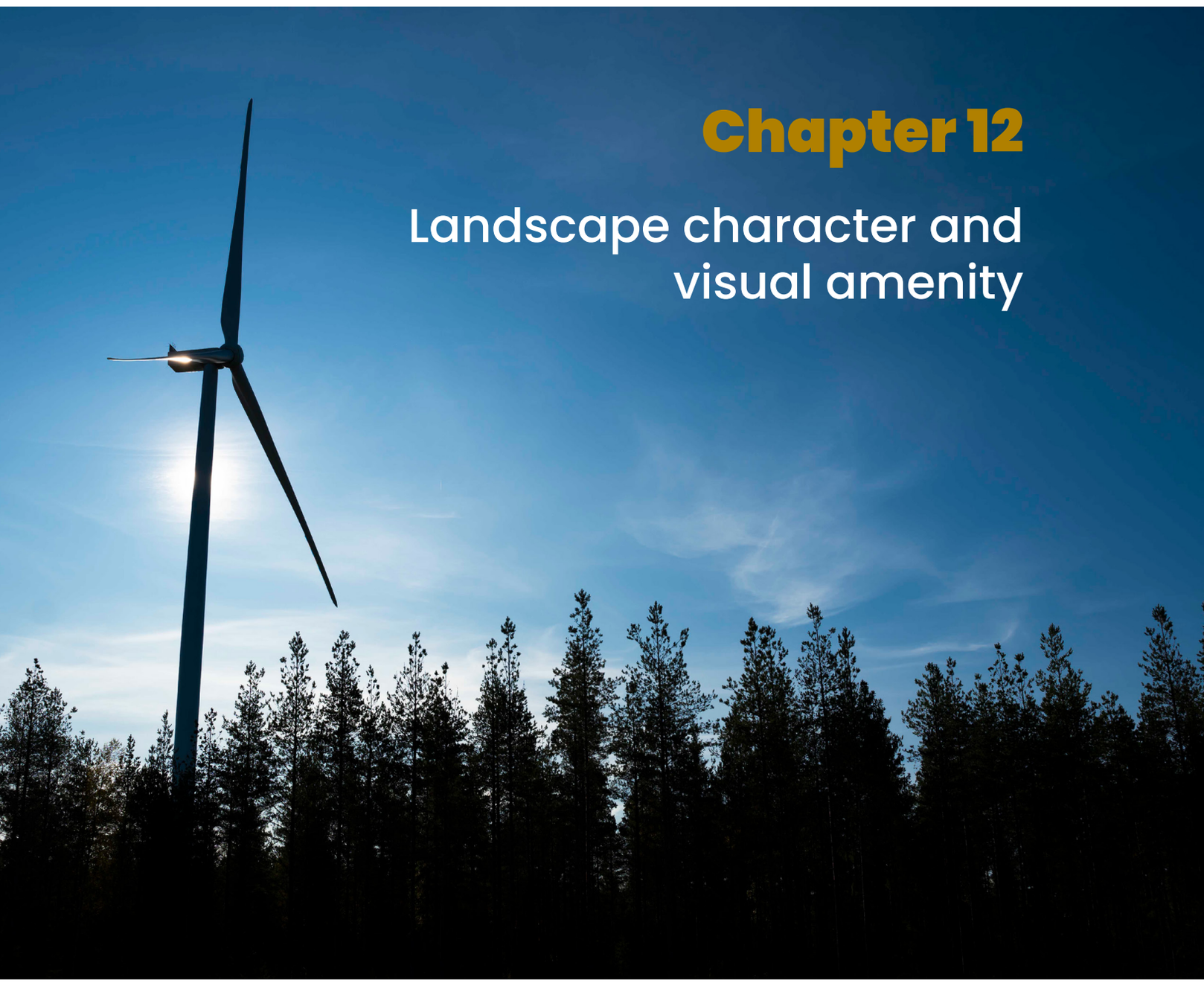

Chapter 12

Landscape character and visual amenity

Acknowledgement of Country

Neoen Australia acknowledges the traditional custodians of the land in which we live, and pays its respects to their elders, past and present. The Gunditjmara are the original custodians of the Country on which the Project is located and we acknowledge them as the original custodians. We are committed to Aboriginal engagement and reconciliation and aim to bring Aboriginal and Torres Strait Islander people, local communities and the councils along for the journey to strengthen relationships and enhance local community outcomes.

Disclaimer

12 Landscape character and visual amenity

This chapter describes the potential impacts on landscape character and visual amenity associated with the construction, operation and decommissioning of the Project, as well as the mitigation measures proposed to avoid, minimise, and manage potential adverse impacts.

This chapter summarises the outcomes of the following technical reports:

- Landscape and Visual Impact Assessment (LVIA) (**Appendix L**)
- Shadow Flicker and the Blade Glint Assessment (**Appendix M**).

12.1 Overview

A **Landscape and Visual Impact Assessment (LVIA) (Appendix L)** has been prepared for the Project in accordance with relevant policy and guidelines and best practice guidance. The assessment has considered the potential landscape effects of the Project on landscape character and protected landscapes, as well as potential visual effects on the visual amenity of people living, travelling through, and visiting places of interest for recreation and tourism within the landscape surrounding the Project. The potential cumulative landscape and visual effects of the Project have also been considered.

Summary of potential landscape character effects

The assessment of potential landscape character effects considered seven landscape character areas (LCAs) within the Project viewshed. LCAs were informed by the Coastal Spaces Landscape Assessment Study (Planisphere, 2006) and defined based on topography, landform, vegetation, land use and settlement. The assessment found that overall, the landscape within the Project viewshed has a Moderate to High sensitivity to accommodate change, and the Project would generally be acceptable within the viewshed landscape. Areas with a High sensitivity to development were identified in some locations, including along the coastal edge of Discovery Bay Coastal Park south of the Project Area. The assessment found that the Project would not be inconsistent with the objectives of the Significant Landscape Overlay (SLO) where it intersects along the western edge of the Project Area.

Summary of potential visual effects

The assessment of potential visual effects considered views of the Project from key public view locations, including towns, natural areas, lookouts and roads. There would be no significant visual effects for most key view locations. Public view locations assessed as being susceptible to potentially High visual effects were:

- Lake Mombeong campsite, lakes, and swamps
- Sections of the Lake Mombeong inland track
- Lake Mombeong lookout and Hedditch Hill Scenic Reserve lookout.

Potential visual effects on 50 non-involved dwellings (private view locations) within 10 km of the wind turbines were also assessed. Most dwellings were assessed as potentially experiencing a Moderate to Negligible level of visual effect. Five dwellings were assessed as potentially experiencing a High visual effect, and a further two dwellings were assessed as potentially experiencing a Moderate to High visual effect.

Summary of proposed mitigation

The Project's turbine layout has been refined in response to the potential visual impacts on these key view locations and other adjoining receiver types. This has included setting back turbines from the Lake Mombeong Campground and removing turbines to maintain visual connectivity of ocean views from the Hedditch Hill Scenic Reserve area. Further consultation with Parks Victoria and Great South West Walk (GSWW) committee will be undertaken to investigate and implement potential mitigation to minimise visual effects on key public view locations. These might include additional planting strategies to increase screening at specific view locations and/or to install/upgrade existing infrastructure at these locations to improve the sites as a way to offset potential impacts.

Soft landscape works (tree and shrub planting) will be installed at non-involved dwellings within 10 km of wind turbines where the Project would result in Moderate to High to High visual effects. The location and design of landscape screening is site specific and will require detailed analysis of potential views and consultation with potentially affected landowners.

Views toward electrical infrastructure, including the collector substations, main substation and overhead cabling throughout the wind farm site would tend to be limited to the Portland Nelson Road corridor. Existing tree cover and within and beyond the plantations would mitigate the extent and level of visual impact. However, electrical infrastructure and associated buildings and structures would be designed to have non-reflecting surface finishes and appropriate colour finishes that considers the existing visual backdrops.

Summary of shadow flicker and blade glint effects

Worst case modelling undertaken for the Project determined that shadow flicker is likely to exceed 30 hours per year at two involved dwellings (receivers 21 and 675). Neoen Australia Pty Ltd (the Proponent) has agreements in place with these landowners who acknowledge and accept this exceedance.

Blade glint was assessed as being unlikely to cause significant effects on receivers and there is industry-standard mitigation that will ameliorate any potential impacts. Wind turbine blades will be finished with a surface treatment of low reflectivity coating to ensure that glint is minimised.

12.2 EES evaluation objective

The specific environmental matters to be investigated and documented in the Project's EES are set out in the S*coping Requirements for Kentbruck Green Power Hub Environment Effects Statement* (Scoping Requirements). The Scoping Requirements provide evaluation objectives that describe the desired outcomes to be achieved for each of the matters being addressed in this EES.

The following draft evaluation objective is relevant for the LVIA, and Shadow Flicker and Blade Glint impact assessments:

> ***Landscape and visual -*** *To minimise and manage potential adverse effects on landscape and visual amenity.*

This chapter and the associated technical assessments (**(LVIA (Appendix L)** and **Shadow Flicker and Blade Glint Assessment (Appendix M))** address the Project's landscape character and visual amenity matters in response to the Scoping Requirements.

12.3 Assessment methodology

12.3.1 Landscape and visual

The following approach was taken for the Landscape and Visual Impact Assessment:

- Characterisation of the landscape character, features and values of the Project Area and surrounds, including preparation of panoramic and aerial photographs and Zone of Theoretical Visibility (ZTV) diagrams.
- Identification of nearby dwellings and public and private viewsheds (communities, public lookouts, tourist attractions, roads, key vantage points) to and from the Project.
- Site inspection works and photography were undertaken in March 2019, February 2021, September 2021, July and August 2022 and February 2023.
- Identification and assessment of potential impacts on significant landscape values, nearby dwellings and public view locations within the vicinity of the Project because of construction and operation of the Project.
- Assess the potential for cumulative effects associated with the Project in the context of existing built infrastructure, as well as nearby operational and proposed/approved wind farms or other developments.
- Development of mitigation measures to avoid, minimise and manage potential impacts.
- Assessment of the residual visual impacts with the implementation of mitigation measures.

12.3.1.1 Existing conditions

Viewshed

The viewshed for the Project is the geographic area surroundings the Project Area where views towards key Project elements (wind turbines, overhead powerlines, substation) may be visible. Viewsheds can extend for long distances beyond wind farm project sites across mixed use areas including large tracts of unoccupied agricultural or natural landscapes. Viewsheds may include a range of key public and private view locations subject to High, Moderate, or Low visual effects. The extent of viewshed is influenced and informed by several criteria including the height of the wind turbines together with landscape features that may limit and influence the extent of wind farm visibility.

Key view locations (including public and private) were then identified within the viewshed. This included non-involved dwellings, public lookouts, tourist attractions, roads, and key vantage points.

Existing landscape

The existing landscape within the viewshed was characterised through a desktop review of:

- Victorian State Planning Policy Framework (PPF)
- Local Planning Policy Framework – Glenelg Planning Scheme (the Planning Scheme), in particular, SLOs

- Policy and Planning Guidelines - Development of Wind Energy Facilities in Victoria (DTP, 2023)
- Marine and Coastal Act 2018 (Vic)
- Coastal Spaces Landscape Assessment Study (Department of Sustainability and Environment, 2006)
- South West Landscape Assessment Study (Department of Planning and Community Development, 2013).

