.

The maximum tip height of turbines associated with Stockyard Hill Wind Farm is 180 m and maximum tip height of turbines associated with Golden Plains Wind Farm is 230 m. The proposed maximum tip height for the Project is 252 m. Due to scale and distance of turbines, it is likely that the height difference will not have significant impacts on the existing visual character which is defined by a landscape utilised for wind energy production.

With the development of wind farm projects in the area, it is also important to consider the cumulative impacts of ancillary infrastructure such as transmission lines. **Figure 20** shows the existing Western Victorian Transmission Network and **Section 10.0** of this report discusses the potential visual impacts of ancillary infrastructure associated with the Project. It is proposed that the Project will connect to the existing transmission network via a 220 kV underground transmission line to the existing Berrybank Terminal Station (refer to **Section 10.3.2**), and therefore, it is likely that the overall visual impact of the proposed connection will be low to nil.

Figure 20: Renewable Energy Zones of Victoria (Source: AEMO 2021)



Cumulative Visual Impacts

Moreton Hill Wind Farm

LEGEND

- Proposed 252 m Turbine Location (Moreton Hill Wind Farm)
- Project Area
- 6,000 m from nearest turbine
- LGA Boundary

Figure 21: Cumulative Visual Impacts (Map Source: ESRI 2023)

10

Associated Infrastructure

10.0 Associated Infrastructure

10.1 Overview of Associated Infrastructure

In addition to the proposed wind turbines, the associated infrastructure is likely to contrast with the existing visual landscape. Due to the large scale and gently undulating topography of the Project Site, it is likely that access roads and other ancillary structures have the potential to alter the existing visual landscape. An overview of the potential visual impact resulting from associated infrastructure and Project components is provided in this section of the report.

10.2 Access Roads

Access roads are proposed on site between the wind turbines. The Project will be access via the Glenelg Highway and Rokewood - Skipton Road and the following secondary local roads. The Project has been designed to minimise site entry points from major roads. Entry points are located at:

- Corner Rankin Rd and Rokewood Road
- Rokewood Road / Stretches Road
- Spring Hill Road/Notmans Road
- Spring Hill / Funston Road
- Pittong- Lismore Road / Francis Lane
- Pittong- Lismore Road / Parkers Road
- Mt Bute / Parkers Road

Intersections of the Glenelg Hwy/Spring Hill Road, Rokewood /Spring Hill Road/Notmans Road, Rokewood / Stretches Road and Rokewood/ Pittong-Lismore roads already have existing pavement and turning lane configurations to accommodate terminal station and wind turbine component delivery. The Project will require minor upgrades to approximately 10.5 km of local minor roads and five (5) intersection upgrades off the Rokewood Skipton / Pittong-Lismore / Mt Bute Roads.

Access for maintenance of the Project will be via private access roads as per the preliminary design layout. Upgrading/constructing access tracks, involving land/vegetation clearance and removal and stockpiling of topsoil for future use, excavation, filling, laying bedding materials and track surface materials. Access tracks will be upgraded/constructed to a trafficable width of approximately 5.5 m plus shoulders and drainage. The associated infrastructure would be integrated, where possible, with existing land parcels suitable for accommodating infrastructure amenities that could be accessed via existing roads in the Project. Where possible, the internal road network will be aligned on the route of existing farm or other access roads with localised widening where required to support transportation of the WTG components.

The arrangement of access tracks has been designed to minimise the removal of native vegetation where possible and to minimise the length of access track required.

Due to the existing agricultural land use of the Study Area, farm roads traversing the landscape form a significant part of the existing landscape character. The proposed access roads are likely to be viewed as part of the existing character of the landscape and therefore visual impact would be low.

Mitigation measures for reducing residual visual impact resulting from the construction of access roads include:

- *Where possible utilise or upgrade existing roads, trails or tracks to provide access to the proposed turbines to reduce the need for new roads.*
- *Allow for the provision for downsizing roads or restoring roads to existing condition following construction where possible.*
- *Any new roads should minimise cut and fill and avoid the loss of vegetation.*
- *Utilise local materials where possible and practical.*

10.3 Transmission Lines

10.3.1 Internal Transmission lines

Each of the WTG clusters will be internally connected to an on-site substation via predominantly underground reticulation cabling. It is anticipated that connections will be predominantly be via underground cables. A small section (approximately 650 m) of overhead reticulation is proposed for the crossing of Naringhil Creek between turbine 57 and 58, which will require four overhead poles. This is to avoid direct potential impacts on the creek that would be associated with construction of underground cabling such as sedimentation from trenching works. Approximately 57 km of underground cabling between turbines will be required.

