Hexham Wind Farm

Preliminary Landscape and Visual Impact Assessment

REV - 0

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Hexham Wind Farm Pty Ltd

L A N D F O R M

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Contents

1. Introduction

Hexham Wind Farm Pty Ltd are seeking approval to develop a new wind energy facility in Western Victoria. The Hexham Wind Farm (the Project) would comprise up to 108 Wind Turbine Generators (WTGs) with a maximum height of up to 250m internal access tracks, wind monitoring towers, powerlines and on-site terminal station.

The Project is proposed in farming land approximately 3.0 km south-west of the rural township of Hexham. The closest regional town centre is Mortlake, approximately 15 km to the east.

The Project would be located across several privately owned and neighbouring properties. The combined sites are broadly defined by Hamilton Highway to the north, Woolsthorpe-Hexham Road to the east, Gordans Lane to the south, Grassmere-Hexham Road to the south-west and Warrnambool-Caramut Road to the west.

1.1 Purpose of this report

This report provides a preliminary landscape and visual impact assessment (PLVIA) of the proposed Hexham Wind Farm on behalf of Hexham Wind Farm Pty Ltd.

This assessment will support a referral under the *Environment Effects Act 1978* and provide a basis for the detailed LVIA required for a planning application to assist the Minister for Planning's assessment as to whether an EES is required.

This preliminary landscape and visual assessment is based on the guidelines set by the following documents:

- Ministerial guidelines for assessment of environmental effects under the Environmental Effects Act 1978;
- Referral of a project for a decision on the need for assessment under the Environment Effects Act 1978 – Referral Form; and
- Policy and planning guidelines for development of wind energy facilities in Victoria, Department of Land, Water, Environment and Planning, amended January 2016.

The 'Referral Form' outlines the objectives for a preliminary landscape and visual assessment for a wind energy facility. A preliminary landscape and visual assessment should discuss the following:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, aboveground utilities, tourist routes and walking tracks;
- 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.

This report will also examine the implications of the South West Regional Landscape Study.

The visual impact of the development relates to the:

- Number, height, scale, spacing, colour and surface reflectivity of the wind turbines
- Requirement (if any) for aviation obstacle lighting
- Proximity to sensitive areas and viewing locations
- Removal or planting of vegetation
- Avoidance of visual clutter and ability to view through a (visually) well-ordered array of turbines from sensitive locations
- Location and scale of other buildings and works including transmission lines and associated access roads

- Proximity to an existing or proposed wind energy facility, having regard to cumulative visual effects.

A further assessment will be required following the Ministers determination on the planning pathway for the Project. This further assessment will be prepared in accordance with the requirements set out in Clause 52.32 (Wind Energy Facilities) and Section 5.1.3 of the Policy and planning guidelines for development of wind energy facilities in Victoria. This further assessment would consider in greater detail the implications of the:

- Visibility of the development
- locations and distances from which the development can be viewed
- The significance of landscapes described in the planning scheme as being sensitive to development (including areas recognised by the National Parks Act 1975 or Ramsar Wetlands, relevant overlays, and strategic landscape studies)

2. Methodology

The methodology used within this Preliminary Landscape and Visual Impact Assessment (PLVIA) of the Project includes the following steps and tasks.

2.1 Project Description

The Project description defines the components of the Hexham Wind Farm that have the potential to contribute to a change in views and visual impact. This would include the proposed WTGs, overhead transmission lines, and terminal station. Other changes may also include access tracks, and construction activity. The most noticeable changes would be brought about by the WTGs. The WTG's will therefore be the focus of this PLVIA.

2.2 Study Area and Zones of Visual Influence

The study area for the PLVIA is considered as the distance at which the WTG's would no longer meaningful contribute to views. This distance is determined based upon the parameters of human vision and the overall height of the proposed WTG's. The rationale for this is discussed in Section 4 of this report.

2.2.1 Zones of Visual Influence

Zones of visual influence (ZVI) seeks to quantify the scale of the potential effects of a Project over varying distances. This step is a useful measure to contemplate the potential for visual dominance of the project in views.

2.3 Planning Policy Framework

This chapter will review relevant policies and strategic landscape assessments within the defined visual study area that are relevant to views, landscape sensitivity and visual impact.

This is review will assist in identifying features, landscapes, viewing locations that are required to be considered by Clause 52.32 (Wind Energy Facilities) and landscapes within the study area that may be sensitive to a change in views.

2.4 Landscape Character

This chapter will review the landscape character of the study area to identify landscape units. This will be partly based upon locations and areas identified in the policy review, observations made during the initial site visit undertaken to inform this PLVIA and desktop studies.

2.4.1 Landscape Character Units and Sensitivity

Landscape Character Units are based on the physical characteristics, land-use and planning provisions of the area within the Study area. Features that assist in defining the landscape character units and a sensitivity rating include geology, vegetation, topography and drainage patterns, urban development, and modification of the landscape. The use of the land and the underlying protections of an area that are afforded by the provisions within the planning scheme assist to determine the sensitivity of that area to visual change. This step recognises that the planning scheme identifies landscapes that are significant, rare, or threatened and provides guidance on how these features may be preserved.

The sensitivity of a landscape unit considers the ability for a landscape to accommodate the level of change that is proposed by a project. Generally, the greater the extent of modifications in an area, or the prevalence of the landscape type and its use, the lower the sensitivity that landscape would be to visual change.

These landscape units will assist in understanding a particular landscape's sensitivity to visual change.

2.5 Seen Area Analysis

A Seen Area Analysis (SAA) utilizes Geographical Information Software (GIS) to map the areas of theoretical visibility of the Project, as a whole or in part, utilising topographical data alone. The SAA is a conservative analysis tool as it does not

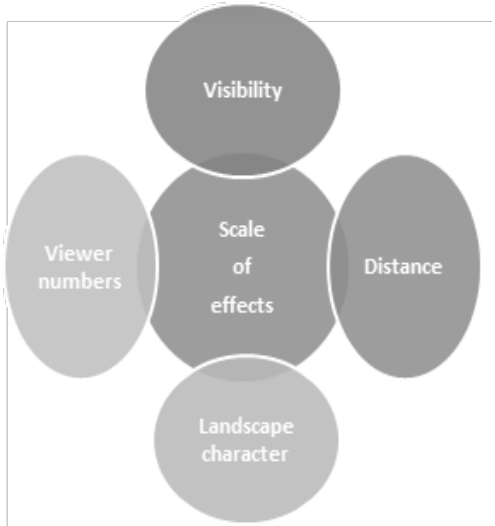
consider other factors that may affect visibility, such as intervening vegetation, built form or atmospheric conditions such as fog, low cloud or haze.

The SAA assists in selecting viewpoints which have theoretical visibility of the proposed WTGs, to be assessed within the report.

2.6 Publicly Accessible Viewpoints

This chapter will assess the visual impact of the Project from indicative viewpoints within the public domain. This assessment will be supported by photomontage imagery to assist with describing the location, scale and visibility of the Project.

The visual impact of a wind farm development from the public domain is based upon four criteria which are supported by the preceding steps and assessment tasks. These criteria and their influence in determining the assessment of the overall visual impact from the public domain are set out below:



- **Visibility**: The visibility of the Project elements can be affected by topography, vegetation, built form and infrastructure.
- **Distance:** WTG visibility and dominance will decrease with distance. The Zones of Visual Influence (ZVI) provides an indication of visual dominance and potential impact based on distance. This criterion is one of several to be considered when assessing the overall visual impact of the Project from any location.
- **Landscape Character and Sensitivity:** Landscape character of areas is based upon visual features such as topography, vegetation and the use of the land, the naturalness of the area and planning provisions. Sensitivity may also be influenced by specific landscape studies and assessments within the project study area. Typically, a modified landscape that is prevalent within the study area or the region is less sensitive than one that is ostensibly natural or protected for its environmental, ecological or cultural values.
- **Viewer numbers:** The overall level of visual impact, which considers these four criteria, will decrease where there are fewer people able to view the Project. Conversely, the level of visual impact may also increase where the viewing location is a recognised vantage point or tourist route where viewer numbers from these locations would be rated as 'high'.

A summary table is provided at the end of each of the viewpoint assessments to outline the key quantitative elements that form part of the views and visual impacts. The overall visual impact considers both qualitative quantitative criteria which is discussed at each viewpoint. The sum of the quantitative considerations alone does not form the basis of the overall visual impact.

The overall visual effect will range from Nil to High. The definition for each scale is discussed below.

2.6.1 Scale of Effects

The overall visual impact of the Project from an indicative publicly accessible viewpoint has been assessed using the following scale:

The following scale of effects provides a ranking system for the magnitude of change:

- **Nil** – **The** Project will be screened by topography, vegetation, buildings and structures or distance.
- **Negligible Visual Impact** – minute level of effect that is barely discernible over ordinary day-to-day effects. The assessment of a 'negligible' level of visual impact is usually based on distance. That is, the Project will be at such a distance that, when visible in good weather, it would be a minute element in the view within a modified landscape or will be predominantly screened by intervening topography, vegetation, or buildings and structures.

- **Low Visual Impact** – visual impacts that are noticeable but that will not cause any significant adverse impacts. The assessment of a "low" level of visual impact can be derived where several of the four criteria, which includes visibility, distance, viewer numbers, and landscape sensitivity, is assessed as low.

  Therefore, a wind farm in a landscape that is modified, or contains other structures or vertical elements may be rated as a low level of visual impact. Similarly, if the distance from which it is viewed means that its scale is similar to other elements in the landscape it would also be assessed as a low level of visual impact.

- **Medium Visual Impact** – A Medium visual impact occurs when several of the four assessment criteria are considered **as** higher than "low" or the visual effects can be mitigated/remedied from an initial rating of High. This will be moderated by the context of the existing view and the modifications within the landscape.

- **High Adverse Effect –** significant adverse effects that cannot be avoided, remedied, or mitigated. The assessment of a 'high' effect from a publicly accessible viewpoint requires the assessment of all criteria to be high. For example, a highly sensitive landscape, viewed by many people, with the Project in close proximity and visible to those people, would lead to an assessment of a high adverse effect.

- **Positive Visual Impact** – is a visual change that improves the outlook or view. For renewable energy projects, a positive **visual** impact may be experienced where the individual viewer appreciates the view of wind turbines in the landscape or the link to renewable energy. This positive reaction is supported by the findings in numerous community perceptions surveys undertaken within Australia and globally.