Landscape character areas

As part of the LVIA process it is important to understand the nature and sensitivity of different components of landscape character to determine the potential for impacts from the Project. The LVIA identified LCAs within the Project viewshed, which were predominately informed by the Coastal Spaces Landscape Assessment Study (Planisphere, 2006). LCAs were defined based on topography, landform, vegetation, land use and settlement.

A landscape character assessment was then undertaken to determine the degree of landscape sensitivity for each LCA. Landscape sensitivity is considered the ability of a landscape to absorb visual change based on attributes of a particular landscape. The landscape sensitivity for each LCA was determined based on the existing use of the area and the degree to which the landscape can accommodate further change. This was determined using several criteria, including landform and scale, landcover, settlement and human influence, movement, rarity and intervisibility.

Table 12.1 outlines the sensitivity ratings used to assess the landscape sensitivity of each LCA.

Table 12.1 Landscape sensitivity ratings

Sensitivity rating	Description
High	Where key characteristics of the landscape may be impacted on by the Project and could result in major and visually dominant alterations to perceived characteristics of the LCA, which may not be fully mitigated by existing landscape elements and features. The degree to which the landscape may accommodate the Project would result in several perceived uncharacteristic and significant changes.
Medium	Where distinguishable characteristics of the LCA may be altered by the Project, although the LCA may have the capability to absorb some change. The degree to which the LCA may accommodate the proposed Project would potentially result in the introduction of prominent elements to the LCA, which may be accommodated to some degree.
Low	Where the majority of the LCA characteristics are generally robust and would be less affected by the Project. The degree to which the landscape may accommodate the Project would not significantly alter existing landscape character.
Negligible	Where the characteristics of the LCA would not be impacted on or visibly altered by the Project.

12.3.1.2 Impact assessment method for assessing visual effects

Potential visual effects for a view location were determined using a combination of receiver sensitivity and the magnitude of visual effects. This is a well-established methodology and has been applied extensively on wind farm LVIA's in Victoria and across Australia.

The sensitivity of visual receivers considered what people would be doing when they experience the view and the extent to which their attention or interest is focussed on views within and surrounding the Project.

To determine the magnitude of visual effects, the following was considered:

- The scale of the change in view with respect to the loss or addition of features in view and changes in its composition, including the proportion of the view occupied by the Project.
- The degree of contract or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line height, colour, and texture.
- The nature of the view of the proposed development, in terms of the relative amount of time over which it would be experience and whether views would be full, partial or glimpses.

The combination of sensitivity (**Table 12.2**) and magnitude (**Table 12.3**) provides the rating of visual effects for view locations. An overall determination of visual effect at each receiver location has been assessed using the visual impact grading matrix outlined in **Table 12.4**, to provide a visual effect rating.

The levels of sensitivity and magnitude of visual effects outlined in **Table 12.4**, have been used as a guide to determine levels of visual effect and are not absolute. Whilst a receiver location may have both a High sensitivity and High magnitude, which will result in a High visual effect, the visual effect may be offset and mitigated by screening, through tree cover or intervening landform surrounding or beyond the receiver location.

Table 12.2: Level of sensitivity criteria

Sensitivity of visual receiver	
High	People with a proprietary interest and prolonged viewing opportunities such as those in dwellings or visitors to attractive and/or well-used recreational facilities. Views from a regionally important location whose interest is specifically focussed on the landscape e.g., from lookouts or areas within National and/or State Parks.
Moderate	People with an interest in their environment e.g., visitors to environmental areas, bush walkers, and horse riders etc., those travelling with an interest in their surroundings.
Low	People with a passing interest in their surroundings e.g., those travelling along local roads between townships, or people whose interest is not specifically focussed on the wider landscape e.g., service providers or commuters.
Negligible	People with no specific interest in their surroundings or those with occasional and transient views travelling at speed along highways or from a place of work where attention may not be focussed on surrounding views.

Table 12.3: Magnitude of visual effects criteria

Scale or magnitude of visual effects	
High	Very short distance view over a long duration of time. A high extent of wind turbine visibility would tend to dominate the available skyline view and significantly disrupt existing views or vistas. Total loss or major change to pre-development view or introduction of elements which are uncharacteristic to the existing landscape features.
Moderate	Short to medium distance views over a medium duration of time. A moderate extent of wind turbine visibility would have the potential to dominate available views with visibility recessing over increasing distance. Partial alteration to predevelopment view or introduction of elements that may be prominent but not uncharacteristic with the existing landscape.
Low	Medium to long distance views over a low to medium duration of time. Wind turbines in views, at long distances or visible for a short duration not expected to be significantly distinct in the existing view. Minor alteration to pre-development view or introduction of elements that may not be uncharacteristic with the existing landscape.
Negligible	Visible change perceptible at a very long distance, or visible for a very short duration, and/or is expected to be less distinct within the existing view. Very minor loss or alteration to pre-development view or introduction of elements which are not uncharacteristic with the existing landscape features.

Table 12.4: Visual effect grading matrix

		Scale or magnitude of visual effects			
		High	**Medium**	**Low**	**Negligible**
Sensitivity of visual receiver	**High**	High	High-moderate	Moderate	Negligible
	Medium	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

12.3.2 Shadow flicker and blade glint

The following approach was undertaken for the shadow flicker and blade glint impact assessment:

- Identification of dwellings within proximity to the Project that have potential to be affected by shadow flicker and blade glint.
- Model potential shadow flicker from the Project based on the maximum turbine dimensions being considered for the Project (considered the worst-case scenario for shadow flicker) and dwelling locations using the EMD WindPRO 3.5 software package.
- Calculate shadow flicker at nearby affected dwellings using both 'worst case' and realistic 'expected case' results.
- Identify dwellings where shadow flicker exceedance is modelled to occur and determine appropriate mitigation where required.
- Implement mitigation measures according to relevant policy and regulations to minimise potential blade glint impacts on nearby dwellings.

12.4 Existing conditions

12.4.1 Study area

The LVIA established a viewshed for the Project, which is defined as a geographic area that surrounds the Project Area, where key Project infrastructure may be visible from view locations and result in a Moderate to High visual effects. The viewshed considered wind turbines, overhead cabling throughout the wind farm site and collector substations as key infrastructure due to their potential visibility and visual effect on surrounding locations.

To determine and assess potential visual effects of the Project, the following four offset distances were adopted for the LVIA:

- Zone of Visual Influence Visibility diagrams of up to 20 km from the wind turbines.
- Identification of named lookouts up to 20 km from the wind turbines.
- Assessment of key private view locations up to 10 km from the wind turbines.
- Identification of other wind farm projects up to 60 km from the Project Area.

These landscape features and designations are shown in **Figure 12.1.**

The extent of viewsheds generally vary depending on criteria such as turbine height and the nature, location and height of landform or vegetation, which can influence the visibility of wind farms. For areas surrounding the Project Area, landforms are defined by varying heights and extensive forests, pine plantations and National Parks, which provides various degrees of screening, that reduces significant visual effects beyond 20 km from the wind turbines.

Wind turbines can be visible from landscape areas (and ocean) far beyond 10 km (and up to 50 km in ideal viewing conditions). However, when considering the general parameters of normal human vision, wind turbines with a height of 270 m (as proposed for the Project) would occupy a relatively small proportion of a person's field of view from distances more than 10 km. As such, there is a relatively lower level of perceived visual effects especially when tree cover across agricultural land, within National Parks and plantations is located between the wind turbines and visual receiver.

Legend

- Proposed Turbine Location
- Electrical Substation
- Underground Transmission Line
- Wind Farm Site
- Distance from Project
- Township
- Great South West Walk
- Roads
- Watercourses
- Existing Overhead Transmission Lines
- Parks and Reserves
- 2km Wind Turbine Viewshed

Image Source: ESRI Basemap (2022) Data source: DELWP (2021)

FIGURE 12.1

Project viewshed and locality features

12.4.2 Significant Landscape Overlays

Three SLOs under the Planning Scheme are present within and in the vicinity of the Project Area. The only SLO which applies to the Project Area is Significant Landscape Overlay – Schedule 1 (SLO1). These SLOs were incorporated into the Glenelg Planning Scheme via planning scheme amendment C52 Part 1. The introduction of the SLOs into the planning scheme gives statutory effect to the *Coastal Spaces Landscape Assessment Study 2006* (DSE, 2006).

12.4.2.1 Significant Landscape Overlay – Schedule 1

Significant Landscape Overlay – Schedule 1 (SLO1) under the Planning Scheme applies to land at the western end of the Project Area. This planning overlay identifies areas that have a significant character and puts in place objectives and controls to maintain the existing character of the area and sensitively integrate new development. **Figure 12.2** shows the location of the SLO1.

The SLO1 relates to the Glenelg Estuary and Surrounds, which is recognised as a regionally significant landscape as the confluence of the Glenelg River estuary, the Southern Ocean, and the coastal edge. The following landscape character objectives to be achieved within SLO1 are relevant to the Project:

- To protect locally significant views and vistas, to the ocean, the Glenelg River Estuary and other natural landforms from Nelson-Portland Road, the GSWW and other publicly accessible locations.
- To protect the indigenous coastal vegetation and ensure that it is the dominant feature of the landscape when viewed from the foreshore.
- To retain the undeveloped and vegetated character of coastal dunes, waterways and estuaries near the coastal edge of this landscape.
- To minimise any increase in development visible above the dunes and coastal vegetation outside settlements, when viewed from the beach, foreshore or offshore by discouraging:
    - buildings set high on dunes
    - development that will be visible on the skyline
    - buildings set on visible ridge lines and visually prominent hill faces.
- To encourage vegetated landscape edges to the settlement of Nelson, which soften the interface of built and rural areas, and avoids expansion of built areas beyond current boundaries.

12.4.2.2 Significant Landscape Overlay – Schedules 2 and 3

Wind turbines would also be visible from portions of landscape within Significant Landscape Overlay – Schedule 2 (SLO2 Bridgewater Lakes and Surrounds and Significant Landscape Overlay – Schedule 3 (SLO3)Cape Bridgewater and Cape Nelson. SLO2 is approximately 13 km from the nearest wind turbine, and SLO3 approximately 18 km from the nearest turbine. SLO2 recognises Bridgewater Lakes as being of State significance for its outstanding visual and scenic qualities in addition to the international importance as part of a Ramsar wetlands site. SLO3 also recognises Cape Bridgewater and Cape Nelson as a landscape of State significance, noting the spectacular cliffs, pristine bays and dramatic coastal scenery that are unique to Victoria. The location of the SLO2 and SLO3 are shown on **Figure 12.2**

12.4.3 Landscape character areas

Landscape character has been defined in the LVIA as the distinct and recognisable pattern of elements that occur consistently in a particular type of landscape, such as landforms, land use and settlement.

The LVIA identified seven LCAs within the Project viewshed (see **Table 12.5** and **Figure 12.3**). These LCAs represent areas that are relatively consistent and recognisable, in terms of key landscape elements and physical attributes such as a combination of topography/landform, vegetation/landcover, land use and built structures (including settlements and local road corridors). These are indefinable as discrete areas, where characteristics within one LCA may occur within an adjoining or surrounding LCA. See Section 8.2 of the **LVIA (Appendix L)** for a full assessment of these LCAs.