Cable alignments have been chosen to run parallel to new tracks and parallel with other cables where alignments coincide and to avoid native vegetation impacts where possible. The specifications of the electrical cables will be addressed as part of the detailed design stage, and considered as part of the LVIA.

The proposed underground reticulation would not alter the existing visual landscape and therefore visual impact would be negligible. The small section over Naringhil Creek would be viewed as part of the existing visual character of the area and therefore result in a negligible visual impact.

10.3.2 External Transmission lines

The Project will connect to the 220 kV Ballarat to Terang transmission line at the existing Berrybank Terminal Station via a new 220 kV underground transmission line. The proposed 220 kV underground transmission line extends from the onsite substation to the south of the wind farm boundary, east along Lismore-Pittong Road, and then runs south along Willowvale Road. From there, it travels south-west adjacent to the Ballarat to Terang 220 kV transmission line and connects into Berrybank Terminal Station.

The overall length of the underground transmission line is approximately 14 km, however only 9.5 km of the line is external to the wind farm site, south of Lismore-Pittong Road. The underground transmission line would consist of a single circuit arrangement with cable pits located every 1 km. Construction would have temporary visual impacts associated with trench digging along the course of the transmission line.

Figure 22 provides an overview of the potential visual impacts resulting from the ancillary structures that will be required to manage the Project operations.

Proposed mitigation methods to be considered during detailed design phase for any potential transmission line connections include:

- *Utilise existing transmission lines where possible.*
- *The route for any proposed overhead transmission lines should be chosen to reduce visibility from surrounding areas.*
- *Plan route to minimise vegetation loss.*
- *Use of subtle colours and a low reflectivity surface treatment on power poles to ensure that glint is minimised.*

10.4 Ancillary Structures

10.4.1 Substation and Battery Energy Storage System (BESS)

One new substation is proposed that will incorporate a control building, high voltage electrical infrastructure and metering and control equipment as required by the Network Service Provider. The footprint of the substation is approximately 1.5 hectare (ha). The BESS will be located adjacent to the onsite substation and will cover an area up to 2 ha and have a storage capacity of 150 MW and include water storage facilities in line with CFA requirements. The substation and BESS compound is located within the Project and set back from nearby dwellings and major transport corridors. The proposed location for the compound is at the intersection of Hendersons Road and Rankin Road in the central and southern part of the Project Area. A 10 m buffer is proposed around the compound which can allow the provision of screen planting, if required.

It is unlikely that the substation and the BESS would be visible from moderate use roads such as Rokewood - Skipton Road, Lismore-Pittong Road and Crawfords Road. If deemed necessary during the detailed design phase, screen planting could be employed to reduce any potential visual impacts within the extents of the 10 m buffer. Views in the southern and western directions are likely to be distant and screened by existing vegetation on farm lots, resulting potentially in a low visual impact.