2.7 Impacts from Residential Dwellings

The proximity of nearby towns, residential clusters and dwellings will be identified sufficient to determine a sense of the Project in its overall setting.

The assessment of visual impact from residences is different to that undertaken from publicly accessible viewpoints in that visitor numbers is not applicable and landscape sensitivity is also always rated as 'high'. It is recognised that people feel most strongly about the view from their house and areas or attached outdoor living spaces.

Whilst not a requirement of a PLVIA, the guidelines do require the identification of sensitive viewing locations and sightlines and residential clusters surrounding the Project. For the purposes of this assessment a desktop study and site visit from publicly accessible locations has been undertaken to consider residential dwellings within 6.0km of a WTG.

An assessment of individual residential dwellings will be undertaken in the final Landscape and Visual Impact Assessment.

2.8 Landscape Mitigation

It is recognised that WTGs are unavoidably visible and often contrast with the environments in which they are situated. The assessment and approvals process are required to consider the acceptability of impacts on landscape values, the amenity of communities and residential dwellings and the ability of mitigation to manage these impacts.

Mitigation options available to manage the visual impact from locations that are significantly visually affected by a wind farm include:

- vegetation screening to filter or screen the proposed WTGs from dwellings or areas of private open space.
- re-siting of WTGs to locations where they would have less visual impact (or removal if necessary).

This LVIA will consider the ability for landscape screening to be effective at filtering or screening views towards the Project.

2.9 Cumulative considerations

The visual assessment of the Project will also consider the cumulative visual impacts of the Project considering other constructed and approved wind farms in the area. This assessment is based on both sequential views and simultaneous views.

The cumulative impact considers key routes such as highways and local roads from which sequential views may take in a number of wind farms along a journey to consider the impact that the Project would have on viewer's perception of the landscape in which they travel. Simultaneous views are locations where a viewer may see two or more wind farms at a specific location. These can be in the same or opposing directions.

3. Project Description

This section will describe the location and key features of the Project relevant to this landscape and visual impact assessment.

The Project involves the construction and operation of the Hexham Wind Farm. The Project area is situated approximately 15.0 km west of Mortlake, 14.8 km north-east of Woolsthorpe and 4.0 km south of Caramut. Hexham township, which is approximately 3.0 km to the north-east of the Project is the nearest settlement.

The Project would comprise the following components:

- Up to 108 WTGs each with three blades mounted on a tubular steel tower, with an overall height of 250 metres Above Ground Level (AGL).
- On-site terminal station and switchyard located adjacent to the existing 500 kV powerline within the site boundaries.
- Above ground transmission lines supported by steel mono poles connecting the Project to the on-site terminal station.
- Operations and maintenance building (proximate to the terminal station);
- New and upgraded internal access tracks; and
- Up to four (4) permanent meteorological monitoring masts.

The following elements would also be required during construction of the Project:

- Temporary mobile concrete batching plant to supply concrete for WTG footings and terminal station construction works.
- Cleared hardstand areas for construction equipment and storage.
- Temporary buildings and facilities for construction personnel/equipment; and
- External water supply for concrete batching plant and construction activities.

The location and layout of these would be considered in the detailed LVIA.

3.1 Wind Farm Location

The site is located in southwest Victoria, with a combined Project land area of approximately 16,000 hectares. Figure 3-1 shows the Project location, proposed wind farm boundary and preliminary WTG layout.

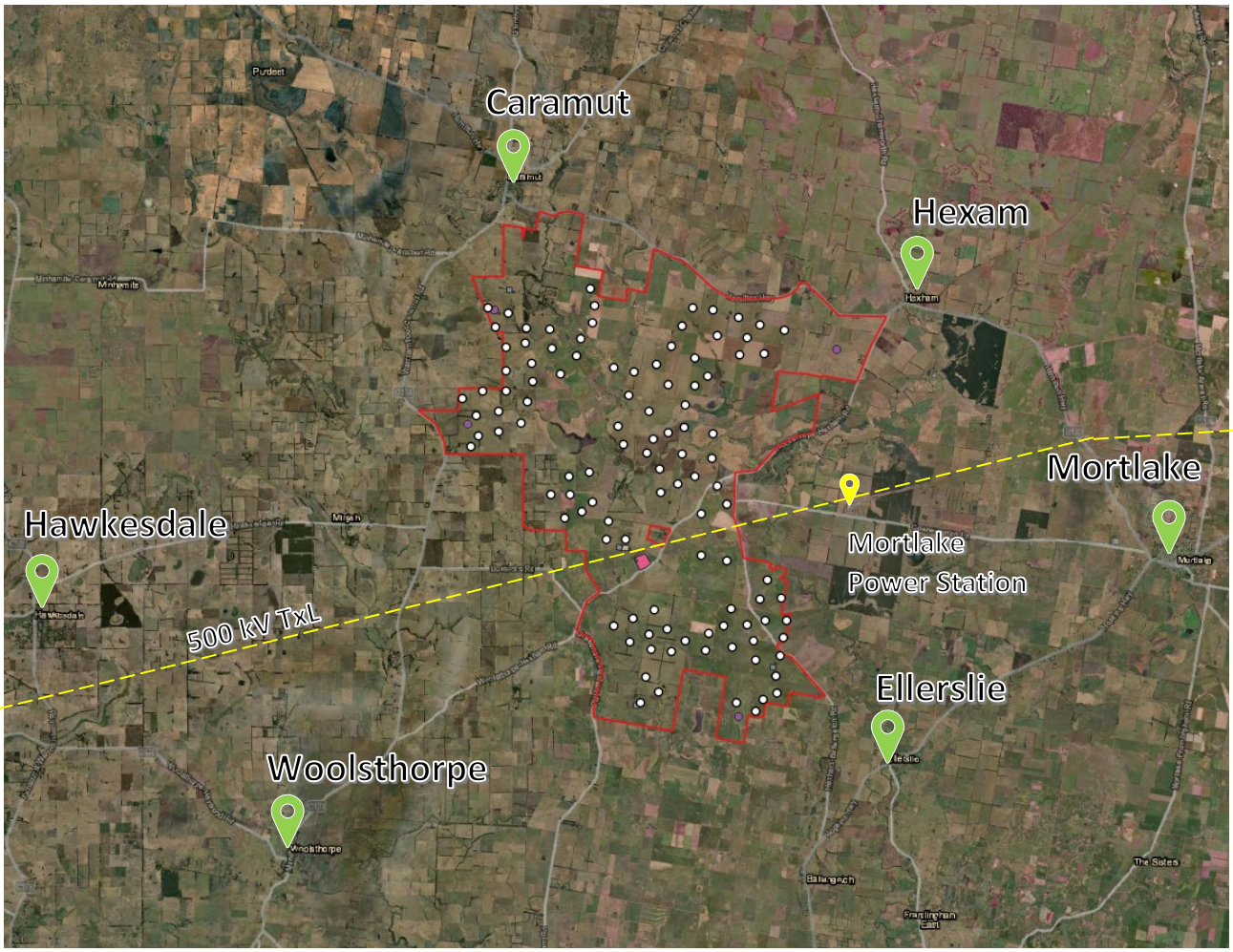


Figure 3-1 Project Location and proposed WTG layout

The Project is situated between the rural townships of Hexham, which is the to northeast, Mortlake to the east, Ellerslie to the south east, Woolsthorpe to the south-west, Hawkesdale to the west and Caramut to the north.

The Hamilton Highway, which is classified as a B class road by VicRoads, runs along the Projects northern boundary. The Hopkins Highway, also a B class road is to the south-east of Project. The Warnambool – Caramut Road to the west is designated as a C Class road. Local roads include the Woolsthorpe-Hexham Road to the east and Woolsthorpe – Caramut Road to the west.

The existing 500 kV Mortlake to Heywood Terminal high voltage transmission line runs through the southern portion of Project, between the Mortlake Terminal Station to the east and the Tarrone Terminal Station approximately 36 km to the west.

The predominant land use of the land within the Project site and much of the surrounding area is agriculture comprising a mixture of cropping and grazing (cattle and sheep). Accordingly, much of the area has been cleared of native vegetation supporting exotic grasses and cereal crops. Where remnant vegetation does remain, it is limited, stands of trees within farming areas, local nature reserve or along road reserves and natural drainages lines.

There are a number of existing, approved and proposed wind farms in Western Victoria. These projects are sited to take advantage of reliable wind resources and proximity to the existing 500 kV transmission line. Existing wind farms include Macarthur, Morton's Lane, Dundonnell, Salt Creek, Oaklands Hill wind farms and Mortlake South. Proposed and approved

wind farms include Mt Fyans, Hawkesdale, Ryan Corner, Willatook and Woolsthorpe. Considerations for cumulative visual impacts of the proposed Hexam Wind Farm are addressed in Section 11 of this report.

3.2 WTG Layout

The Project proposes up construct up to 108 WTGs, with a height to tip measurement of up to 250 m to the tip of blade. The proposed WTG layout is shown in Figure 3-2.