Table 12.5 Landscape character areas

LCA	Area description	Overall sensitivity rating
LCA 1 – Nelson township	Nelson is a small town of approximately 200 inhabitants, which extends east and west of Glenelg River, and is connected by a bridge spanning the river north of the estuary and Oxbow Lake. The town is approximately 5 km west of the Project Area. The town is supported by tourism offering fishing and other river/land-based activities.	Moderate

LCA	Area description	Overall sensitivity rating
LCA 2 – Beach, sand dunes and lakes	LCA 2 is characterised by beach, sand dunes and lakes forming the coastal edge (incorporating the Discovery Bay Coastal Park and a section of the Great Southwest Walk) which extends in a south-west alignment from Nelson to around Mount Richmond. The sand dunes and lakes are bordered by open pasture to the north and pine plantation which extends toward the Mount Richmond National Park.	Moderate to High
LCA 3 – Glenelg River	Glenelg River forms a central feature through the Lower Glenelg National Park, carving a course through limestone rocks. The river is flanked by forest extending north and south of the corridor, making it hidden from view. The river supports passive recreation within the National Park, flowing north-west then south to Nelson and the river mouth to the ocean.	High
LCA 4 – Glenelg Estuary and Oxbow Lake	The Glenelg estuary and Oxbow Lake are located around 5 km to the west of the Project Area and south of the Portland Nelson Road.	Moderate to High
LCA 5 – National parks (forest)	The Lower Glenelg, Cobboboonee and Mount Richmond National Parks are located north and south-east of the Project Area with large areas of forest extending across the landscape toward and beyond the Glenelg River corridor.	Moderate to High
LCA 6 – Open pasture	Open pasture extends to the east and west of the Project Area and occurs within a mosaic of landscape elements between the coastal edge, plantation and National Parks.	Low to Moderate
LCA 7 – Pine plantation	Pine plantation is a dominant feature within the viewshed and extends to the broader regional landscape.	Low to Moderate

12.4.4 Landscape sensitivity

Landscape sensitivity for each LCA (see **Section 12.4.3**) was determined based on the existing use of the area and the degree to which the particular landscape can accommodate further change. Landscape sensitivity was determined using several criteria, including landform and scale, landcover, settlement and human influence, movement, rarity, and intervisibility. Typically, the more modified an existing landscape is, the lesser the sensitivity of the landscape is to further change.

The landscape within the viewshed is considered to have a Moderate to High landscape sensitivity to change. It represents a landscape that is reasonably typical of landscape types found in some surrounding areas of the Glenelg Shire, and more broadly within south-west Victorian coastal landscapes.

As a landscape with a Moderate to High sensitivity to accommodate change, some characteristics are likely to be altered by the wind farm; however, the landscape would have some capability to accommodate and absorb change. This capability is largely derived from the presence of predominantly broad, consistent and visually contiguous landscape characteristics formed by extensive stands of pine plantations both within, and beyond the Project Area.

12.4.5 Landscape values

Landscape values have been considered as a set of professional judgements on the importance to society of the local and regional landscape surrounding the Project. Societal landscape values may extend across a range of specific interest areas such as historic, ecological, or cultural issues. The purpose of identifying local and regional landscape values is to consider what, if any, changes to landscape features or characteristics may result from the construction and operation of the Project, and how this may impact on people's association with the landscape.

The LVIA did not identify any 'iconic' landscape elements (constructed or natural features) within the local or regional landscape. The LVIA did identify elements recognised at a national level (such as the Glenelg River and Glenelg Estuary and Discovery Bay Ramsar site (the Ramsar site)) which are subject to broader scientific and public value. Local landscape values are also recognised through the designation of National Parks, Coastal Parks and Marine Parks as well as several smaller flora and scenic reserves.

Most of the land within the Project Area is privately owned (with some areas of the Kentbruck Plantation accessible by permit). At a local and regional scale, opportunities for the public to access and explore this landscape, or to obtain more distant and panoramic views is more likely to occur on a day-to-day basis from existing rights of way such as road corridors or a small number of official lookouts, including Jones Lookout around 10 km north of the Project Area. Views from highly valued landscapes would occur from the coastal edge including in the vicinity of beach, sand dunes, lakes and camping sites within these areas, including those within the SLO1, as well as more distant views from Bridgewater Lakes and sections of the GSWW around Cape Bridgewater.

A cultural values assessment was undertaken for the Project (see Section 6 of the **Aboriginal Cultural Heritage Technical Report** (**Appendix J**)). Whilst several tangible and intangible cultural values of Gunditj Mirring country were identified within the Project Area, of relevance to this chapter are the Cultural View Lines. Several Cultural View Lines are present within the Project Area which provide visual links between sites and aspects of the landscape that hold cultural significance for the Gunditj MIrring. These act as a places of teaching and for navigation for the Gunditj Mirring as well as hold cultural value as places of visual and spiritual connection.

Legend

- Wind Farm Site
- Distance from Project
- Underground Transmission Line
- Electrical Substation
- Proposed Turbine Location
- 275 kV Powerline - Overhead
- Great South West Walk
- Landscape Feature or Locality
- Roads
- Watercourses
- Existing Overhead Transmission Lines
- Significant Landscape Overlay (SLO1)
- Significant Landscape Overlay (SLO2)
- Significant Landscape Overlay (SLO3)
- Parks and Reserves
- Township

Image Source: ESRI Basemap (2022) Data source: DELWP (2021)

FIGURE 12.2

Key landscape features and designations in the region

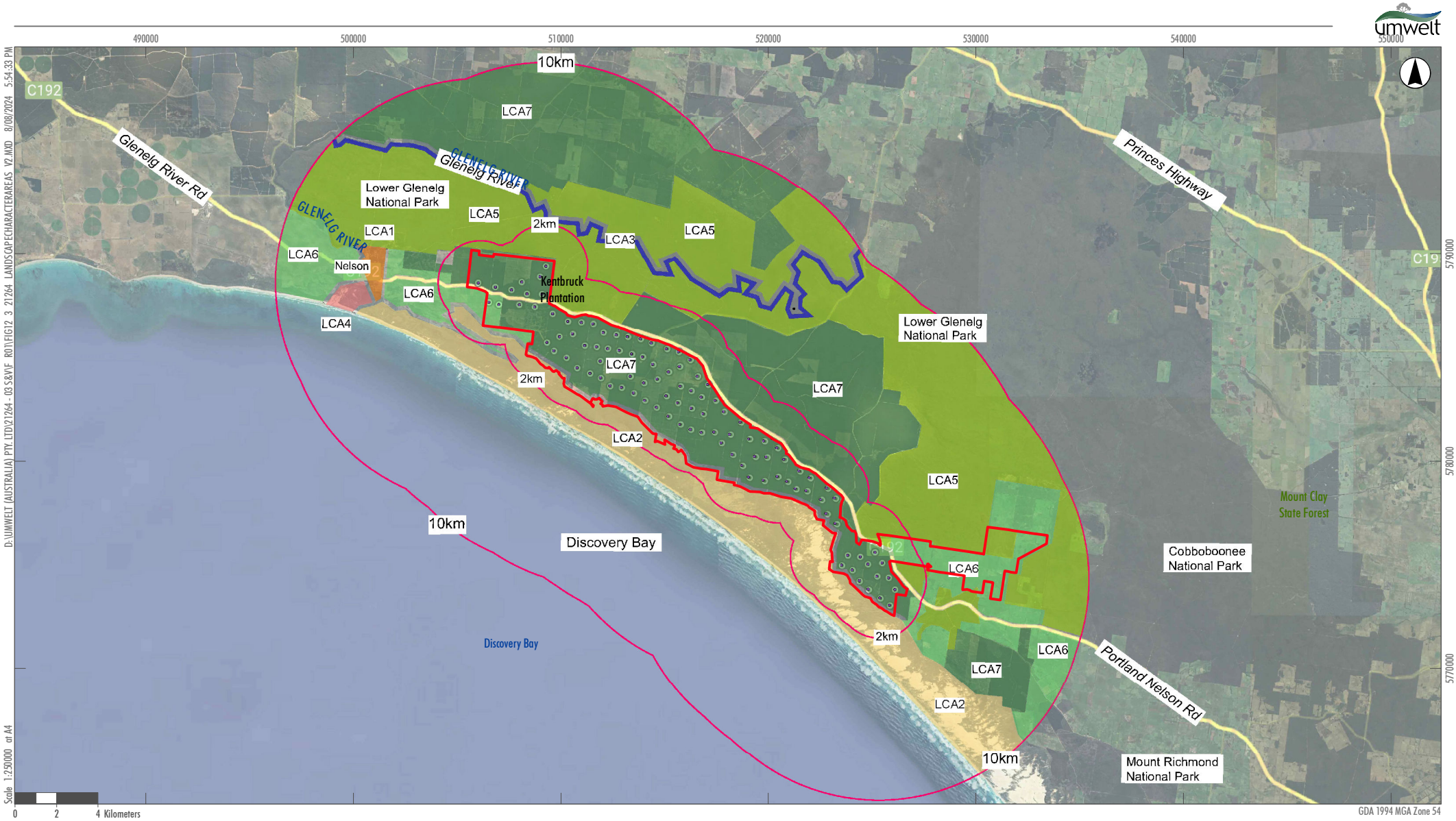

FIGURE 12.3
Landscape Character Areas

Image Source: ESRI Basemap (2022) Data source: DELWP (2021)

12.4.6 Key locations

The LVIA considered the potential visual effect of the Project on key view locations surrounding the Project Area, as shown in **Figure 12.4** (excluding dwellings which are considered below). The assessment determined the visual effect on views from the locations outlined in **Table 12.6.** The sensitivity and magnitude for each key view location had been determined in accordance with the methodology outlined in **Section 12.3.1.2**. The resulting visual effect from the Project on these viewing locations is provided in **Table 12.9.**

Table 12.6 Key viewing locations and assigned sensitivity and magnitude

Viewing location	Sensitivity	Magnitude
Nelson township	High	Negligible to Low (for areas screened by surrounding development or vegetation) Moderate to High (from Wade Street elevated areas with an easterly open aspect)
Glenelg estuary and surrounds	High	Moderate
Publicly accessible locations	High	Low
Ocean beach foreshore and GSWW and Discovery Bay Coastal Park	High	Negligible where screened by dunes Moderate from ocean foreshore High from proximate views on the inland track
Lake Mombeong campsite, lakes and swamps	High	High
Swan Lake campsite	High	Moderate to High
Named lookouts (Hedditch Hill Scenic Reserve, Lake Mombeong to Ocean Beach track lookout)	High	Moderate to High to High
Named lookouts ((Green Pool lookout, Celia lookout, Jones lookout)	High	Low to Moderate
Local roads	Low	Moderate
Agricultural land	Low	Moderate

12.4.7 Dwellings

Non-involved dwellings within 10 km of the wind farm site were identified to determine the potential for the Project to result in visual impacts on these dwellings. A total of 50 non-involved dwellings were identified within 10 km of the wind farm site. The locations of these dwellings are shown in **Figure 12.5.** An assessment of the potential visual impacts of wind turbines on non-involved dwellings within 10 km of the wind farm site is provided in **Section 12.6.2.2**

12.4.8 Nearby wind farms

There are three other operational wind farm developments within the same regional context as the Project, as outlined in **Table 12.7**. Portland Wind Energy Project consists of Cape Bridgewater, Cape Nelson South and Cape Nelson North.