10.4.2 Site Concrete Batching Boxes (temporary construction facilities)

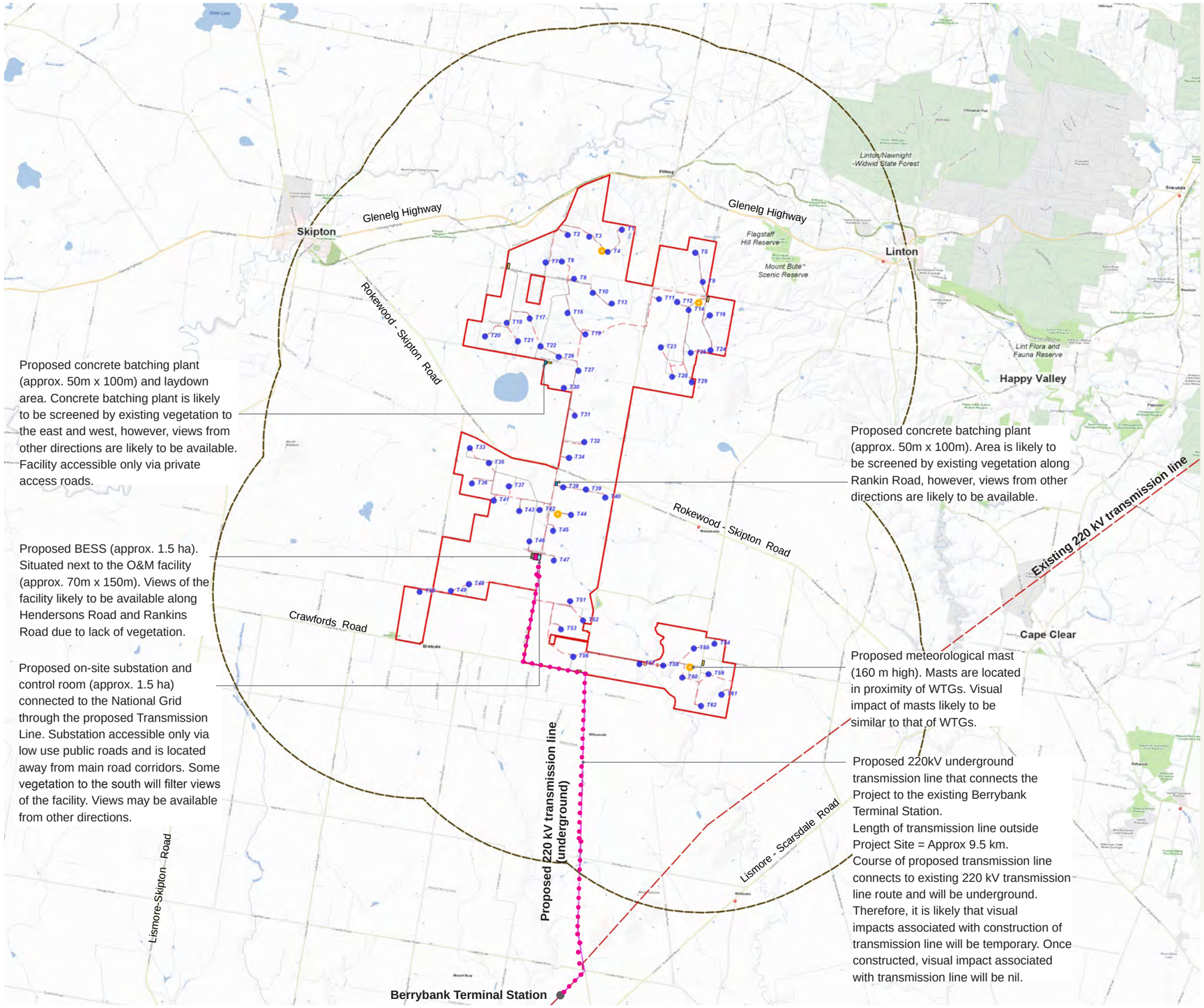
Two temporary concrete batching plants are proposed to be located within the wind farm site, one located north of the existing quarry below Notmans Road and one south of Rokewood-Skipton Road on Rankin Road as shown in **Figure 22**.

It is intended that the existing quarry adjacent to the Project site on Rokewood-Skipton Road will be used to supply stone resource for the construction of the turbine hardstands and road base material for access track upgrades, laydown areas, batching plant surfaces, operation and maintenance areas.

10.4.3 Meteorological Masts and Site Office Compound

The wind farm would also have up to four (4) permanent 160 m high meteorological monitoring masts. The four masts are located in the northern and southern parts of the Project Area. The masts are proposed close to the turbines, and hence, the resulting visual impact is likely to be similar to the impacts associated with the turbines.

A site office compound including operation and maintenance facilities is proposed. The site office compound would be located adjacent to the substation, across Rankin Road and accessed via Hendersons Road.