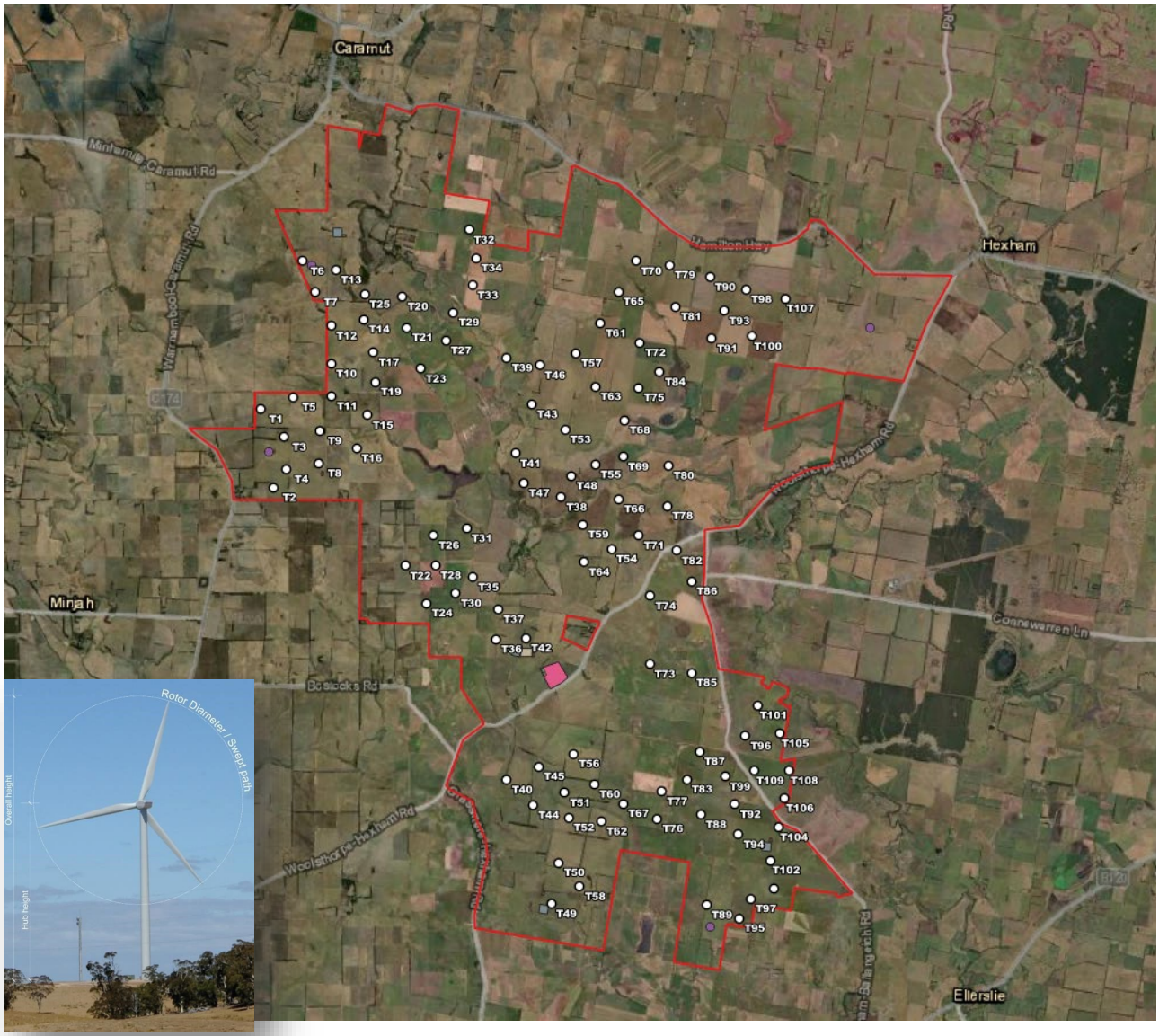


Figure 3-2 Indicative WTG layout

WTGs are the largest and most visually noticeable element of a wind farm. There are three key features of a WTG that are lend support to the assessment views and visual impact of a wind farm project.

These are the tower and hub height, length of the proposed turbine blades and rotor diameter. The overall combined height or tip of the turbine blade is determined by the height of the tower and blade length. Values may vary slightly between WTG models and manufacturers.

For this reason, maximum dimensions will be used to ensure that the assessment is conservatively based on the largest possible potential WTG model for the Project.

3.3 Aviation Obstacle Lighting

Results of the risk assessment done as part of the Aviation Impact Assessment will determine whether there is a requirement for installation of aviation obstacle lighting. Should such lighting be required, a separate assessment of the night-time visual impacts of the proposal would be incorporated within the detailed Landscape and Visual Impact Assessment.

3.4 Substations

The Project proposes one on-site terminal station and switchyard located adjacent to the existing 500 kV powerline within the site boundary;

The terminal station would be within a fenced enclosure of approximately 20 hectares. Figure 3-3 below shows a typical substation similar in scale to those proposed as part of the Project.

Figure 3-3: Typical terminal station

It is typically a requirement of a permit for perimeter screening planting to be installed along boundaries shared with sensitive uses such as nearby residential dwellings that are not associated with the Project.

The requirement for any landscape screening of the proposed collector substations/terminal station would be considered once the location has been determined.

3.5 Powerlines

The Project would require the construction of new overhead transmission lines connecting the project to the national grid.

The powerline voltage was not defined at the time of preparing this PLVIA. It is understood that the overhead power lines would be mounted on 40 m high steel monopoles.

The Project is proposed to connect into an existing 500 kV high voltage transmission line which traverses the Project site. Doing so, will limit the new overhead transmission lines to within the study area.

3.6 Access Tracks

The construction and operation of the Project would require the creation or upgrade of access tracks internal to the site.

New access tracks would have a beneficial outcome for host landowners and the Country Fire Authority (CFA) and are likely to be retained following decommissioning of the Project.

Access tracks would be required to construct the wind farm and for ongoing maintenance. Access tracks would be approximately 12 m in width with local widening of existing tracks to clear natural features or allow for turning radius of larger vehicles. Where possible, existing farm tracks would be reused and upgraded to reduce the construction of new access tracks for the wind farm.

Construction of new access tracks would require removal of topsoil to a suitable founding layer. The surface would be constructed by placing and compacting the road base layer. Where tracks cross drainage lines, crossings may need to be installed.

3.7 Operations and Maintenance facility

A permanent site control and operations building would be constructed adjacent to or within the on-site terminal station site. The control building may serve as a joint facility for the operation of the wind farm and the terminal station.

The overall heights of various elements within the on-site collector substations and terminal station would vary. The scale of these elements would be similar to farm structures and other utility transmission lines visible in the area.

3.8 Wind Monitoring Masts

Up to four wind monitoring masts would be constructed across the site. The height of wind monitoring masts are typically set at the proposed height of the turbine hub. Masts would comprise either steel lattice or tubular steel structure that is supported by three guy wires. Visually, wind monitoring masts are similar to radio communications towers often found in flat open rural landscapes.

3.9 Construction

Construction would likely take between 24 - 36 months. Construction activities, which are likely to have a landscape and/or visual impact, are likely to be the following:

- Temporary construction compound(s);
- Internal site access tracks;
- Establishing WTG foundations and crane hardstands;
- Terminal station and grid connection networks;
- Excavation of trenches and the laying of power and instrumentation cables;
- Erecting the WTGs;
- On site concrete batching plant(s); and
- Vehicular traffic.

Temporary on-site concrete batching plants may be required for the construction of the tower foundations. On-site batching plants are often a requirement to manage traffic impacts on the surrounding road network. Figure 3-4 Portable batching plant - Modular silo batching plant shows an example of a modular silo batching plant.

Figure 3-4 Portable batching plant - Modular silo batching plant

The temporary batching plants would be removed following completion of Project, stockpiles and hardstand areas would be rehabilitated and landscaped.

4. Study Area

This section establishes a rational basis on which to determine the extent of the view shed or study area for this assessment of the visual impact of the Project. Zones of Visual Influence will also be established.

The study area is the area from which the proposed WTGs could be recognisable within a view. The view shed is also the study area for visual impact of a wind farm. It may be possible to see WTGs from areas outside the view shed, however they would be at distances where they would be a small and barely noticeable element in the view.

The parameters of human vision include the vertical and horizontal fields of views as shown in Figure 4-1 and Figure 4-2. These figures are based on data from '*Human Dimension and Interior Space*', *Julius Panero & Martin Zellnik, Witney Library of Design,1979*. Similar data can be found in the more recent publication entitled '*The Measure of Man and Woman, Revised Edition', Henry Dreyfuss Associates, John Whiley & Sons, 2012*.

Typically, the vertical field of view of a person is 10°; therefore 0.5° is 5% of the vertical field of view. With an overall maximum height of 250 m, the WTGs would be the largest element of the Project. For this reason, the WTG height will form the basis on which to establish the view shed, and zones of visual influence for the Project.

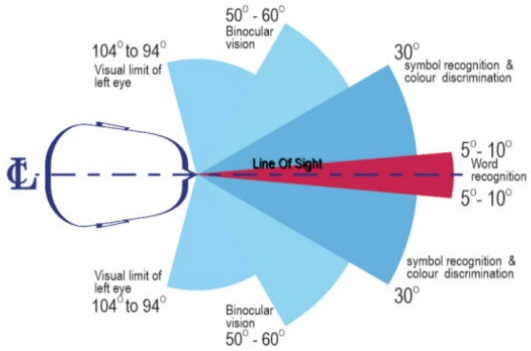


Figure 4-1 Horizontal field of view

The angle of the central field of vision is between 50º to 60º. This view angle is also relevant to the preparation and reproduction of perceptually accurate photomontages and printed reference imagery. By referencing a common benchmark, in this instance 60º, and utilising comparable camera specifications, scale of the proposed WTGs over varying distances can be reliably considered.

Figure 4-2 shows the vertical field of view and the assumption made to calculate the study area for the Hexham Wind Farm.

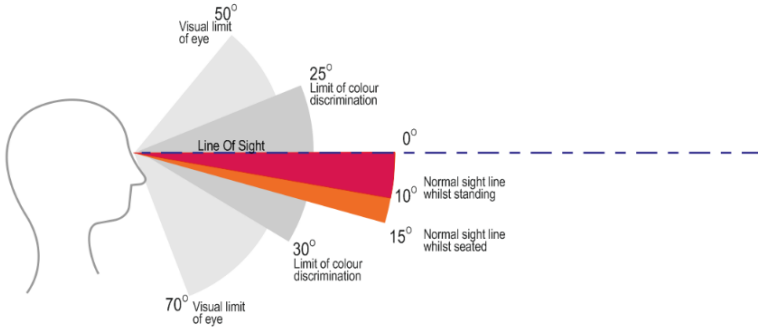


Figure 4-2: Determining the study area extent based on a WTG in the vertical field of view

The theoretical extent of the view shed can be considered to extend to a distance at which the tallest component of the Project would occupy less than 5% of the vertical field of view. Typically, the field of view of a person is 10°, whereby 5% of the vertical field of view is approximately equal to 0.5°.

The distance at which a 250 m high WTG would take up 5% (0.5°) of the vertical field of view is 28.6 km. The following section will describe the Zones of Visual Influence (ZVI) for the WTGs.

4.1 Zones of Visual Influence

Zone of Visual Influence (ZVI) assist to assess the overall visual impact of the proposed WTGs based on distance to a WTG. The calculations used to determine the view shed can also be used to define visual impact based on distance to a WTG. It must be recognised that zones of visual influence are one of several criteria for assessing visual impacts.

For example, when a view location is closer to a WTG, the WTG would take up a greater percentage of the vertical field of view.

Various Zones of Visual Influence (ZVI) have been calculated based upon the parameters of the human vision. The ZVI are outlined in Table 4-1.

Table 4-1: Zones of Visual Influence.