Table 12.7 Nearby wind farms

Wind farm	Turbine tip height (metres above ground level)	Status	Number of turbines	Approximate distance to Project Area (km)
Cape Bridgewater Wind Farm	110 m	Operating since 2008	29	19.5 km
Cape Nelson South Wind Farm	110 m	Operating since 2009	22	19.5 km
Cape Nelson North and Cape Sir William Grant Wind Farm	126.5 m	Operating since 2015	23	19.5 km
Codrington Wind Farm	81 m	Operating since 2001	14	51 km
Yambuk Wind Farm	106 m	Operating since 2005	20	57 km

Legend

- Wind Farm Site
- Distance from Project
- Electrical Substation
- Proposed Turbine Location
- Underground Transmission Line
- 275 kV Powerline - Overhead
- Landscape Feature or Locality
- National Park Camping Site and/Or Day Use Area
- Great South West Walk
- Roads
- Watercourses
- Existing Overhead Transmission Lines
- Parks and Reserves
- 2km Wind Turbine Viewshed
- Township

FIGURE 12.4

Key Public View Locations

Image Source: ESRI Basemap (2022) Data source: DELWP (2021)

Legend

- Wind Farm Site
- Distance from Project
- Electrical Substation
- Proposed Turbine Location
- Underground Transmission Line
- 275 kV Powerline - Overhead
- Dwelling within 10km
- Landscape Feature or Locality
- National Park Camping Site and/Or Day Use Area
- Great South West Walk
- Roads
- Watercourses
- Existing Overhead Transmission Lines
- Parks and Reserves
- 2km Wind Turbine Viewshed
- Township

FIGURE 12.5

Key Dwelling View Locations

Image Source: ESRI Basemap (2022) Data source: DELWP (2021)

12.5 Construction impacts

The majority of pre-construction activities, some of which would result in physical changes to the landscape are generally temporary in nature and for the most part restricted to various discrete areas within or beyond the immediate wind farm site. Most pre-construction and construction activities would be unlikely to result in an unacceptable level of visual effect for their duration and temporary nature. Project construction activities would not result in any shadow flicker or blade glint impacts.

To mitigate potential temporary visual impacts during construction of the Project, tree removal will be minimised where possible, temporary lighting spill beyond the construction will be avoided, disturbed areas will be progressively rehabilitated and mature trees within the Project Area will be protected where possible (see mitigation measure MM- LV05).

12.6 Operation impacts

12.6.1 Landscape character effects

Summary of potential impacts on landscape character areas

The assessment determined that the landscape sensitivity within the Project viewshed ranged from Low to Moderate sensitivity, up to High sensitivity, with landscape characteristics that are generally typical of types found in the local area and more broadly within the south-western Victoria marine and coastal landscape. Areas of Moderate and High landscape sensitivity related to natural areas associated with Glenelg Estuary and Oxbow Lake, Glenelg River, coastal environments south of the Project along Discovery Bay, as well as Nelson township. Areas of plantation and open pasture within which the wind farm site were assessed as having Low to Moderate landscape sensitivity.

The assessment found that LCAs with a Moderate to High sensitivity to change would be altered by the Project, however these LCAs would be expected to have some ability to accommodate and absorb the landscape character changes from the Project. This would be primarily because of the broad and consistent characteristics of the landscape within and beyond the Project Area associated with the pine plantation, and to a lesser degree, open pasture.

There is the potential for more substantial landscape character effects on LCAs with a higher landscape sensitivity, most notably within the coastal zone along the southern boundary of the wind farm where the Project has the potential to be visually prominent from certain locations. Landscape characteristics may be impacted by the Project at these High sensitivity locations, particularly where existing landscape features or elements are not able to mitigate (predominantly through screening) these effects.

Summary of potential impacts on Significant Landscape Overlays

Three SLOs as designated under the Planning Scheme were assessed as being potentially relevant for the Project (see **Section 12.4.2**).

Significant Landscape Overlay – Schedule 1

Around 1,309 hectares of the western extent of the Project Area is covered by the SLO1. Twelve wind turbines would occur within the SLO1: eight in the plantation coupe north of Portland Nelson Road and four south of Portland-Nelson Road, within open pasture and plantation coupe. The portion of the SLO1 area occupied by wind turbines is not considered to have a direct visual link with the Glenelg Estuary or river where surrounding forests/plantations, roadside tree cover along the Portland Nelson Road corridor and low undulating coastal sand dunes limit views toward key landscape features or localities.

The Project seeks to retain the 'undeveloped and vegetated character' of coastal dunes, waterways, and estuaries by positioning wind turbines to the north-eastern portion of land affected by the SLO1. Wind turbines would be located over six km from the Glenelg Estuary (specifically, the picnic area at the western extent of Beach Road) and approximately three km from the coastal foreshore area. Where there are partial views of the wind turbines from the picnic area of the Glenelg Estuary, the location of the wind turbines would not impinge on views toward, or within the estuary or the Glenelg River corridor located within the SLO1 area. As such, the Project seeks to support the landscape character objective of retaining the current character of the areas affected by the SLO1.

An assessment of the Project against the decision guidelines for the SLO1 as set out in the Planning Scheme is provided in **Table 12.8.**

Table 12.8: Assessment of the Project against the SLO1 Decision Guidelines

Decision guideline	LVIA response
Whether the development encroaches into or is visible within 500 metres of scenic coastal viewpoints, lookouts, and the Great South West Walk (outside the urban area of Nelson).	Wind turbines within SLO1 will be located beyond 500 m of scenic coastal viewpoints, lookouts and the GSWW outside of the urban area of Nelson and therefore will not be visible within 500 m of these viewpoints.
Whether the development is designed and sited: - *low on slopes;* - *amongst vegetation; and has a form conforming to the topography of the land retaining natural and/or rural character.*	Wind turbines within SLO1 are located on gently undulating land and not low on slopes. Wind turbines within SLO1 are located amongst vegetation associated with the surrounding pine plantations and will conform to the topography of the land but will change the character of the modified plantation landscape character.
Whether development sited outside of the urban area of Nelson: - *retains views and vegetation.* - *intrudes into undeveloped areas visible from the Portland-Nelson Road, Beach Road, and the Glenelg River.*	Whilst wind turbines within SLO1 will be visible elements within the landscape they will not block views beyond the Project Area or SLO1. The wind turbines within SL01 are in a semi developed landscape modified to produce forestry timber. Wind turbines within SLO1 will be visible from portions of the Portland Nelson Road and Beach Road (toward the Glenelg Estuary) but will be significantly screened by tree planting around the Glenelg River or built development with the Nelson TZ.
Whether development located within the urban area of Nelson is set back a sufficient distance: - *from the Glenelg River so that it is not visible behind indigenous vegetation from the river edge.* - *to allow for the protection or rehabilitation of a substantial area of riparian vegetation.*	Wind turbines within SLO1 will not be visible from behind indigenous vegetation from the river edge. Wind turbines within SLO1 will not require protection or rehabilitation of substantial areas of riparian vegetation.
Whether buildings near the Glenelg River Estuary are low scale.	The Project will not include any buildings to be constructed near the Glenelg River Estuary.
Whether development within the coastal strip is: - *sited on the inland slope of dunes and does not protrude above the dune ridgeline;* - *sufficiently set amongst existing vegetation and maximises the retention of indigenous coastal vegetation;* - *using appropriate indigenous vegetation to integrate the development into the landscape; designed to follow the natural contours or step down the site;* - *sited to avoid visually dominant elevations;* - *minimising overlooking of the foreshore; and* - *Avoiding access into highly visible or undisturbed areas.*	Wind turbines within SLO1 will not be located on the inland slope of active dune systems or protrude above dune ridgelines when viewed from key view locations. Wind turbines within SLO1 will be set amongst the pine plantation and will maximise retention of indigenous coastal vegetation. Appropriate indigenous vegetation will be used where appropriate to screen views toward wind turbines within SLO1 from non-involved dwelling locations as outlined in this LVIA. Wind turbines within SLO1 will avoid visually dominant elevations, which are largely limited within the extent of the Project Area. Wind turbines within SLO1 will not be visible from the ocean foreshore. The wind turbines within SLO1 are located on private land which is not accessible to the public.
Whether development has regard to Coastal Spaces Landscape Assessment Study (Planisphere, 2006), in particular the relevant Character Area Paper.	This LCVIA has been prepared with regard to the Coastal Spaces Landscape Assessment Study.

Significant Landscape Overlay – Schedule 2 and Schedule 3

The Project would be noticeable from areas of landscape subject to SLO2 and SLO3 under the Planning Scheme, including named lookouts and areas along the coastal zone. No part of the Project would within areas subject to the SLO2 and SLO3. The assessment found that the Project would not impact on or contradict landscape character requirements or relevant decision guidelines for these overlays.

12.6.2 Visual effects of wind turbines

ZTV diagrams were used to identify theoretical areas of the landscape from which wind turbines, or portions of turbines (blade tips and hub height) may be visible from areas within and surrounding the Project. Elements such as visibility, distance, movement, relative position, climatic / atmospheric conditions, commercial plantations, and skyline views were considered. Photomontages and wireframes were also prepared to illustrate the general appearance of wind turbines from view locations and surrounding areas following the review of ZTV diagrams. Refer to Appendix M of the **LVIA (Appendix L)** for these figures.

12.6.2.1 Public view locations

Table 12.9 provides an assessment of the potential visual effect of the Project on key view locations surrounding the Project Area. The visual effect grading matrix ranges from Negligible (there is no specific interest and visible change is extremely minor) to High (areas of interest focused on view locations and wind turbines are highly visible / dominate the view and disrupt existing views). The location of these view locations are shown in **Figure 12.4,** with photomontages of some key view locations shown in **Figure 12.6** to **Figure 12.9**.

Three public viewing locations have been assessed as being susceptible to potentially High visual effects: Lake Mombeong campsite, lakes and swamps, sections of the inland track and some identified named lookouts (Lake Mombeong and Hedditch Hill Scenic Reserve). There are three public viewing locations with a Moderate to High potential for visual effects: Parts of Nelson Township (along Wade Street), Glenelg Estuary and Swan Lake campsite. The potential visual effects at other public viewing locations are assessed on a scale of Low to Moderate.

The public viewing locations with potential High or Moderate to High visual effects are publicly accessible areas with open or partially screened views to the wind farm. The visibility of turbines from these locations would be variable contingent on the viewing distance and the degree of intervening screening from vegetation and landform. The duration of time that views are experienced would also be variable, dependent on whether visitors are using the campsite facilities and/or the network of walking tracks which provide access to other recreational activities within these areas or taking advantage of the identified named lookouts in the region.