Associated Infrastructure

Moreton Hill Wind Farm

LEGEND

- Project Boundary
- Proposed 252 m Turbine Location (Moreton Hill Wind Farm)
- Proposed Access Roads
- Proposed Internal MV Reticulation
- Proposed Transmission line connection to Berrybank Terminal Station
- Existing 220 kV transmission line
- Proposed 160 m high meteorological masts
- Proposed Laydown Areas
- Proposed Batching Plant
- Proposed Site Office
- Proposed BESS
- Proposed Substation

N

0 2 4 6 8 10km

Figure 22: Overview of potential visual impact of Associated Infrastructure (Map Source: VicPlan 2023)

10.5 Mitigation Methods for Associated Infrastructure

All elements of the ancillary infrastructure have been sited in areas that are currently utilised for grazing and are devoid of any vegetated woodlands, thus eliminating the need for significant removal of existing vegetation. The proposed sites are surrounded by tracts of existing roadside vegetation which will help limit views towards these sites. If deemed necessary, the ancillary infrastructure can be screened through the provision of mitigation planting. The following mitigation measures would assist in reducing any residual visual impacts:

- *Siting to ensure minimal vegetation loss.*
- *Screen planting to further reduce any residual visual impacts.*
- *Consideration should be given to controlling the type and colour of building materials used. Where possible a recessive colour palette is to be used which blends into the existing landscape*
- *Avoidance of unnecessary lighting, signage on fences, logos etc.*
- *Any proposed buildings to be sympathetic to existing architectural elements in the landscape.*
- *Minimise cut and fill and loss of existing vegetation throughout the construction process.*
- *Boundary screen planting is an effective mitigation method which could be utilised to ameliorate potential visual impacts resulting from the construction of ancillary structures with a small vertical scale such as collector substations, switching stations and the operations facilities building.*

11

Mitigation Recommendations

11.0 Mitigation Recommendations

11.1 Overview of Mitigation Methods

This section of the report provides recommendations which seek to achieve a better visual integration of the Project and the existing visual character at both local and regional scales. The mitigation measures attempt to lessen the visual impact of the proposed wind farm whilst enhancing the visual character of the surrounding environment.

Mitigation measures are best considered as two separate phases. These include:

- Primary measures that form part of the development of the wind farm design through an interactive process; and
- Secondary measures designed to specifically address the remaining (residual) negative (adverse) effects of the final development proposals (The Landscape Institute et al 2008).

It is important to note that the mitigation methods proposed in this report are made notwithstanding issues raised by other consultants (eg. engineering, ecology, geology etc.). During the planning and design phase of a wind farm mitigation strategies should also be considered to lessen the visual impact of the proposal. This is by no means an exhaustive list, however the adoption of these recommendations will assist considerably in minimising potential visual impacts of the Project.

Mitigation methods considered for associated infrastructure have been included in ***Section 10.0***.

11.2 Project Layout and Design

The design of the proposed wind farm is the primary means of mitigation. The general principles employed through the project design phase can significantly reduce the visual impact. These include siting, access, layout and other principles which directly impact the appearance of the proposed development. General guidelines for the design development of the Project have been outlined in the following section.

11.2.1 Wind Farm Layout and Size

The layout and size of the wind farm is a significant factor in the visual impact on the landscape. According to Stanton (1995) the intrusiveness of a wind farm is not directly proportional to the number of turbines in an array, but rather, more a factor of design and layout. For example, large wind farms may appear less dominating than a smaller project when the large wind farm is subdivided into several visually comprehensible units.

It is suggested that fewer and more widely spaced turbines present a more pleasing appearance than tightly packed arrays (Urbis, 2009). The following principles should guide the design process of the wind farm:

- Controlling the location of different turbine types, densities and layout geometry to minimise the visual impacts.
- The lines of turbines should reflect the contours of the natural landscape as best as possible.
- Ensure the turbines are evenly spaced to give a regular pattern creating a better balance within the landscape.
- Consideration of surrounding wind farm projects (including the layout and size of turbines) to ensure consistency in the project layout and turbine design in instances where projects are views concurrently.

11.2.2 Wind Turbine Design and Colouring

Turbine design and colouring are an important factor. The turbines will have a matte white finish and consist of three blades which is consistent with the current turbine models being considered.

The important factors to achieving a visual consistency through the landscape include:

- Uniformity in the colour, design, rotational speed, height and rotor diameter.
- The use of simple muted colours and non-reflective materials to reduce distant visibility and avoid drawing the eye.
- Blades, nacelle and tower to appear as the same colour.
- Avoidance of unnecessary lighting, signage, logos etc.