Distance to a WTG	Vertical angle of view (°)	Zones of Visual Influence
>28.60km	<0.5	**Visually insignificant – Extent of the project study area** A very small element in the view shed, which is difficult to discern and will be invisible in some lighting or weather circumstances.
14.5-28.6km	0.5-1.0	**Potentially noticeable, but will not dominate the landscape** The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer; however, the WTGs do not dominate the landscape.
6.0 -14.5km	1.0-2.5	**Potentially noticeable and can dominate the landscape** The degree of visual intrusion will depend on the landscape sensitivity and the sensitivity of the viewer.
3.0- 6.0km	2.5-5.0	**Highly visible and will usually dominate the landscape** The degree of visual intrusion will depend on the WTGs' placement within the landscape and factors such as foreground screening.
<3.0 km	>5.0	**Will always be visually dominant in the landscape** Dominates the landscape in which they are sited.

The Zones of Visual Influence provide a guide to the potential visual impact of a WTG(s) based solely on distance. However, it is recognised that the apparent size of the nearest WTG may not dramatically change when a viewer moves from 5.9 km to 6.1 km, for example. It is also noted that distance bands are only one parameter that must be included within the visual assessment. The overall assessment will also consider visibility, the number of viewers and the sensitivity of the landscape at the viewpoint.

Figure 4-3 shows the zones of visual influence and their zones relative to how the WTGs are perceived in views across the landscape. That is, the further away a WTG is from the viewing location, the smaller or lower they will appear in the vertical field of view.

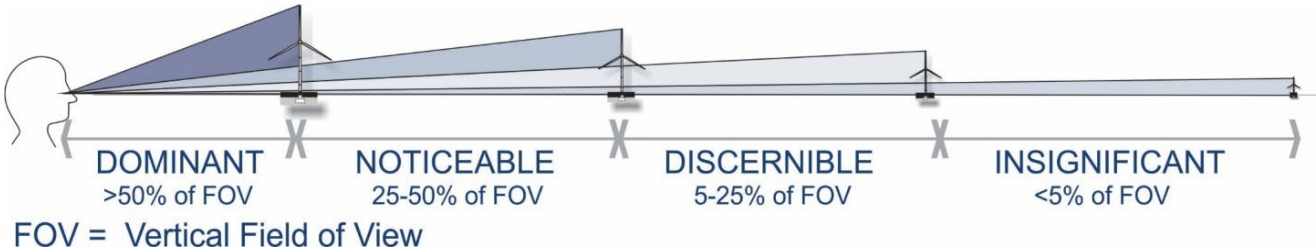


Figure 4-3 Zones of Visual Influence

Figure 4-4 shows the ZVI bands in relation to the Hexham Wind Farm up to the extent of the study area.

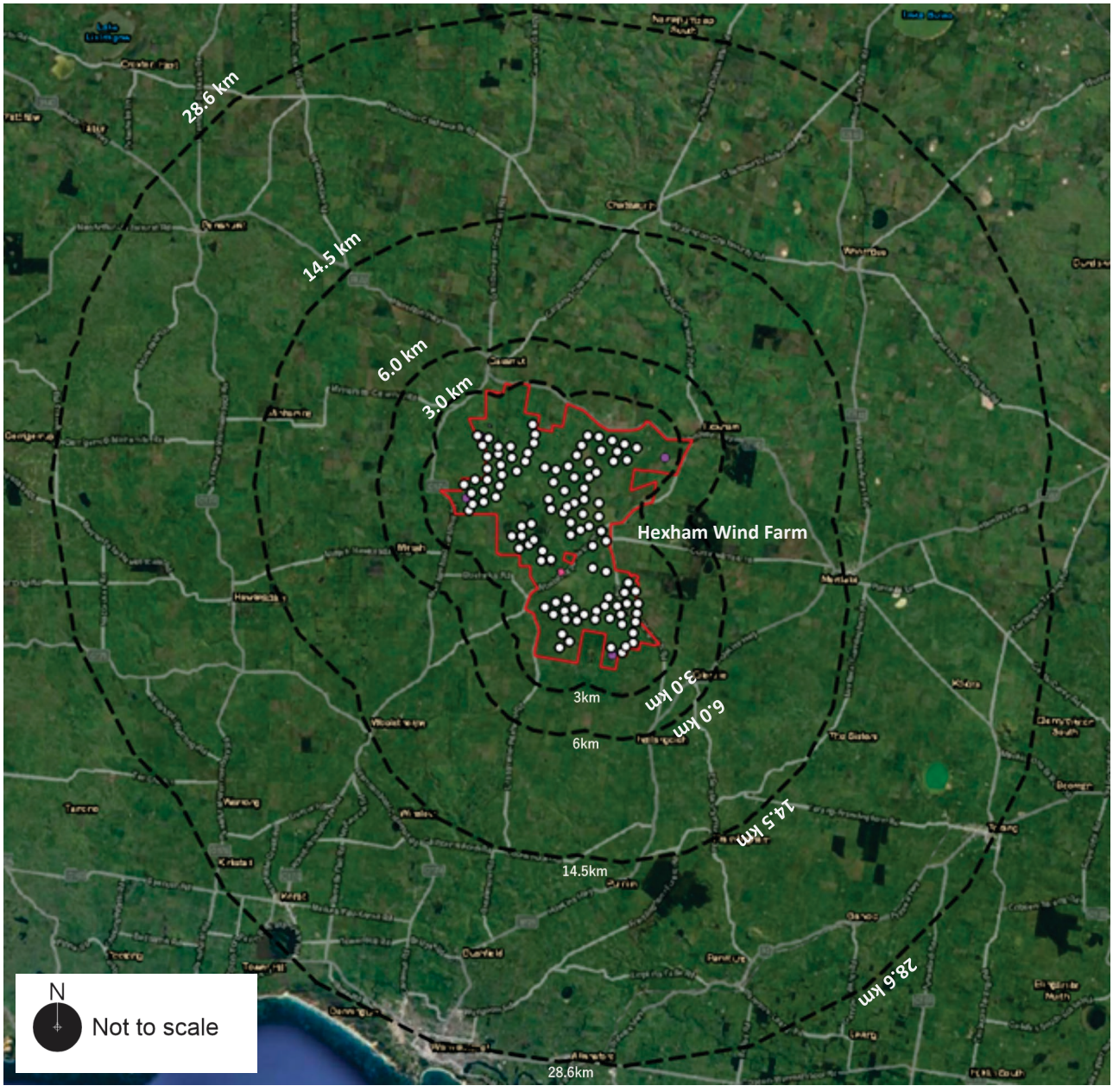


Figure 4-4: Zones of visual influence map

A 250 m high turbine may be a noticeable visual element to a distance of 28.6 km. On clear days, a 250 m high turbine may still visible beyond 28.6 km, however they would be a small element within views. This observation is supported by views taken from various distances in proximity to the Murra Warra Wind Farm, which includes turbines up to 220m to the tip of

the blade. Views captured as part of recent trials and empirical testing of this analysis are included in Appendix B of this report.

This preliminary landscape and visual impact assessment will consider the area within a 28.6 km radius of the preliminary WTG layout. The distance at which the proposed turbines would be most noticeable is within 6.0 km of the nearest WTG. Within this distance and where visible, the turbines have the potential to be highly visible and will usually dominate the landscape. The final Landscape and Visual Impact assessment will consider residential dwellings within this distance.

5. Community perceptions

Community held values and perceptions are an important part of the LVIA. Local communities feel most strongly about their local area. These landscapes and areas form part of their everyday lives. Locations that are intrinsic to local communities go beyond residential dwellings and place they live and include local parks, public lookouts and elevated locations and National Parks. These specific locations and values will firstly be identified through a desktop study and policy review which seeks to identify and protect such areas.

Community consultation and stakeholder engagement is an important process through which to identify locations that form part of the local communities and their connections to the region and to ensure that these locations are captured and assessed within the LVIA.

Photomontages and media platforms which assist the community and stakeholder to interpret the Project in views from their local areas is critical to meaningful and fruitful community engagement. Equally important is for photomontages and other imagery to be prepared from key areas and views that are relevant and familiar to local communities.

Photomontages have not been prepared for this preliminary assessment. Photomontages will be prepared as part of the final LVIA.

6. Planning Background

The majority of the study area of the proposed Hexham Wind Farm sits within the municipality of Moyne Shire Council. The outer edge of the study area to the north-west sits within the Southern Grampians Shire, the northern edge in Ararat Shire, south-eastern edge in the Corangamite Shire, and a small section to the south sits within the Warrnambool Council area.

This chapter seeks to understand the planning context of the Project with regard to the potential landscape and visual impacts.

6.1 State and Regional Planning Policy Framework

The State and Regional Planning Policy Framework (PPF) sets out broad policy objectives to ensure uniform and consistent application of the planning scheme.

6.1.1 Clause 12.05-2S Landscapes

The objective of this provision is to protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments. Key strategies include:

- *Ensure significant landscape areas such as forests, the bays and coastlines are protected;*
- *Ensure development does not detract from the natural qualities of significant landscape areas;*
- *Improve the landscape qualities, open space linkages and environmental performance in significant landscapes and open spaces, including green wedges, conservation areas and non-urban areas;*
- *Recognise the natural landscape for its aesthetic value and as a fully functioning system; and*
- *Ensure important natural features are protected and enhanced.*

Clause 21.06 (Environment) in the Moyne Shire PPF provides local content to support Clause 12 (Environmental and Landscape Values).

6.1.2 Clause 19.01-2S Renewable Energy

The objective of this provision is to promote the provision of renewable energy in a manner that ensures appropriate siting and design considerations are met. Key and relevant strategies include:

- *Facilitate renewable energy development in appropriate locations;*
- *Set aside suitable land for future energy infrastructure;*
- *Consider the economic and environmental benefits to the broader community of renewable energy generation while also considering the need to minimise the effects of a proposal on the local community and environment; and*
- *Recognise that economically viable wind energy facilities are dependent on locations with consistently strong winds over the year.*

Clause 21.08 (Infrastructure and Particular Uses) provides local context of this provision. However, it's noted that Clause 21.08 does not address the growing renewable energy sector, nor visual implications for infrastructure development.