The Project's turbine layout has been refined in response to the potential visual effects on these and other adjoining visual receiver types. This has included setting back turbines from the Lake Mombeong Campground and removing turbines to maintain visual connectivity of ocean views from the Hedditch Hill Scenic Reserve area. Refer to Section 4.3.1.4 of **Chapter 4 *Project development*** for further information.

Table 12.9: Visual effect from key viewing locations

Viewing location	Assessment	Visual effect
Nelson township	Wind turbines within the west of the wind farm site would be visible from elevated areas within the eastern portion of Nelson, including dwellings along elevated land on Wade Street. However, views from these dwellings would be partially or completely screened by other built structures within the urban area as well as a surrounding, gently undulating landform beyond the Glenelg River and estuary and discrete areas of vegetation. Given the potential for screening, the Project would be unlikely to have any significant visual effect on most people living, working, or visiting in Nelson.	Negligible to Low (where screening exists) Moderate to High (where wind turbines visible form Wade Street)
Glenelg estuary	Views from publicly accessible areas surrounding the estuary would be partially restricted by landform and low coastal vegetation. Upper sections of wind turbines may be visible from some locations including the picnic area at the end of Beach Road and some parts of the conservation reserve. The closest wind farm to the picnic area would be around 6 km and is unlikely to form a dominant visual element.	Moderate to High

Viewing location	Assessment	Visual effect
Publicly accessible locations	Distance and existing vegetative cover is likely to partially and/or completely screen potential views to the Project from public open spaces, walking tracks and conservation areas, including popular camp sites and day use areas along the Glenelg River within the Lower Glenelg National Park. A majority of the GSWW are likely to be completely screened by extensive stands of vegetation and tree cover.	Low (due to tree cover)
Ocean beach foreshore and inland lake track	The ocean beach foreshore, and part of the GSWW, extends for around 30 km north-west to south-east parallel to the wind farm site. Wind turbines are set back around 3 km from the foreshore and visually separated along a significant portion of the foreshore by a series of large to moderately sized sand dunes (10 – 20 m in height). Views from the northern section of the foreshore will be largely screened by sand dunes. The GSWW crosses the dunes and extends inland along Lake Mombeong for around 7 km, from which there may be views toward wind turbines, however some screening potential may be provided by coastal vegetation along the inland track. Views from much of the 250 km GSWW would not extend toward the Project Area or wind farm site.	Negligible where screened by dunes Moderate where partially screened by sand dunes High from sections of the inland track (GSWW)
Lake Mombeong campsite, lakes and swamps	Views from Lake Mombeong campsites/day use area and associated walking tracks would extend toward wind turbines located in the plantation. Wind turbine towers will be screened by trees (but exposed following harvesting), with the rotor and hubs visible above the skyline formed by a backdrop of plantation trees. Whilst offset 2 km from the campsite, wind turbines would form a visible and dominant element within the view from this location.	High
Swan Lake campsite	Views from Swan Lake campsites/day use area and associated walking tracks would extend toward wind turbines located in the plantation. Wind turbine towers will be screened by landform and tree cover, however the rotor and hub would be visible above the skyline formed by a backdrop of gently undulating and sloping landform and tree cover.	Moderate to High
Named lookouts	There are a small number of named and formalised (constructed) lookouts surrounding the wind farm site where vantage points extend to broad landscape vistas that would include views toward wind turbines. These include: • Green Pool lookout located on the GSWW at Cape Bridgewater • Celia lookout located at the western extent of Discovery Bay Road • Hedditch Hill Scenic Reserve lookout on Portland Nelson Road • Lake Mombeong to Ocean Beach track lookout • Jones Lookout on the Winnap Nelson Road. These are located at a range of distances from turbines, from 2 km at Lake Mombeong lookout to around 20 km at Green Pool lookout. Whilst view distance will reduce the overall scale of wind turbines, the view from distant lookouts would be subject to a distinct change where turbines would form a noticeable element disrupting an existing strong horizontal form.	Moderate (Celia Lookout, Jones Lookout and Green Pool) High (Lake Mombeong and Hedditch Hill SR)
Local roads	Views towards wind turbines and ancillary infrastructure would occur from Portland Nelson Road, which would generally be restricted to upper portions of the wind turbines that would largely be screened by plantation trees. The dynamic and constantly changing nature of views from vehicles travelling along local roads would tend to be transitory in nature and short term.	Low to Moderate
Agricultural land	The level of visual effect on people engaged in farming activities would depend on the type of activities engaged in as well as the location of the activities, together with the degree of screening provided by local vegetation within individual properties.	Low to Moderate

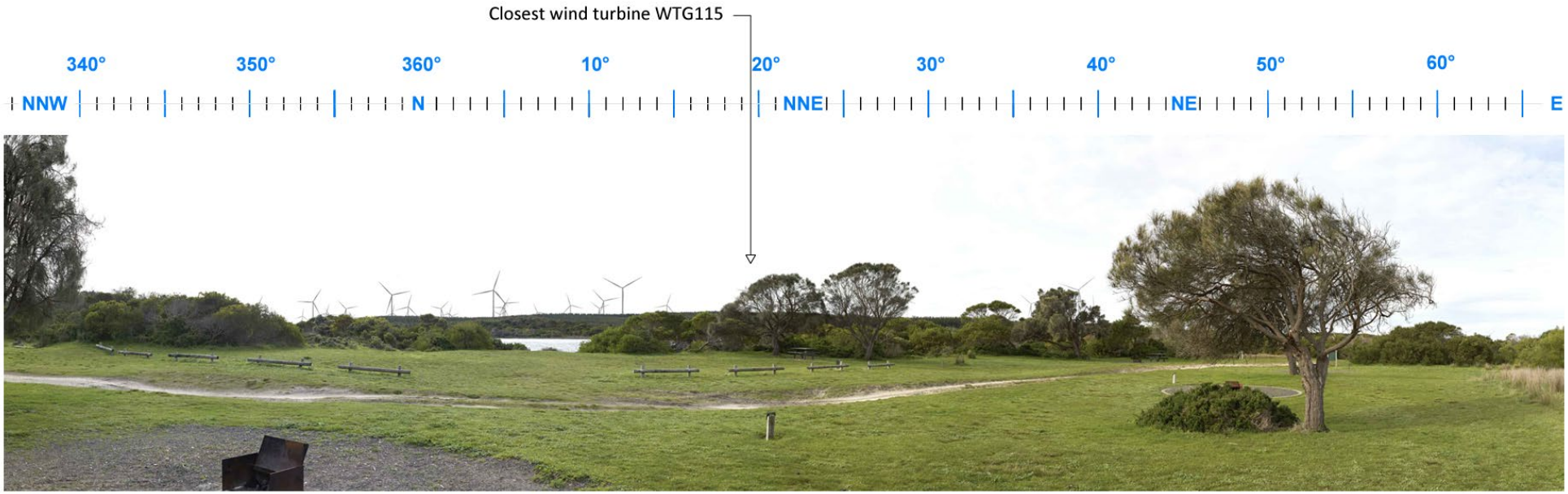

Figure 12.6: Approximate 90° field of view north-north west to east-north east from Lake Mombeong campsite

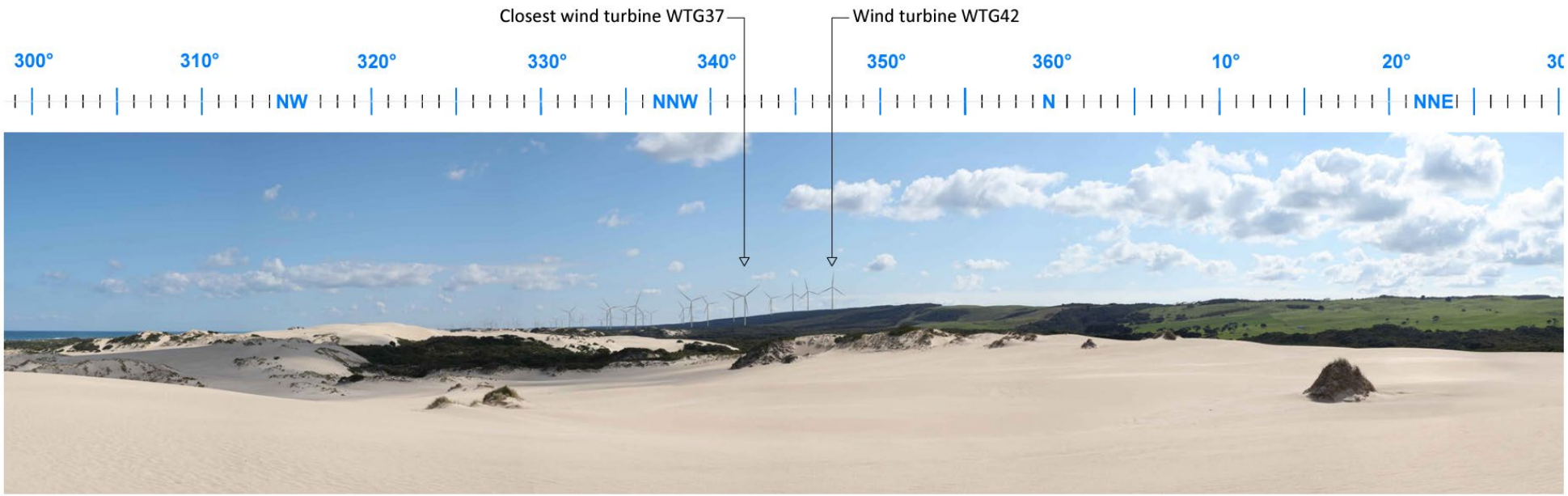

Figure 12.7: Approximate 90° field of view north to east from sand dunes at Swan Lake

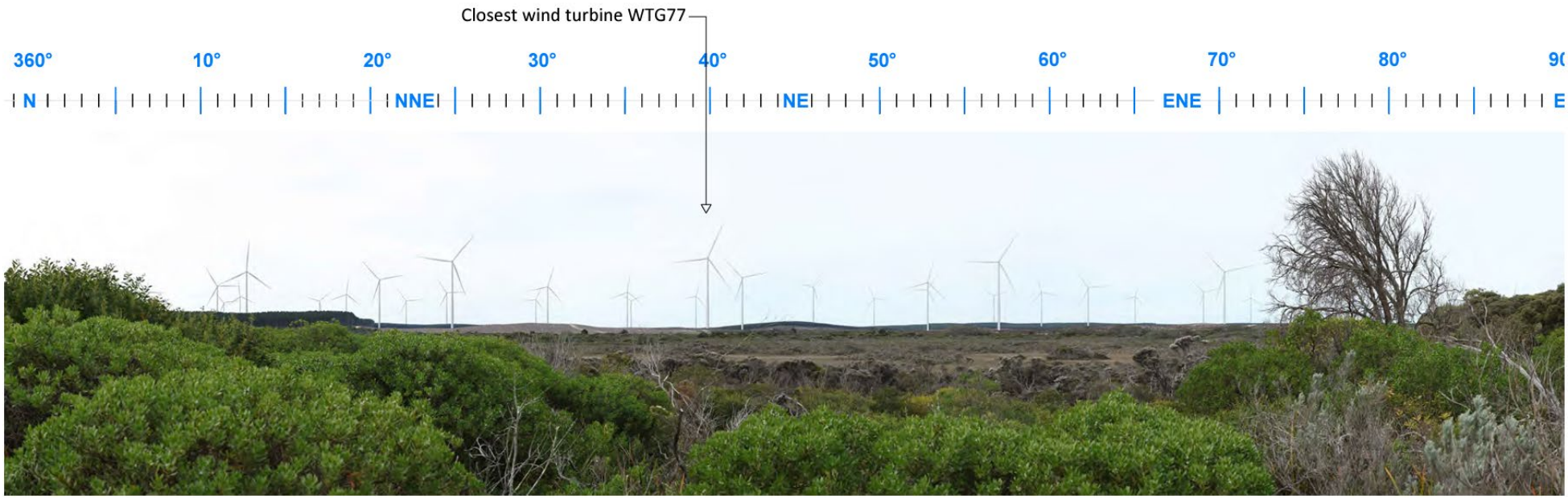

Figure 12.8: Approximate 90° field of view north to east from Lake Mombeong inland track