11.3 Off-site screen planting - Residences

In circumstances where residences are subject to a moderate or high level of visual impact, off-site screen planting is an option proposed to assist in mitigating views of turbines from residential properties. As the viewing location of the proposal would be generally fixed there is opportunity to significantly reduce potential visual impact from the Project.

In order to achieve visual screening planting between the intrusive element and the homestead, tree planting could be undertaken in consultation with the relevant landowners to ensure that desirable views are not inadvertently eroded or lost in the effort to mitigate views of the turbines.

An example of how screen planting could be used to mitigate potential views towards visible turbines from **Dwelling 3** (Refer to **Figure 23**). Note this is an example only and a detailed analysis would be required to determine the extent of visibility, existing planting and orientation of the residence.

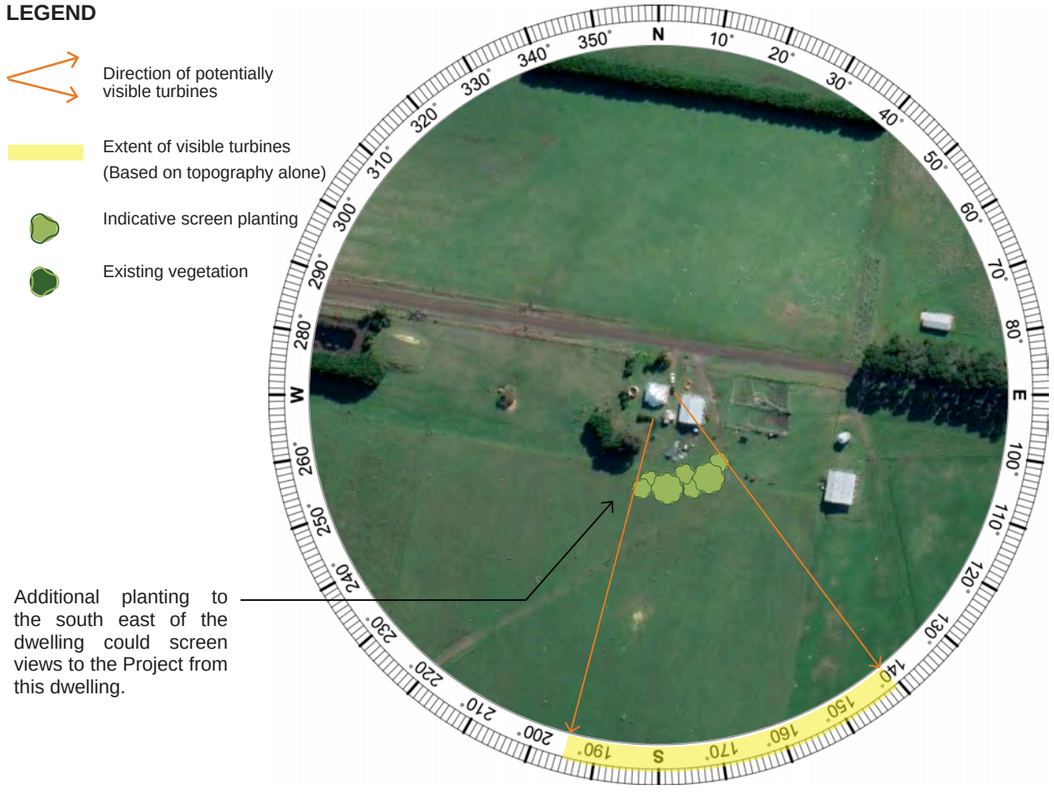


Figure 23: Example of on-site screen planting at dwelling (Map Source: Google Earth)

11.4 Off-site screen planting - Roadside

In circumstances where there is the potential for a moderate or high level of visual impact from public viewing locations, roadside planting in keeping with the existing landscape character of the area could be undertaken to assist in mitigating impacts. These measures are addressed for key public viewpoints, if required, in the detail design phase.

Image 37 Example of roadside vegetation, typical of the area

11.5 Landscaping Principles

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

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

Locally native plant species are preferred, as they help to preserve the landscape character and scenic quality of the area as well as building habitat for local fauna. Native species are also well-suited to local conditions (ie. soil, climate, etc.) and will build on the existing vegetation assemblages in the area.