6.2 Moyne Shire - Local PPF

6.2.1 Clause 21.03 Factors influencing future planning and development

This provision seeks to identify key factors which are of importance to the Shire's future land use and development. Specifically, it recognises the importance of landscape character and views throughout the area. Relevant factors include:

- *The Shire has a high quality historic built environment, a wide range of heritage places in towns and rural areas, towns of distinctive urban character, farmland of historic and landscape interest and rich aboriginal heritage;*

- *The importance of landscape character to the economy of the Region and the need to relate new development to landscape character;*
- *The need to retain the dominance of the landscape between townships, and avoid ribbon development;*
- *The importance of views of the landscape from road corridors, and the need to control and manage development that is highly visible from main road corridors and principal tourist routes; and*
- *The need to retain the dominance of the landscape from key viewing locations throughout the Region.*

6.2.2 Clause 21.06 Environment

The overview of this provision describes the Shire's changing land use and declining environmental condition since the introduction of agricultural land use and human settlements in the Shire.

The provision outlines landscape character elements (such as corridors and key views) and areas identified as having landscape character and significance. In regard to the significance of road corridors, the provision states:

> *The road corridors throughout the Shire pass through different landscape types and precincts, resulting in a variety of landscape experiences and scenery throughout the journey. The assessment and management of development that can be seen from main road corridors is therefore an important issue in the Shire.*

Regarding key views, the provision states:

> *There are a number of key viewing locations within the Shire that are frequented by tourists and visitors to the Region. These are mostly coastal views and include the steep sea cliffs and off shore formations at the Bay of Islands, at The Crags, Lake Yambuk and Tower Hill. The views, from these particular sites are key locations in Moyne and the protection and management of views from such popular and established viewing locations is a key issue within the Shire. It is very important to retain the dominance of the natural landscape from these key viewing points, and to ensure that any new development is assessed for its impact on the character of the landscape.*

6.2.3 Clause 22.02-7 Hilltop and Ridgeline Protection

This policy recognises the visual and environmental implications of development along natural hilltops and ridgelines that can detract from the attractiveness and environmental qualities of an area. Key objectives include:

- *To protect areas of environmental and visual significance from inappropriate development;*
- *To limit development on prominent ridges and hilltops;*
- *To encourage the protection and revegetation of landscape features; and*
- *To contribute to the protection of the environmental qualities of hill tops and ridgelines.*

6.3 Zone and overlays affecting the site

The entire site is within the Farming Zone (FZ). The site is also affected by Heritage Overlay HO37 (Stone Mileposts- Victorian Heritage Register reference no.1700) in the south west of the site and HO35 (Burchett Creek Bridge - Victorian Heritage Register reference no.1856) to the north west of the site. HO4 (Merrang Homestead) is located outside of the site boundary to the east of Woolsthorpe-Hexham Road.

6.3.1 Farming Zone

The purpose of the Farming Zone is:

- *To provide for the use of land for agriculture;*
- *To encourage the retention of productive agricultural land;*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture;*
- *To encourage the retention of employment and population to support rural communities;*

- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision; and*
- *To provide for the use and development of land for the specific purposes identified in a schedule to this zone.*

6.3.2 Heritage Overlay

The purpose of the Heritage Overlay is:

- *To conserve and enhance heritage places of natural and cultural significance;*
- *To conserve and enhance those elements which contribute to the significance of heritage places; and*
- *To conserve specified heritage places by allowing a use that would otherwise be prohibited if this will demonstrably assist with the conservation of the significance of the heritage place.*

6.4 Zones within the study area

The majority of land within the study area is within the Farming Zone (FZ).

Zones generally found within townships within the study area include Township Zone (TZ), General Residential Zone (GRZ), Commercial 1 Zone (C1Z), Rural Living Zone (RLZ), Public Park and Recreation Zone (PPRZ).

6.5 Overlays within the study area

There are several overlays within the study area that identify significant landscapes. These include SLOs and ESOs.

6.5.1 Significant Landscape Overlay (SLO)

The purpose of a Significant Landscape Overlay is:

- *To identify significant landscapes; and*
- *To conserve and enhance the character of significant landscapes.*

6.5.2 Moyne SLO1 – Mount Rouse Area of Natural Beauty

Statement of nature and key elements of landscape:

The environs of Mount Rouse are a significant landscape feature of the Shire. The views to and from Mount Rouse are of significance to the local community and tourists visiting the area. The environs are characterised by undulating rural land with areas of bushland and trees.

Landscape Character objective to be achieved:

- *To recognise and protect the natural beauty, interest and importance of the Mount Rouse area; and*
- *To protect the bushland and treed environment of the area.*

6.5.3 Moyne SLO6 – Tower Hill

Statement of nature and key elements of landscape:

Tower Hill is a visually outstanding volcanic landscape, having the full sequence of geological features including the caldera, crater lakes, internal scoria cones and islands. It is the most popular and well-known volcanic landscape in Victoria and is of state significance for its visual qualities.

The views from Tower Hill and its crater rim are remarkable, both across the surrounding plains to the coast, and within the complex to the crater floor and its island lakes. Its distinctive volcanic form, in an otherwise flat and featureless lava plain, make this a recognisable and highly prominent landscape feature of the Western Region.

Landscape Character objective to be achieved:

- *To increase the coverage of native and indigenous vegetation, both in corridors throughout the landscape, and associated with prominent landscape features such as Tower Hill;*
- *To ensure that shelter belt planting remains a feature of rural areas throughout the landscape;*
- *To protect locally significant views and vistas that contribute to the character of the landscape, such as extensive vistas to low dunes and the open hinterland from the Princes Highway, and spectacular long-range views to and from Tower Hill;*
- *To ensure that development in and around settlements and along main roads and touring routes does not impact on the characteristics of the landscape, including key views and viewing opportunities;*
- *To ensure that ridge tops and visually prominent hill faces are largely kept free of development;*
- *To ensure no visual clutter along the Princes Highway and abutting land;*
- *To retain a dominant pastoral and 'natural' landscape;*
- *To reduce the visual impact of infrastructure throughout the landscape;*
- *To protect landscape character and attributes that are consistent with the Aboriginal cultural heritage values of the area; and*
- *To recognise, and protect, the landscape of Tower Hill and environs as a place of significant Aboriginal cultural heritage value.*

6.5.4 Corangamite SLO1 – Volcanic Landscape Area

Statement of nature and key elements of landscape:

The Shire contains some of the State's most significant volcanic landscapes and features. These areas provide visual interest with variation in topography and vegetation and are to be protected from inappropriate development.

Landscape Character objective to be achieved:

- *To protect and enhance the visual and environmental quality and character of volcanic features, including crater lakes and scoria cones and their environs;*
- *To provide control over the visual impact of development on prominent volcanic features;*
- *To recognise the landscape, geological, biological, historical and recreational significance of volcanic features, including crater lakes, scoria cones and their environs; and*
- *To promote the siting and design of buildings and works, including the choice of building materials that is responsive to the character of the volcanic landscape.*

6.5.5 Ararat SLO2 – Mt Rouse

Statement of nature and key elements of landscape:

The Mt Rouse area has high environmental and landscape values which warrant protection.

Landscape Character objective to be achieved:

- *To recognise and protect the significance of the environmental and landscape values of the Mount Rouse area;*
- *To minimise the intrusion of development upon the landscape of Mount Rouse; and*
- *To protect natural resources including flora and fauna.*

6.5.6 Southern Grampians SLO2 – Mt Rouse and Crater Reserve

Statement of nature and key elements of landscape:

The Mount Rouse Crater Reserve is located at the Termination of the Mount Rouse Tourist Road, approximately five kilometres south of the township of Penshurst. The reserve consists of 63 Hectares around the summit of Mount Rouse, an extinct volcano that has a large crate in the centre.

The lower slopes of the reserve have had the indigenous vegetation denuded, and there are substantial plantings of Montery Pines (Pinus radiata) on the higher slopes, particularly on the north western and north eastern sides. There are some built structures within the reserve, a fire tower located on the summit, steps up to a lookout and car park. Major Mitchell named Mount Rouse in 1836, presumably after the early Sydney settler, Richard Rouse who established Rouse Hill. The Mountain was in the centre of the 100 square mile 'Reserve', which as the Mount Rouse Aboriginal Protectorate from the 1840s. The Protectorate failed and from about 1852 the township of Penshurst began to develop centred on the Protectorate's remaining buildings, now the Police Reserve. The current reserve dates from the 1850s, when land immediately around the crater was reserved as a "Public Park" and a water reserve. The Mount Rouse Reserve was formally gazetted in 1870. Plantings of exotic species, such as buffalo grass, Montery Pines and the removal of indigenous vegetation have led to serious erosion on the Mountain. A revegetation program started in the 1960s has halted this, planting a number of species of native trees and shrubs. Quarrying has been undertaken on the northeast face of Mount Rouse since the nineteenth century. The reserve is in good condition and retains a high degree of integrity.

The Mount Rouse Crater Reserve is of historical, social and aesthetic significance to the Southern Grampians Shire and to the township of Penshurst.

The Mount Rouse and Crater Reserve is of historical significance for its associations with the very early squatting run of John Cox and with the Aboriginal Protectorate. It is of continuing historical significance for its development as a cultural landmark through various planting programs. It is of social significance for its role as a recreation reserve. It is of aesthetic significance for its association with the homestead, Kolor and its landscaping, located on the western slope.

Landscape Character objective to be achieved:

- *To protect the appearance and presentation of the Mount Rouse Crater Reserve.*

6.5.7 Environmental Significance Overlay (ESO)

The purpose of the environmental significance overlay is:

- *To identify areas where the development of land may be affected by environmental constraints; and*
- *To ensure that development is compatible with identified environmental values.*

6.5.8 Moyne ESO3 – Mortlake Power Station Environs

Statement of environmental significance:

There is potential for noise generated by the power station to impact on any proposed sensitive uses and developments of land surrounding the power station site, particularly accommodation uses and developments.

If accommodation land uses and developments which are sensitive to potential noise emissions from the power station are permitted to be located in proximity to the facility this may result in real or perceived impacts and land use conflicts.

Environmental objective to be achieved:

- *To ensure that the development and use of the Mortlake Power Station is not constrained by the establishment of potentially conflicting accommodation uses and developments nearby;*
- *To ensure that potential noise impacts are considered in any decision regarding accommodation land use and development; and*
- *To apply acoustic measures in the design of any accommodation developments in proximity to the Mortlake Power Station.*

6.5.9 Corangamite ESO1 – Lake Keilambete

Statement of environmental significance:

These significant water bodies play an important part in the ecology of the Shire and need to be protected from inappropriate land use and development.