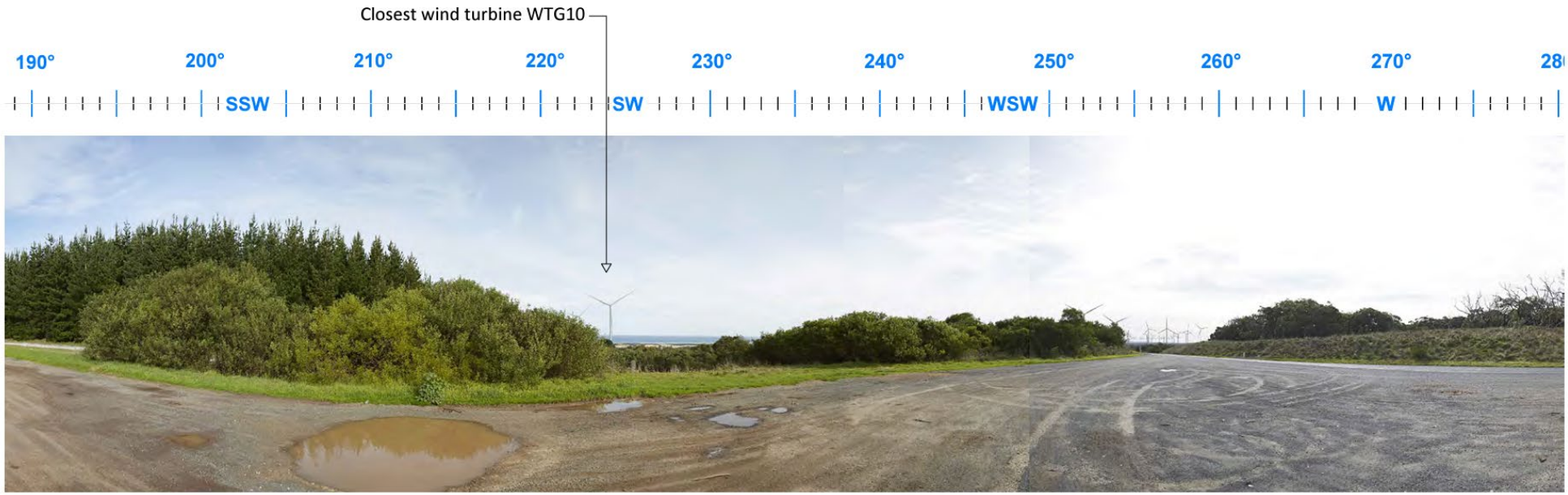

Figure 12.9: Approximate 90° field of view south to west from Hedditch Hill

12.6.2.2 Private view locations

There are 50 non-involved dwellings (private view locations) within 10 km of the wind turbines. Dwellings beyond 10 km were assessed as being unlikely to be significantly impacted due to varying degrees of tree planting that may offer greater screening, as well as increased distances from the wind turbines. **Figure 12.5** shows the locations of the dwellings within 10 km of a wind turbine.

An overview of the assessment of non-involved dwellings within 10 km of wind turbines is provided in **Table 12.10** which determined:

- 5 dwellings would experience a High visual effect.
- 2 dwellings would experience a Moderate to High visual effect.
- 8 dwellings would experience a Moderate visual effect.
- 6 dwellings would experience a Low to Moderate visual effect.
- 2 dwelling would experience a Low visual effect.
- 27 dwellings would experience a Negligible visual effect.

The field assessment for most non-involved dwellings was undertaken from the closest publicly accessible location, with a conservative approach adopted where there was no opportunity to confirm the actual extent of available view from areas within or immediately surrounding the dwelling. It is anticipated that some visibility ratings would be less than those determined subject to a process of verification of existing screening from private property. The number of dwellings likely to experience a Negligible visual effect partly results from the extent of tree cover (both native and plantation) that surrounds and extends beyond dwelling locations out to 10 km.

Soft landscape works (tree and shrub planting) will be installed at non-involved dwellings within 10 km of wind turbines where the Project would result in Moderate–High to High visual effects. Landscape works will aim to filter or screen views toward wind turbines. The location and design of landscape screening is site specific and will require detailed analysis of potential views and consultation with potentially affected landowners (see mitigation measure MM-LV02).

Table 12.10: Potential visual effects at non-involved dwellings within 10 km of Project Turbines

Receiver	Approx. distance to closest turbine (km)	Degree of visibility and screening	Potential visual effect	Residual visual effect
R1	3.8 km	Moderate distance views from the dwelling and curtilage would extend toward wind turbines within the western portion of the wind farm site, including wind turbines above plantation trees beyond pastoral land in the foreground. Views from the dwelling are largely open with limited screening to the south and east of the dwelling.	Moderate to High	Low to moderate
R2	3.3 km	A dense stand of trees extends south from the dwelling to the road corridor providing a degree of screening toward wind turbines within the south-west portion of the Project Area including wind turbines located within open grazing land. Views are partially limited due to tree screening to the east of the dwelling.	Moderate	Low
R3	2.75 km	Short distance views from the dwelling and curtilage would extend toward wind turbines within the north-western portion of the Project Area, including wind turbines within plantation to the north of the Portland Nelson Road corridor. The landform rises gently to the east of dwelling (up to around 30 m Australian Height Datum (AHD), which would provide some degree of screening toward some portions of wind turbine. Views are generally open with a small number of mature trees scattered around the dwelling.	Low to Moderate	Low
R4	2.3 km	Short distance views of the western portion of the wind farm site, including turbines within plantation and grazing land. Views are generally open with a small number of low trees/shrubs scattered around the dwelling. Taller tree planting alongside Earls Road may provide some degree of screening toward the Project Area.	Moderate to High	Low
R5	2.1 km	The dwelling is orientated north-east to south-west to take advantage of views toward the coast. Short distance views of the western portion of the wind farm site, including turbines within plantation and grazing land. Views from the dwelling are partially restricted by tree cover east of the dwelling.	Moderate to High (driveway) Low (dwelling)	Low
R6	2 km	Short distance views of the western portion of the wind farm site, including turbines within plantation and within grazing land. Views are partially restricted by tree cover east of the dwelling.	Moderate to High	Low to Moderate
R8	2.5 km	Short distance views of the western portion of the wind farm site, including turbines within plantation and within grazing land. Views are largely open with limited tree cover/screening surrounding the dwelling.	Moderate to High	Low to Moderate

Receiver	Approx. distance to closest turbine (km)	Degree of visibility and screening	Potential visual effect	Residual visual effect
R10	2.2 km	Short distance views of the western portion of the wind farm site, including turbines within plantation and within grazing land. Views are largely open with limited tree cover/screening surrounding the dwelling.	High	Moderate
R18	1.3 km	Short distance views of wind turbines are largely constrained by tree planting within the dwelling curtilage and within plantation areas extending beyond the dwelling. Views toward wind turbines are likely to be significantly screened and potentially screened beyond plantation harvesting due to non-plantation trees within the dwelling curtilage.	Moderate	Low
R21	1.1 km	Short distance views of wind turbines to the north-west through to south-east. Views are partially open, with low coastal vegetation surrounding the dwelling and agricultural sheds/structures beyond.	High	Moderate
R27	1.8 km	Short distance views from the dwelling and curtilage toward wind turbines within the Project Area will be screened by dense native tree cover and a gently undulating landform to the south through to north-west of the dwelling.	Negligible	Negligible
R31	2 km	Short distance views from the dwelling and curtilage toward wind turbines within the Project Area will be screened by dense native tree cover and a gently undulating landform.	Negligible	Negligible
R34	2.2 km	Short distance views from the dwelling and curtilage toward wind turbines within the Project Area will be screened by dense native tree cover and a gently undulating landform.	Negligible	Negligible
R40	4 km	Views from the dwelling and curtilage toward the wind farm site will be screened by native tree cover and a gently undulating landform.	Low to Moderate	Low
R55	5 km	Views from the dwelling and curtilage toward wind turbines within the Project Area will be screened by native tree cover and a gently undulating landform. Views from the dwelling may extend north across the Portland Nelson Road corridor toward the main substation and operations and management facility (O&M facility) location.	Moderate	Low
R62	5.5 km	Views toward wind turbines will be screened by native trees surrounding and beyond the dwelling.	Negligible	Negligible
R64	5.7 km	Views toward wind turbines will be screened by native trees surrounding and beyond the dwelling.	Negligible	Negligible
R67	6.5 km	Views toward wind turbines will be screened by native trees and landform to the west of the dwelling.	Negligible	Negligible

Receiver	Approx. distance to closest turbine (km)	Degree of visibility and screening	Potential visual effect	Residual visual effect
R73	6.9 km	Views toward wind turbines will be screened by tree cover surrounding the dwelling as well as plantation tree planting between the dwelling and the Portland Nelson Road corridor.	Negligible	Negligible
R81	7 km	Views toward wind turbines will be screened by extensive woodland tree cover beyond the dwelling as well as a gently undulating landform between the dwelling and the Portland Nelson Road corridor.	Negligible	Negligible
R82	7 km	Views toward wind turbines will be screened by woodland tree cover west of the dwelling as well as a gently undulating landform between the dwelling and the Portland Nelson Road corridor.	Negligible	Negligible
R91	7.7 km	The dwelling is surrounded by scattered and dense stands of tree cover associated with Cobboboonee National Park to the north of the Portland Nelson Road. Views toward wind turbines from the dwelling would be largely screened by tree cover.	Negligible	Negligible
R95	9 km	Views toward wind turbines would be screened by woodland tree cover west of the dwelling as well as a gently undulating landform between the dwelling and the Portland Nelson Road corridor.	Negligible	Negligible
R674	1 km	Views would extend toward wind turbines to the south of the Portland Nelson Road corridor within a generally direct and open aspect. Dwelling 674 is identified as a working shed.	Moderate to High	Low
R675	655 m	The dwelling is surrounded by native tree cover as well as a significant extent of plantation to the north of the dwelling. Whilst wind turbines are proximate to the dwelling location, it is likely that tree cover would provide screening to most wind turbines. Tree cover surrounding the dwelling would also continue to provide some level of screening following plantation harvesting; however, views from local roads would provide more significant views toward wind turbines following pine plantation harvesting operations.	Low to Moderate	Low to Moderate
R678	8.2 km	Moderate distance views from the dwelling toward wind turbines within the western portion of the Project Area would be partially obscured by a low undulating landform extending east of the dwelling.	Low to Moderate	Low
R679	7.2 km	Moderate distance views from the dwelling toward wind turbines within the western portion of the Project Area would be partially obscured by a low undulating landform rising to the east of the dwelling.	Low to Moderate	Low to Moderate
R680	6.8 km	Moderate distance views from the dwelling toward wind turbines within the western portion of the Project Area would be partially obscured by scattered tree planting and a low undulating landform rising to the east of the dwelling.	Low	Low