12

Summary of Findings

12.1 Summary of Findings

This PLVIA report has been undertaken to accompany a referral under the Environment Effects Act 1978 and is based on the guidelines set by the *Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria* (revised September 2023). The following provides a brief summary of the PLVIA and outlines the steps that will be undertaken in the Landscape and Visual Impact Assessment (LVIA) which will be undertaken as part of the next phases of the project approvals.

Existing Landscape Character

This PLVIA provided a detailed assessment of the existing landscape character of the Study Area through the following:

- Identified land uses, key landscape features and key viewpoints,
- Categorisation of six (6) preliminary Landscape Character Units (LCUs),
- A brief preliminary overview of the potential visual impacts has been provided for each LCU.

Zone of Visual Influence

A Zone of Visual Influence (ZVI) has been prepared to illustrate the theoretical visibility of the Project and to assist in defining the visual catchment. A Preliminary ZVI have been prepared from the blade tip height of 252 m to illustrate areas which have potential visibility of the Project.

Next Steps:

- The LVIA will require further detailed assessment from areas identified as having potential visibility in the Preliminary ZVI.
- Graphic representations of the Project from public receptor locations have been included in this assessment.
- Further graphic representations of the Project using GIS technology including wire frame diagrams and photomontages will be provided for private receptor locations in the next phases of project approvals.

Public Viewpoint Analysis

Assessment of potential visual impact on public viewing areas across the Study Area was carried out for 25 public viewpoints. These viewpoints were taken from varying distances and locations. The following results were identified:

- 12 public viewpoint locations were assessed as having a Low visual impact rating.
- Six (6) public viewpoint locations were assessed as having a Moderate-Low visual impact rating.
- Six (6) public viewpoint locations were assessed as having a Moderate visual impact rating.
- One (1) public viewpoint location was assessed as having a High visual impact rating.

Next Steps:

- Identify any additional key features, key viewpoints valued by the community through ongoing consultation during the development approvals process.
- Determine the impact on various viewing locations and measures for mitigating impact on the key viewing locations identified through community consultation.

Dwelling Analysis

A desktop assessment of all non-involved dwellings found that majority of dwellings are likely to have limited views to the Project due to existing dense wind break planting and structures that surround the dwellings. The following provides a summary of dwellings that were assessed:

- 20 non-involved dwellings are located within 2,000 m of the nearest turbine. 15 of these are surrounded by dense screening vegetation and / or structures.
- 68 non-involved dwellings are located within 2,000 - 4,000 m of the nearest turbine. 54 of these are surrounded by dense vegetation and / or structures.
- 42 non-involved dwellings are located between 4,000 - 6,000 m of the nearest turbine. 32 of these are surrounded by dense vegetation.
- 11 non-involved dwellings are located outside 6,000 m of the nearest turbine. 10 of these are surrounded by dense vegetation or intervening structures.

Representative dwelling assessments have been undertaken for four (4) non-involved dwellings within 2,000 m of the nearest turbine, five (5) non-involved dwellings within 2,000 - 4,000 m of the nearest turbine and six (6) non-involved dwellings within 4,000 - 6,000 m of the nearest turbine. An overview of the visual assessment for these dwellings has been included in **Appendix A**.

Next Steps:

- Conduct detailed dwelling assessments by preparing photomontages and wire frame diagrams from key viewing locations around the dwelling. This would be undertaken during approvals phase.
- Determine the visual impact and measures for mitigating views from dwellings.

Cumulative Visual Impacts of Surrounding Wind Farms

The Project is located within Western Victoria REZ and is potentially located in proximity of four (4) other wind farms (Stockyard Hill Wind Farm, Chepstowe Wind Farm Berrybank Wind Farm and Golden Plains Wind Farm). It is important that the Project considers potential cumulative effects on the immediate and broader regional context that it forms a part of.

Next Steps:

- Conduct detailed assessments by preparing photomontages and wire frame diagrams from key public viewing locations that are likely to be impacted by surrounding wind farm projects. This would be undertaken during approvals phase.
- Determine the visual impact on these locations in relation to the existing character of the area.

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