Objectives to be achieved:

- *To maintain the biological, physical and chemical quality and quantity of water within the watercourse, water body or wetland;*
- *To maintain the ability of streams and watercourses to carry natural flows;*
- *To prevent erosion of banks, streambeds and adjoining land and the siltation of watercourses, drains and other features;*
- *To protect and encourage the long-term future of fauna and flora habitats along watercourses;*
- *To ensure development does not occur on land liable to flooding;*
- *To prevent waste discharge, nutrients and other pollutants from entering watercourses and water bodies;*
- *To prevent increased surface runoff or concentration of surface water runoff leading to erosion or siltation of watercourses;*
- *To conserve existing wildlife habitats, close to natural watercourses and encourage regeneration of riparian and fringing vegetation;*
- *To minimise the potential damage caused to human life, buildings and property by flood waters;*
- *To restrict the intensity of use and development of land and to activities which are environmentally sensitive, and which are compatible with potential drainage or flooding hazards;*
- *To promote the use and environmental solutions in siting and design in preference to modification of natural systems through technical and engineering measures;*
- *To minimise the environmental impact on estuarine environments by controls over water releases and sand bar management in line with Southern Rural Water's established protocol;*
- *The natural role of wetlands in filtering nutrients and absorbing soluble pollutants in water shall be maintained. Further loss of wetlands through drainage will be discouraged; and*
- *To protect and ensure the long-term future of fauna and flora habitats in wetland and estuarine areas.*

6.5.10 Ararat ESO3 – Habitat Protection Areas

Statement of environmental significance:

Ararat Rural City contains a diverse range of remnant fauna and flora communities. These vital habitats have been identified in the map prepared by the Glenelg Hopkins and Wimmera CMA titled Sites of Biodiversity Significance in the Ararat Rural City January 2004.

Environmental objective to be achieved:

- *To protect rare or threatened species or significant habitats for native flora and fauna;*
- *To protect and enhance remnant native vegetation including understorey and ensure the long-term future of fauna and flora habitats;*
- *To ensure development does not impact on significant habitats;*
- *To restrict the intensity of use and development of land and to activities which are environmentally sensitive;*
- *To promote the use of environmentally benign solutions in siting and design in preference to modification of natural systems; and*
- *To promote the maintenance of ecological processes and generic diversity.*

6.6 Particular Provisions

Clause 52.32 (Wind Energy Facility) applies to land used and developed or proposed to be used and developed for a Wind energy facility to establish and expand wind energy facilities, in appropriate locations, with minimal impact on the amenity of the area. Section 4 Application requirements requires an application to provide a site and context analysis including specific information relevant to landscape and visual impact.

6.7 Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria (July 2021)

Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria (July 2021) (the Guidelines) is a reference document listed at Clause 52.32-6 (Decision guidelines). The Guidelines provide operational performance standards to inform the assessment and operation of a wind energy facility. Visual impact is considered under Section 5.1.3 of the Guidelines.

The *Policy and planning guidelines for the development for wind energy facilities in Victoria* were amended in July 2021 and state that:

> *'Wind energy facilities will have a degree of impact on the landscape.*
>
> *A responsible authority needs to determine whether or not the visual impact of a wind energy facility in the landscape is acceptable. In doing so, they should consider planning scheme objectives for the landscape, including whether the land is subject to an Environmental Significance Overlay, Vegetation Protection Overlay, Significant Landscape Overlay or a relevant strategic study that is part of the relevant planning scheme.*
>
> *The visual impact of a proposal should have regard to relevant state and local government planning policy.'*

6.8 South West Victoria Landscape Assessment Study

The South West Victoria Landscape Assessment Study – Landscape Character of South West Victoria by DPCD & Planisphere, June 2013 identifies the landscape character types in South West Victoria.

While the SWVLAS is not a referral document under the Planning Scheme, its implications for this assessment are deliberated on. The Western Volcanic Plains (Character Type 1) is the main character type identified within the study area of the proposed Hexham wind farm. The location of these character types and the study area of the Wind Farm are shown in Figure 6-1.

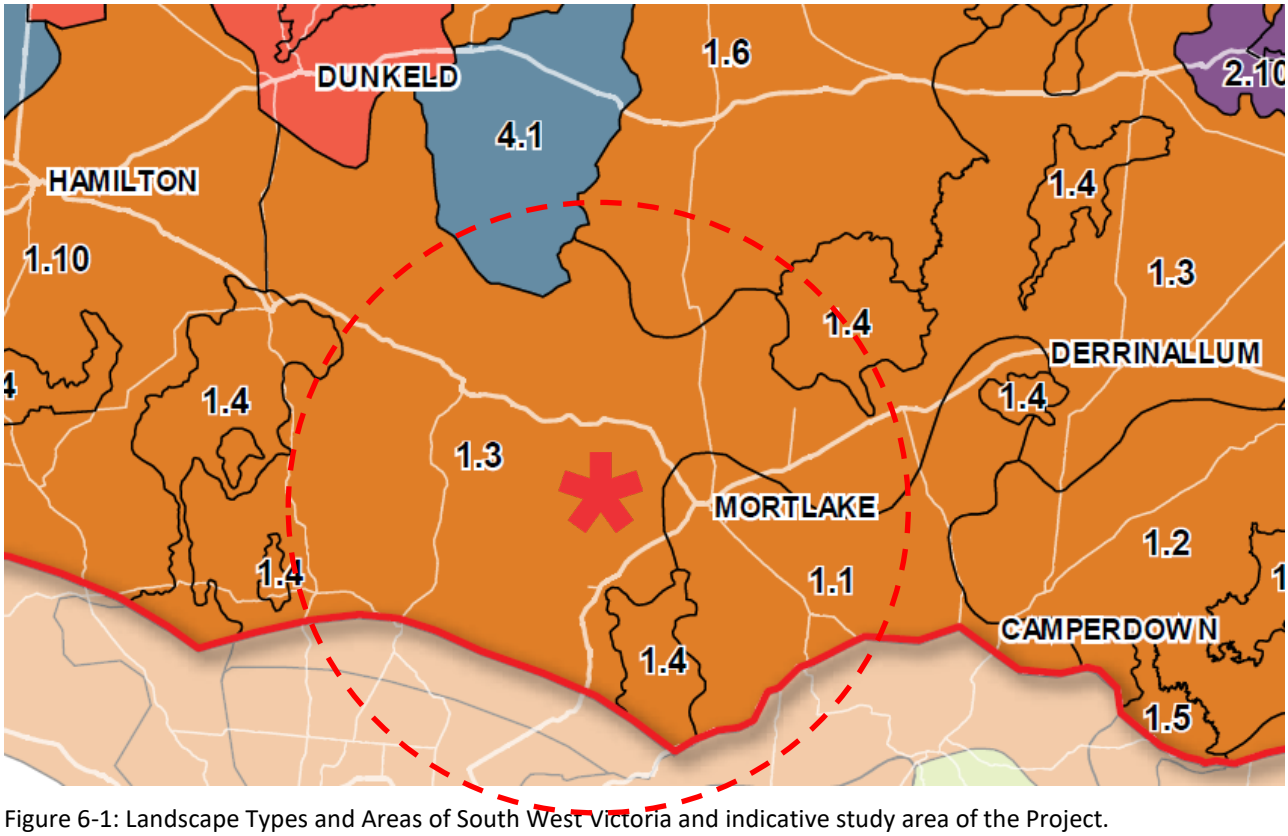


Figure 6-1: Landscape Types and Areas of South West Victoria and indicative study area of the Project.

6.8.1 Character Type 1 - Western Volcanic Plain Landscape

The Landscape Character Types & Areas Analysis Papers, Planisphere June 2013 included in the SWVLAS describe the study area of the proposed wind farm as being located within the Western Volcanic Plain Landscape Character Type and is described as follows:

The fertility and cleared nature of the Western Volcanic Plains were ideal for grazing. The region became very wealthy and was dominated by large pastoral properties. These large properties often had extensive exotic gardens as the new settlers aimed to recreate their familiar British landscapes.

The landscape that we see today represents a hybrid of generally undisturbed underlying topography with patchwork remnants of the natural landscape, which are protected by national, and state parks. Intertwined with this lies the heavily modified landscape of exotic shelterbelts, dry stonewalls, farming, infrastructure, rural development and wind farms.

The Western Volcanic Plains has the following sensitivity to change:

The volcanic plain is highly sensitive to change, the flat nature of the plain offers long range views and thus creates a landscape on which there is 'nowhere to hide'. There is limited capacity for this character type to absorb development without is becoming prominent in the viewed landscape.

However, balanced against this is the degree to which this landscape has been modified, shaped by man over generations.

The four landscape character areas that fall within the study area are:

Character 1.1 – Paddocks and Cones. Key features identified are:

"High concentration of volcanic cones numerous well-preserved dry-stone walls and cleared agricultural land."

Character area 1.3 - Volcanic agricultural. Key features identified are:

"Open pastoral landscape with long distance views; Exotic shelterbelts and Stands of remnant vegetation.

Character area 1.4 - Stony rises and lava flows. Key features identified are:

"Geology and geological features, Starkness and rough texture of the landscape, Exposed rocky outcrops and sinkholes and Textural contrast with adjacent paddocks.

Character area 4.1 - Eastern Tablelands. Key features identified are:

"Rolling topography containing river valleys with rounded plateaus that contrast with the surrounding flat volcanic plain. Heavily cleared paddocks, vegetation concentrated along creek lines and roadsides. Exotic and native shelterbelts planted along paddock edges and property lines. Occasional granitic outcrops and rocks strewn throughout paddocks"

6.8.2 Significant Landscapes and Views

The SWVLAS identifies several significant landscapes and views within the study area of the wind farm as shown in Figure 6-2.

SWVLAS significant landscapes

The Southern Cones unit associated with Mount Rouse lies at the north western edge of the study area. It has been identified within the State level significant landscape. The Southern Cones unit is described as follows:

These volcanic features rise up dramatically from the open and slightly undulating agricultural plain. Many of them are visible on the horizon from long distances away and create a high level of contrast and visual interest in the landscape. The lakes in the area provide additional wide, flat surfaces that further highlights the prominence of the cones. Geometric shapes of shelterbelts and property edges run at sharp angles to the features.