Receiver	Approx. distance to closest turbine (km)	Degree of visibility and screening	Potential visual effect	Residual visual effect
R705	4.9 km	Moderate distance views from the dwelling toward the wind turbines within the western portion of the Project Area would be partially screened by a low undulating landform rising east of the dwelling as well as planting to the east side of the dwelling.	Moderate	Low
R706	4.8 km	Moderate distance views from the dwelling and curtilage toward wind turbines within the western portion of the Project Area would be partially screened by scattered tree planting to the east of the dwelling.	Moderate	Low
R707	4.9 km	Moderate distance views from the dwelling and curtilage toward wind turbines within the western portion of the Project Area would be partially screened by scattered tree planting to the east of the dwelling.	Moderate	Low
R708	4.8 km	Moderate distance views from the dwelling and curtilage toward wind turbines within the western portion of the Project Area would be partially screened by scattered tree planting to the east of the dwelling.	Moderate	Low
R709	4.3 km	Moderate distance views from the dwelling and curtilage toward wind turbines within the western portion of the Project Area would be partially screened by agricultural buildings and scattered tree planting to the east of the dwelling.	Moderate	Low
R710	4.1 km	Moderate distance views from the dwelling and curtilage would extend toward wind turbines within the western portion of the Project Area including wind turbines within plantation and grazing land. Some partial screening may be provided by tree planting to the eastern side of the dwelling.	Moderate	Low
R711 and R712	4.5 km	The Parks Office and depot are screened tree cover which would obscure views toward the wind turbines.	Negligible	Negligible
R713	9.6 km	Various buildings within the Princess Margaret Rose Cave complex are surrounded and screened by relatively dense native tree cover which would screen most views toward the Project Area.	Negligible	Negligible
R714, R715 and R716	8.7 km	The three adjoining dwellings are located to the north of the Glenelg National Park, above the Glenelg River and accessed from Currawong Road. Views toward wind turbines would be screened by a combination of tree cover surrounding the dwellings and extensive native tree cover to the south-east of the dwelling.	Negligible	Negligible
R717	8 km	Views toward the wind turbines would be screened by a combination of native tree cover to the south and south-east of the dwelling.	Negligible	Negligible

Receiver	Approx. distance to closest turbine (km)	Degree of visibility and screening	Potential visual effect	Residual visual effect
R718	9.8 km	Views toward the wind turbines would be screened by a combination of native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R719	4.9 km	Views toward the wind turbines would be screened by a combination of native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R720	9.4 km	Views toward the wind turbines would be screened by a combination of native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R721	5.4 km	Views toward the wind turbines would be screened by a combination of native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R722	9.9 km	Views toward the wind turbines would be screened by a combination of undulating landform, native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R723	8 km	Views toward the wind turbines would be screened by a combination of native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R724	9.1 km	Views toward the wind turbines would be screened by a combination of native tree cover and plantation to the south and south-west of the dwelling.	Negligible	Negligible
R725	8.1 km	Views toward the Project Area and wind turbines would be screened by native tree cover to the south of the dwelling.	Negligible	Negligible
R726	10.3 km	Views toward the wind turbines would be partially screened by a combination of plantation and native tree cover to the south and south-west of the dwelling.	Negligible	Negligible
D1 dwellings with within the Nelson NZ to the west of Wade street extending to the Glenelg River corridor	4.7 km	Dwellings located within the Nelson Transport Zone (TZ), between Wade Street and west toward the Glenelg River would have limited and predominantly restricted views toward the Project Area or wind turbines. This would be due to several factors including: • Dwellings and other built structures blocking views from neighbourhood properties. • Scattered tree cover within private properties and denser forested areas north of the Portland Nelson Road. • Landform dropping gently toward the Glenelg River corridor. The exception to the above are around three dwellings located along the western side of Wade Street between Neil Black Street E and Meredith Street where views may extend toward some wind turbines in the west portion of the wind farm site.	Negligible to Low Moderate to High (Wade Street dwellings)	Low to Moderate

Receiver	Approx. distance to closest turbine (km)	Degree of visibility and screening	Potential visual effect	Residual visual effect
D2 dwellings within the Nelson TZ located to the east and west of Beach Road south of the Portland Nelson Road.	4.7 km	Dwellings located within the Nelson TZ, along Beach Road south of the Portland Nelson Road, would have limited and predominantly restricted views toward the Project Area or wind turbines. This would be due to tree screening surrounding and beyond the dwellings.	Negligible	Negligible
D3 dwellings within the Nelson TZ located to the west of the Glenelg River	5.3 km	Dwellings located within the Nelson TZ, to the west of the Glenelg River would have limited and predominantly restricted views toward the Project Area or wind turbines. This would be due to several factors including: • Dwellings and other built structures blocking views from neighbourhood properties. • Scattered tree cover within private properties and denser forested areas north of the Portland Nelson Road. A small number of dwellings with some minor elevation above the river (north of Old Bridge Road) may have views toward wind turbines where unobstructed by other dwellings or vegetation.	Negligible to Low Moderate for two dwellings north of Old Bridge Road	Low

12.6.3 Landscape character and visual effects of ancillary infrastructure

The Project was assessed as having Moderate to High ability to absorb the addition of the ancillary infrastructure including overhead power lines and substations due to undulating landforms and plantation and native tree cover within the Project Area. An on-site landscape screening plan will be developed to further screen substations, buildings and infrastructure (see mitigation measure MM-LV03).

Most of the overhead powerline between the western collector substation and the eastern collector substation along Portland Nelson Road (see Section 3.3.3.3 in **Chapter 3** ***Project description***), would be located within visually confined areas, including those defined by narrow view corridors created by plantation adjoining Portland Nelson Road. The plantation trees would form a dark consistently coloured backdrop to electrical infrastructure alongside the road corridor with views largely from passing traffic. Views towards the powerline would be screened by native tree cover alongside the road corridor and would not form a distinct or dominant feature in the landscape.

Non-involved dwellings are unlikely to have views toward ancillary items.

The transmission line connecting the Project to the Heywood Terminal Station would be underground and would not have any noticeable landscape character or visual impacts once operational.

12.6.4 Night lighting effects

Some existing night-time light sources occur within the Project viewshed and include residential, general amenity and road lighting associated with surrounding urban areas. However, most of the wind farm site has no existing illumination and presents as a dark sky environment.

Potential light sources associated with the wind farm would include low intensity night lights for the substations and construction compounds. Most lighting would be temporary and in use for emergency maintenance, safety, and security purposes. Potential receivers that could be impacted by night lighting include residents and motorists. Night lighting would not be visible from sensitive visual areas including the ocean beach, camping areas or landscape surround Glenelg Estuary.

Night-time lighting associated with the Project is unlikely to have a significant visual impact on most public viewer locations. Whilst temporary substation lighting may be visible to motorists travelling along local roads, the duration would be very short term and partially screened by undulating landform and vegetation along some sections of local road corridors.

Potential impacts from night lighting would be mitigated by minimising security lighting throughout the wind farm site, switching station and substation, to reduce the contrast between the Project and the surrounding night time environment. Motion detectors would be employed to activate night time security lighting when required, and designing ancillary lighting to ensure it does not spill onto nearby roads and dwellings (see mitigation measure MM-LV05).

12.6.5 Cumulative landscape character and visual effects

The assessment in Section 12 of the **LVIA** (**Appendix L**) considers the predicted cumulative effects of the addition of the Project to a baseline scenario.

There are three wind energy developments that are currently operational within the same regional context as the Project, Codrington Wind Farm, Yambuk Wind Farm, and Portland Wind Energy Project (see **Figure 12.10**). Overall, the Project is not predicted to significantly increase the magnitude of visual effect for most dwelling locations surrounding the Project. The potential for cumulative visual effects is mitigated by distance, and screening or partial filtering of views toward approved and existing wind farms.

The closest wind turbines to the Project are at Cape Bridgewater Wind Farm, approximately 20 km to the south-east. At an equidistant view location (10 km between each project) wind turbines would occupy less than 2% of a person's vertical view and not result in a significant cumulative visual effect.

Sequential views from local roads would be mitigated to some extent by undulating landform and tree cover alongside road corridors, as well as the fact that these wind farm projects are not located along a single highway or thoroughfare.

There would not be any cumulative visual impacts from any proposed offshore wind farms. The Southern Ocean Declared Area is located offshore between Yambuk and Warnambool, and is approximately 77 km from the nearest wind turbine proposed for the Project, eliminating any potential for cumulative impacts due to distance.

Legend

- Wind Farm Site
- Distance from Project
- Electrical Substation
- Proposed Turbine Location
- Underground Transmission Line
- Great South West Walk
- Roads
- Watercourses
- Existing Overhead Transmission Lines
- Township
- Parks and Reserves
- 2km Wind Turbine Viewshed
- Operating Wind Farm Locations
- Proposed Wind Farm Locations
- Operating Solar Farm Locations
- Proposed Solar Farm Locations

FIGURE 12.10

Cumulative visual impacts

Image Source: ESRI Basemap (2022) Data source: DELWP (2021)

12.6.6 Shadow flicker and blade glint

Section 5.1.2 of the Planning Guidelines for Development of Wind Energy Facilities in Victoria (DTP, 2023) (Planning Guidelines) states shadow flicker experienced immediately surrounding the area of a dwelling (garden fenced area) must not exceed 30 hours per year as a result of the operation of the wind energy facility.

The shadow flicker model simulates the path of the sun during the year and calculates the position of the sun relative to wind turbines, dwellings, and terrain to predict possible shadow flicker durations in the vicinity of the wind farm site from a geometrical perspective. This calculation gives the theoretical number of hours of shadow flicker experienced at the dwelling. The model was calculated to a distance of 265 x blade chord length (m) from the turbines and was performed at 1-minute time intervals with a resolution of 10 m. **Table 12.11** outlines the turbine dimensions modelled for these calculations.

Table 12.11: Wind turbine model dimensions

Number of wind turbines	Maximum blade cord (m)	Rotor diameter (m)	Hub height above ground level (m)	Rotor tip height (m)
105	4.87	190	175	270

Table 12.11 shows the turbine modelled had a hub height of 175 m and rotor diameter of 190 m, which equates to a top tip height of 270 m and lower tip height of 80 m. This reflects a conservative approach to modelling shadow flicker as the dimensions are a worst-case scenario because it models the highest (and largest) rotor swept area, which will project shadows over the longest distance.

Shadow flicker was calculated using both ‘worst case’ and realistic ‘expected case’ results. The worst-case modelling was undertaken based on the assumption of zero cloud cover and assuming the sun is shining the entire day, compared to an ‘expected case’ which considered the statistical likelihood of cloud cover for different time of day and month of year. Historical cloud cover statistics taken from Mount Gambier Airport, approximately 55 km from the wind farm site informed the ‘expected case’ modelling.

Worst case modelling determined shadow flicker is likely to exceed 30 hours per year at two non-involved receivers as outlined in **Table 12.12** (receivers 21and 675). Exceedances were also predicted at Receiver 674, however this receiver is identified as a working shed and not a dwelling and therefore no further consideration of potential shadow flicker effects is required. All other receivers were calculated to have zero hours of shadow flicker.

Table 12.12: Calculated shadow flicker exceedances

Receiver ID	Worst case shadow flicker (h/yr)	Worst case exceedance above 30 h/yr limit (h/yr)	Expected case shadow flicker (h/yr)	Expected case exceedance above 10 h/yr limit (h/yr)	Dwelling status
Receiver 21	64:51	34:51	29:05	19.05	Non-involved dwelling
Receiver 675	86:32	56:32	37:55	27:55	Non-involved dwelling

The model planning permit conditions for wind energy facilities include provision at condition 13 for agreements to be entered into with the relevant landowner waiving the requirement to not exceed 30 hours per annum at a pre-existing dwelling. The Proponent has agreements in place with the landowners of non-involved receivers 21 and 675, who acknowledge and accept this exceedance. The agreement would be in a form that applies to the land comprising a pre-existing dwelling for the life of the wind energy facility, to the satisfaction of the responsible authority, and will be provided to the responsible authority upon request.

Once the Project’s turbine locations have been finalised prior to construction, an updated shadow flicker assessment would be undertaken to minimise shadow flicker impacts on nearby receivers where possible, and to ensure there is no increase in exceedances (see mitigation measure MM-LV06).

In accordance with Section 5.1.2(c) of the Policy and Planning Guidelines, blade glint is not expected to an issue provided that wind turbines use non-reflective coatings on the blades of the wind turbines. Wind turbine technical specifications and procurement documentation must specify that all wind turbine blades be coated with a non-reflective finish to avoid possible effects of blade glint on surround dwellings (see mitigation measure MM-LV07).

12.7 Decommissioning impacts

Impacts associated with the decommissioning phase of the Project are expected to be negligible and primarily associated with the removal of infrastructure, similar to the impacts associated with the construction phase.

12.8 Mitigation measures

Table 12.13 outlines the mitigation measures developed to avoid, minimise, and manage landscape character and visual amenity impacts on receivers from the construction, operation and decommissioning of the Project.

Table 12.13: Landscape and visual mitigation measures

ID	Mitigation measure	Works area	Project phase
MM-LV01	**Public view locations** Consultation with Parks Victoria and Great South West Walk committee to investigate and implement potential mitigation to minimise visual effects on key public view locations. Mitigation works might consider additional planting strategies to increase levels of screening at specific sensitive viewpoint and/or to install/upgrade existing infrastructure at these locations to improve the sites as a way to offset potential impacts.	All areas	Design

MM-LV02	**Landscape screening**
	Soft landscape works (tree and shrub planting) will be installed at non-involved dwellings within 10 km of wind turbines where the Project would result in Moderate–High to High visual effects. Landscape works will aim to filter or screen views toward wind turbines.
	The implementation of landscaping works would be based on a reasonable and feasible approach to provide substantive screening of wind turbines, and to offer property owners the opportunity to opt in, or out of landscaping mitigation works to cater for individual visual mitigation preferences.
	Off-site landscape works will be facilitated through an off-site landscaping program, which will be prepared as part of the EMF. The off-site landscaping program will:
	• Include a methodology for determining:
	  ○ The type of landscaping treatments to be proposed
	  ○ A timetable for establishing and maintaining the landscaping for at least two years.
	• Include a process for making offers to affected landowners to undertake landscaping on the landowner's land.
	• Include a process for recording:
	  ○ Offers that have been made to landowners
	  ○ Whether or not the offers are accepted
	  ○ When and how offers are actioned following acceptance.
	• Include a process for the preparation and provision of progress reports regarding the implementation of the off-site landscaping program to be provided to the responsible authority.
	The off-site landscaping program:
	• Must be implemented to the satisfaction of the responsible authority.
	• Must not be altered or modified without the written consent of the responsible authority.
		All areas	Design

MM-LV03	**On-site landscaping plan** Development of an on-site landscaping plan to screen substations, buildings and lower infrastructure. This plan would include details of plant species to be used, and a maintenance and monitoring program.	All areas	Design

ID	Mitigation measure	Works area	Project phase
MM-LV04	**Infrastructure design and materials** Electrical infrastructure, and associated buildings and structures would be designed to have non-reflecting surface finishes and appropriate colour finishes that considers the existing visual backdrops.	All areas	Design
MM-LV05	**Lighting** Permanent project lighting associated with the O&M facility and terminal station and temporary lighting associated with construction areas is to be installed in accordance with Australian Standard AS 4282: Control of the obtrusive effects of outdoor lighting. These measures include: • ensuring lighting is baffled and directed to the ground. • installing motion-trigger mechanisms to reduce the duration of lighting • installing perimeter landscaping to intervene in views to lighting from identified sensitive receptors (residential dwellings).	All areas	Construction Operation
MM-LV06	**Shadow flicker assessment** A pre-construction shadow flicker assessment will be undertaken prior to construction once the final turbine layout has been determined, to determine potential effects of shadow flicker and ensure there is no increase in exceedances. The assessment will be undertaken in accordance with the DTP *Planning Guidelines for the Development of Wind Energy Facilities in Victoria*, and to the satisfaction of the responsible authority. Agreements must be entered into with the relevant landowner waiving the requirement to not exceed 30 hours per annum at a pre-existing dwelling. Agreements must be in a form that applies to the land comprising a pre-existing dwelling for the life of the wind energy facility, to the satisfaction of the responsible authority, and will be provided to the responsible authority upon request.	Wind farm site	Design
MM-LV07	**Non-reflective coating** All wind turbine blades must be coated with a non-reflective finish to avoid possible effects of blade glint on surround dwellings in accordance with the DTP *Planning Guidelines for the Development of Wind Energy Facilities in Victoria*, and to the satisfaction of the responsible authority.	Wind farm site	Design

12.9 Conclusion

Summary of landscape character effects

The landscape within the Project viewshed has a Moderate to High sensitivity to accommodate change and the Project would generally be acceptable within the viewshed landscape. Some key landscape characteristics, including those associated with the Discovery Bay Coastal Park and sections of the GSWW, may experience visual alterations to landscape characteristics which may not be fully mitigated by existing landscape elements or features visible within the landscape. Some areas including camp sites and day use areas along the Glenelg River corridor as well as other locations within adjoining national parks would have a greater ability to absorb change through extensive areas of native tree cover screening views toward the Project Area.

Summary of effects on significant landscapes

The wind farm site would occupy a portion of the SLO1 under the Planning Scheme resulting in landscape and visual impacts upon some of the key landscape character objectives. The portion of the SLO1 area occupied by wind turbines is not considered to have a direct visual link with the Glenelg Estuary or river. Surrounding forests/plantations, roadside tree cover along the Portland Nelson Road corridor and low undulating coastal sand dunes limit viewsheds and vistas toward key landscape features or localities.

Summary of visual effects

Turbines would be visible from Lake Mombeong campsite, day use area and pathways towards and around the lake, as well as some sections of the Lake Mombeong inland track. Views from these locations are likely to experience a moderate high to high visual impact. Turbines would be partially screened from views at Swan Lake campsite, day use area and local tracks by landform and tree cover beyond the campsite locality. Wind turbine visibility would increase to the west of the Swan Lake campsite including views from the coastal sand dunes between the Swan Lake campsite and ocean beach.

Part of the wind farm site would be visible from parts of the GSWW, including sections for an approximate 30 km length along the Discovery Bay foreshore south of the wind farm site. While some partial views to upper portions (hubs and blades) would be visible from the ocean foreshore beach, views toward wind turbines would be mitigated to some extent by sand dunes (and associated vegetation) rising above the foreshore. Views from most of the 250 km-long GSWW would not extend toward the Project Area or wind turbines.

The Project's turbine layout has been refined in response to the potential visual effects on these key view locations and other adjoining receiver types. This has included setting back turbines from the Lake Mombeong Campground and removing turbines to maintain visual connectivity of ocean views from the Hedditch Hill Scenic Reserve area.

The relatively low number of non-involved dwellings within 10 km of the wind turbines would be impacted to varying degrees where views would extend toward the Project Area and wind turbines. Most views from dwellings would experience limited wind turbine visibility due to tree cover. In some instances, these views would extend toward the wind farm site from elevated locations with minimal screen planting. Soft landscape works (tree and shrub planting) will be installed at non-involved dwellings within 10 km of wind turbines where the Project is assessed as potentially having Moderate - High to High visual effects. The location and design of landscape screening is site specific and will require detailed analysis of potential views and consultation with potentially affected landowners.

Views toward electrical infrastructure, including the collector substations, main substation and overhead cabling throughout the wind farm site would be limited to the Portland Nelson Road corridor. A high visual absorption capability provided by existing tree cover within and beyond the plantations would mitigate the extent and level of visual impact. Views toward electrical infrastructure from sensitive landscape areas and non-involved dwellings would also be mitigated by existing tree cover and landform.

Summary of potential cumulative landscape and visual effects

There are three wind energy developments that are currently operational within the surrounding region of the Project, Codrington Wind Farm, Yambuk Wind Farm, and Portland Wind Energy Project. The Project is not predicted to substantially increase the magnitude of visual effect for most dwelling locations surrounding the Project. The potential for cumulative visual effects is mitigated by distance, and screening or partial filtering of views toward approved and existing wind farms. The closest wind turbines to the Project are at Cape Bridgewater Wind Farm, approximately 20 km to the south east. At an equidistant view location (10 km between each project) wind turbines would occupy less than 2% of a person's vertical view and not result in a significant cumulative visual effect. Sequential views from local roads would be mitigated to some extent by undulating landform and tree cover alongside road corridors, as well as the fact that these wind farm projects are not located along a single highway or thoroughfare.

There would not be any cumulative visual impacts from any proposed offshore wind farms. The Southern Ocean Declared Area is located offshore between Yambuk and Warnambool, and is approximately 77 km from the nearest wind turbine proposed for the Project, eliminating any potential for cumulative impacts due to distance.

Summary of shadow flicker and blade glint effects

Worst case modelling undertaken for the Project determined that shadow flicker is likely to exceed 30 hours per year at two dwellings (receivers 21 and 675). The Proponent has agreements in place with the landowners of receivers 21 and 675, who acknowledge and accept this exceedance.

Blade glint was assessed as being unlikely to cause significant effects on receivers and there is industry-standard mitigation proposed that will ameliorate any potential effects, Wind turbine blades will be finished with a surface treatment of low reflectivity coating to ensure that glint is minimised.

The Project's turbine layout has been refined in response to the potential visual effects identified in the LVIA, and mitigation measures have been developed to minimise potential impacts on landscape character and visual amenity. It is therefore considered that the Project can satisfy the relevant landscape and visual evaluation objective specified in the Scoping Requirements, to avoid or minimise adverse effects on landscape and visual amenity.

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