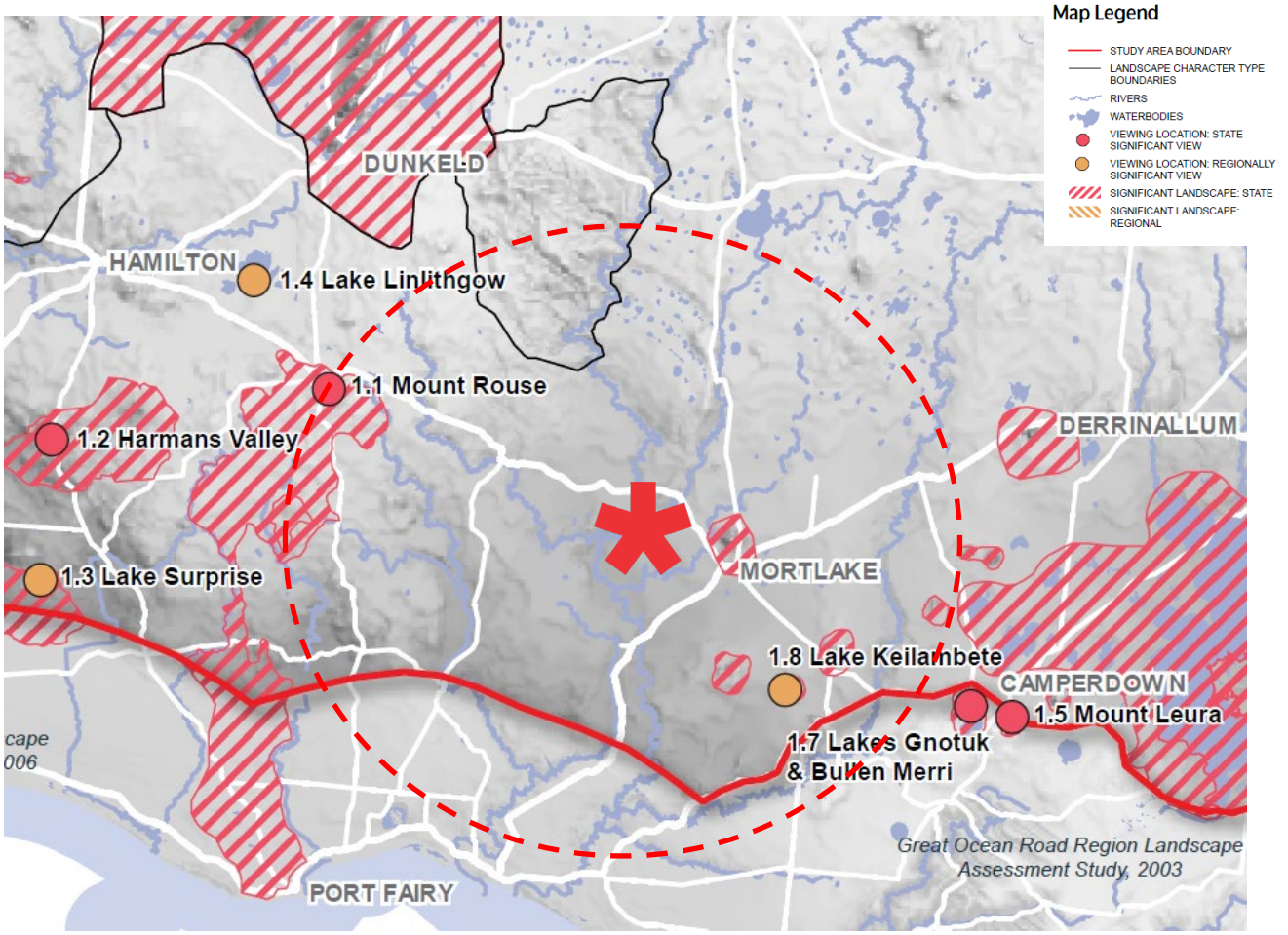


Figure 6-2: View locations of State & Regional Significance as well as areas of Significant Landscapes and the indicative study areas of the Project

SWVLAS significant views

The SWVLAS identifies the view from Mount Rouse as being a State Significant View and the view from Lake Keilambete as a Regional Significant View.

Mt Rouse

The Mount Rouse Lookout provides almost 360º 'picture postcard' views across the roughly textured lava flow and surrounding district. These are available from a number of locations on the summit.

Views from the summit of Mount Rouse are panoramic, with the foreground and middle ground stretching out across the lava plain towards a backdrop of the Grampians. Paddocks are criss-crossed with dark green shelterbelts and the nearby volcanic rises of Mount Napier and Mount Eccles (Budj Bim) can be seen. It is also possible to view the extent of the rocky lava flow as it makes its way south, creating a rough, lumpy texture across the agricultural field patterns.

Lake Keilambete

Lake Keilambete is an almost circular lake with startling blue waters that provides a stunning foreground for Mount Noorat on the horizon. A small interpretive sign denotes this significant viewing location. Views to the west and south/west are actually blocked by shelterbelt planting on site.

Lake Keilambete is not immediately discernible to the eye, as it nestles in a deep crater. Where Keilambete Road edges the lake, views are predominantly blocked by dense roadside vegetation. A break in the vegetation on the south western edge opens up to reveal the sparkling blue water of the lake. From this point cleared, grassy banks slope down to the water's edge and the almost perfectly circular formation of the lake is visible. The view is contained within this deep recession, with the raised sides (or 'tuff' ring) blocking outward views. Mount Noorat is centred in the view on the horizon.

The key views from Lake Keilambete are towards Mount Noorat and away from the proposed Project.

6.8.3 Implications of SWVLAS

The SWVLAS recognises and values the geological formations that occur within the landscape of the Western Volcanic Plains and therefore increasing the landscaping sensitivity. However, it also recognises the change that this landscape has undergone since European settlement and the anticipated increased level of development suggesting lower landscape sensitivity.

Most significant features within the Western Volcanic Plain are geological formations that remain intact even after extensive modifications such as farming and development of infrastructure such as power lines, wind farms and the built environment.

6.9 Planning Implications

The Planning Policy Framework puts in place measures to protect natural features, scenic qualities and prominent views and vistas across the project study area. These include volcanic cones such as Mount Rouse and Tower Hill. These features sit on the outskirts of the study area. Views from these locations are discussed in Section 8.5.

7. Landscape Character

Landscape Units are based on areas with similar visual characteristics in terms of topography and features, such as creeks and drainage lines, soil, vegetation and land use. The following sections describe the underlying patterns of these elements to derive the landscape units within the view shed.

Within the project boundaries, the vast majority of land is utilised for cropping and grazing.

7.1 Topography

The project and study area are located within the Western Volcanic Plains. The topography within the view shed is predominantly gently undulating with low rises, punctuated with volcanic cones.

7.2 Vegetation

The newer volcanic landscapes of Western Victoria have undergone many changes since European settlement. The most noticeable change has been the clearing of native vegetation, grasslands and swamps which were replaced with exotic pasture grasses.

The majority of taller vegetation and trees is confined to roadsides, fence lines, property boundaries and wind breaks as well as watercourses and natural drainage lines. This taller vegetation varies in height. Visual permeability varies between natives which are general tall with clear trunks allowing views through the underside of the tree canopies to full height screening provided by exotic wind breaks such as cypress and other pines.

Figure 7-1 shows an example of native planting along property boundaries within the study area.

Figure 7-1: Native Vegetation

Although clear trunked, native trees provide filtering of views from roadways and private vantage points, with tree canopies providing filters and screening of hubs and turbine blades at close distances.

Figure 7-2 shows an example of native trees alongside exotic cypress and other pines found within the study area.

Figure 7-2: Vegetation example

Figure 7-2 shows the visual screening and view filtering characteristics of native and exotic trees commonly found in the Project study area. These characteristics, along with vegetation height support landscape character considerations, they also support observations regarding filtering and screening of existing views from key public viewing locations and mitigation of views from residential dwellings.

7.3 Landscape Units and Sensitivity

Three landscape units have been identified within the study area of the Project. These are:

- Rural Communities and Townships Landscape Unit
- Farmland Landscape Unit
  - Plains
  - Stony Rises
- Volcanic Cones Landscape Unit
- Lakes and Waterways Landscape Unit

7.3.1 Landscape Unit 1 – Rural Communities and Townships

Landscape Unit 1 – Rural townships describes the small rural townships within the study area. Rural townships are characterised by a cluster of residential dwellings around a main street with shops. Some townships have parks and reserves as well as community orientated buildings.

Vegetation located within rural communities and townships are typically located within road reserves and residential gardens.

Figure 7-3: Landscape Unit 1 – Rural Communities

7.3.2 Landscape Unit 2 – Farmland

Landscape Unit 1 – Farmland are areas used primarily for agricultural purposes. This landscape unit includes two sub-units, 'The Plains' and 'Stony Rises'.

Sub-unit 2A – 'The Plains'

The plains are characterised by gentle slopes and are derived from scoria basaltic flows, alluvial or sedimentary origins.

This landscape unit is predominantly cleared with remnant patches of vegetation occurring along natural drainage lines and creeks, interspersed with shelterbelt planting and hedgerow planting.

Figure 7-4: Landscape Unit 1A – 'The Plains'

Sub-unit 2B – 'Stony Rises'

The stony rises are characterised by basalt rocks scattered throughout the farmland landscape. This landscape unit has a higher visual sensitivity to that of 'The Plains' as the presence of tumbled blocks and rock walls provide a visual contrast to the surrounding landscape.

Figure 7-5: Landscape Unit 2B – 'Stony Rises'

7.3.3 Landscape Unit 3 – Volcanic Landscapes

Tower Hill, Mount Rouse, Mount Noorat and Mount Shadwell are volcanic cones that occur within the study area. Volcanic cones rise above the surrounding plains and feature in views from the surrounding plains.

Mt Rouse is a volcanic cone located approximately 22km to the nearest proposed WTG and is identified within the SWLAS as a state significant viewing location.

Figure 7-6: Landscape Unit 3 – Volcanic Cones

7.3.4 Landscape Unit 4 – Lakes and waterways

These areas are highly valued for their amenity and recreational uses. There are few lakes and waterways located within the study area.

Figure 7-7: Landscape Unit 4 – Lakes and waterways

7.4 Landscape Sensitivity

Landscape sensitivity is in part a measure of the ability of a landscape to absorb visual change based on attributes of a particular landscape. The sensitivity of the previously described landscape units will depend upon a number of attributes, such as:

- **Location.** The sensitivity of a potential viewer varies according to location. For example, visitors to a National Park where the landscape appears untouched or pristine would be more sensitive to the imposition of new or artificial elements within that landscape. The same viewer travelling along a rural highway, which contains existing examples of modifications and artificial elements, would be less sensitive to the presence of new elements. Modifications or artificial elements are not confined to vertical structures or built form, they also include removal of native vegetation; and visibility of roads, tracks, fences and other rural infrastructure, all of which decrease the sensitivity of a landscape to further change.

- **The rarity of a particular landscape.** Landscapes that are considered rare or threatened are valued more highly by viewers.

- **The scenic qualities of a particular landscape.** Landscapes that are considered scenic are also those that are considered sensitive. They often contain dramatic topographical changes, the presence of water, coastlines, and other comparable features. The presence of modifications or artificial elements (including built form, roads, tracks, fences, and silos), as well as farming practices including land clearing and cropping decrease the sensitivity of a landscape's scenic qualities.

The landscape within the study area includes many constructed elements including dwellings, structures and sheds, power infrastructure and other interventions.

The landscape sensitivity of a Farmland Landscape Unit that has been highly modified is considered low. It is not a rare or threatened land-use or character and common across a large area of Victoria. This landscape undergoes visually apparent change both on a regular basis and progressively over time. Rural activities such as grazing, tractors, crop cycles and other farming changes associated with farming and agriculture are constant reminders of human influence on the landscape. However, it is recognised that some people value the cleared farmland with minimal signs of mechanised construction such as houses, farm sheds and the like. The presence of structures may be perceived as a high visual impact due to the presence of large-scale structures on a rural landscape to these viewers, notwithstanding that the landscape is already highly modified by human activity.

The Rural Communities and Townships Landscape Unit is considered to have a moderate level of sensitivity to further visual change. This is due in part to the higher number of residents and therefore people who may view the alteration, the extent of visual modifications already brought about by the establishment of those area and the presence of similar

infrastructure. Views from these areas are to the surrounding landscape are usually screened or filtered by buildings, and vegetation.

Table 7.1 sets out the sensitivity of the various landscape units within the study area of the Project.

Table 7.1: Landscape Units

Landscape Unit	Sensitivity
Landscape Character Unit 1 – Rural Communities / Townships	**Moderate-High:** Land clearing, built form and other visual elements reduce the visual sensitivity of these areas.
Landscape Character Unit 2a – Plains Farmland	**Low:** Highly modified, contains visible infrastructure, is not topographically dramatic and does not contain large bodies of water.
Landscape Character Unit 2b – Stony Rises Farmland	**Low-Moderate:** This landscape unit has a higher visual sensitivity to that of 'The Plains' as the presence of tumbled blocks and rock walls provide a visual contrast to the surrounding landscape.
Landscape Character Unit 3 – Volcanic Landscapes	**High:** At a higher elevation to the surroundings, this unit offers views to both natural and constructed elements and are unique elements especially within the surrounding plains.
Landscape Character Unit 4 – Lakes & Waterways	**Moderate-High:** These areas are highly valued for their amenity and recreational uses.

The landscape units and sensitivity ratings will form the basis of the visual impact of views from publicly accessible locations.

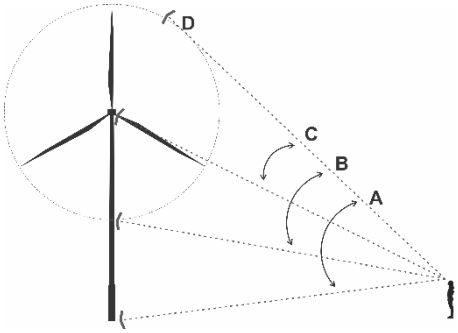
Landscape sensitivity from individual residential properties will always be assessed as "high" as for a resident, their home will always be a highly sensitive location and disturbances to a resident's views must always be considered to have the highest degree of sensitivity.

8. Seen Area Analysis

Seen Area Analysis (SAA) or visibility mapping identifies locations that may have views to the project. The SAA is a theoretical model that is based on the physical characteristics of key project infrastructure and the topography of the surrounding landscape. The SAA does not include features that are typically found in the landscape such as vegetation, cultural plantings, buildings and structures that might assist to screen or filter views.

The SAA provides a conservative basis from which to select a range of representative viewpoints to understand the range and scale of the overall visual impacts that might be brought about by the Project.

The Seen Area Analysis can firstly map those areas from which WTGs may be visible in whole or part.

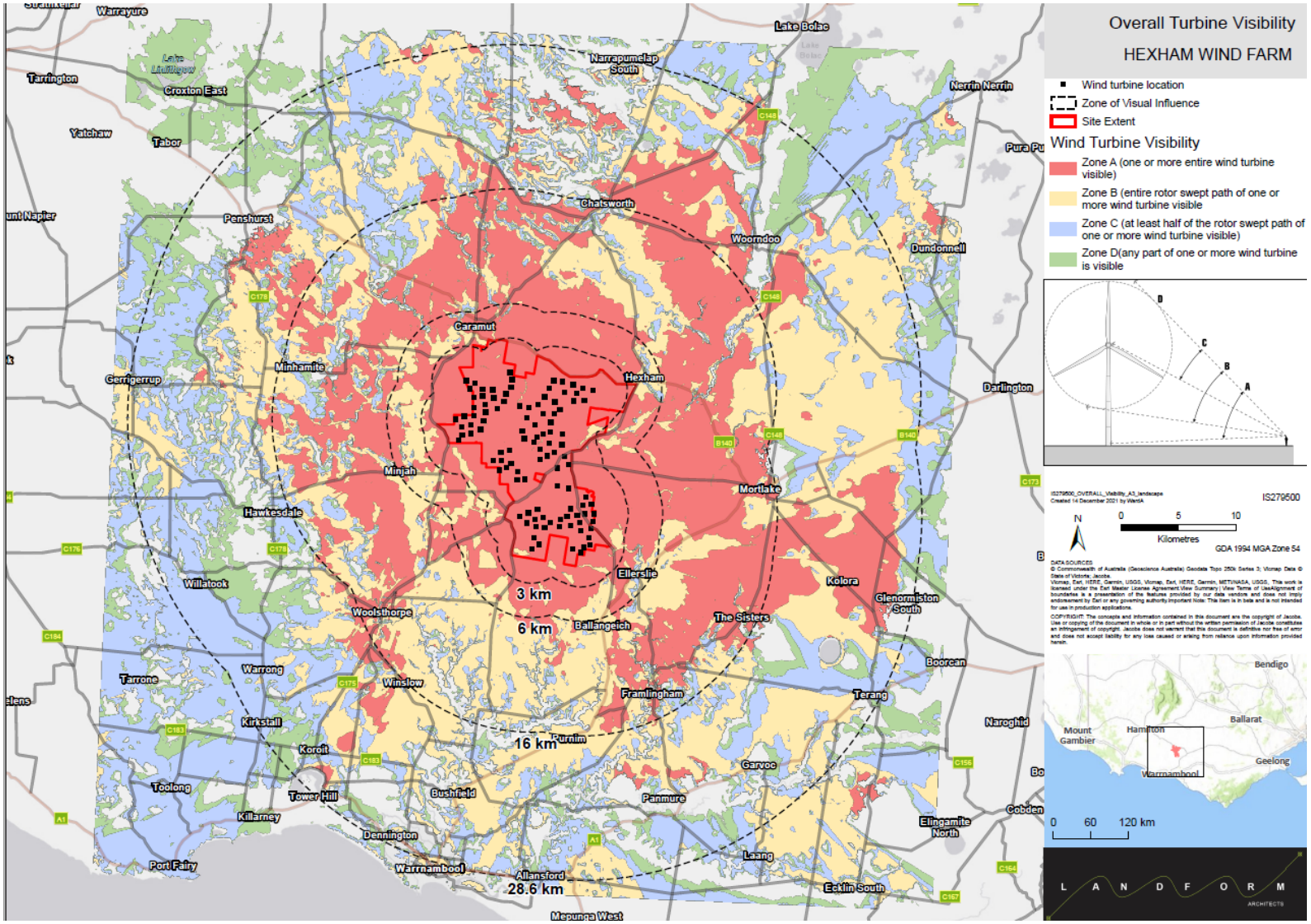


- Zone A – Areas from which one or more WTGs are visible in their entirety;
- Zone B – Areas from which the entire swept path of one or more WTGs are visible;
- Zone C – Areas from which nacelle and above of one or more WTGs are visible; and
- Zone D - Areas from which tip of the blade of one or more WTGs are visible.

Figure 8-1: Visibility parameters (not to scale)

Zone A includes locations that have the potential to view a WTG in its entirety, the viewer at this location will theoretically be able to see “any part of the WTG blades” which includes Zone B, C and D.

Figure 8-2 shows the GIS-based mapping of Zones A, B, C and D.


Overall Turbine Visibility
HEXHAM WIND FARM
Wind turbine location
Zone of Visual Influence
Site Extent
Wind Turbine Visibility
Zone A (one or more entire wind turbine visible)
Zone B (entire rotor swept path of one or more wind turbine visible
Zone C (at least half of the rotor swept path of one or more wind turbine visible)
Zone D(any part of one or more wind turbine is visible
D
C
B
A
IS279600
N
0 5 10
Kilometres
GDA 1994 MGA Zone 54
3 km
6 km
16 km
28.6 km
Warrayure
Lake Bolac
Tarrington
Croxton East
Yatchaw
Tabor
Narrapumelap South
Nerrin Nerrin
Penshurst
Chatsworth
Woorndoo
Dundonnell
Caramut
Minhamite
Gerrigerrup
Hexham
Darlington
Minjah
Mortlake
Hawkesdale
Willatook
Ellerslie
Kolora
Glenormiston South
Woolsthorpe
Ballangeich
The Sisters
Tarrone
Warrong
Winslow
Framlingham
Terang
Boorcan
Kirkstall
Purnim
Naroghid
Koroit
Garvoc
Toolong
Tower Hill
Bushfield
Panmure
Killarney
Dennington
Cobden
Elingamite North
Port Fairy
Warrnambool
Allansford
Laang
Eckliin South
Mepunga West
Bendigo
Ballarat
Mount Gambier
Hamilton
Geelong
Warrnambool
0 60 120 km

The mapping of WTGs in their entirety or the areas from which a blade tip is visible is not indicative of overall visibility. Mapping for Zone A (whole of turbine) is too narrow or limiting as this excludes large areas within the study area that may still see part of a turbine, and Zone D (tip of blade) too broad. Mapping for Zones B (swept path) and zone C (nacelle and above) are the most useful when selecting viewpoints in which to assess the likely visual impact of the Project.

Figure 8-2 shows the mapping for Zone C, this maps those areas where a viewer can potentially see the nacelle and above. That is the nacelle and upper portion of the swept path of the WTG blades. This Zone is the most useful for guiding the selection of viewpoints on which to assess the visual impact of a wind farm project. The mapping for all the zones is included in Appendix A.

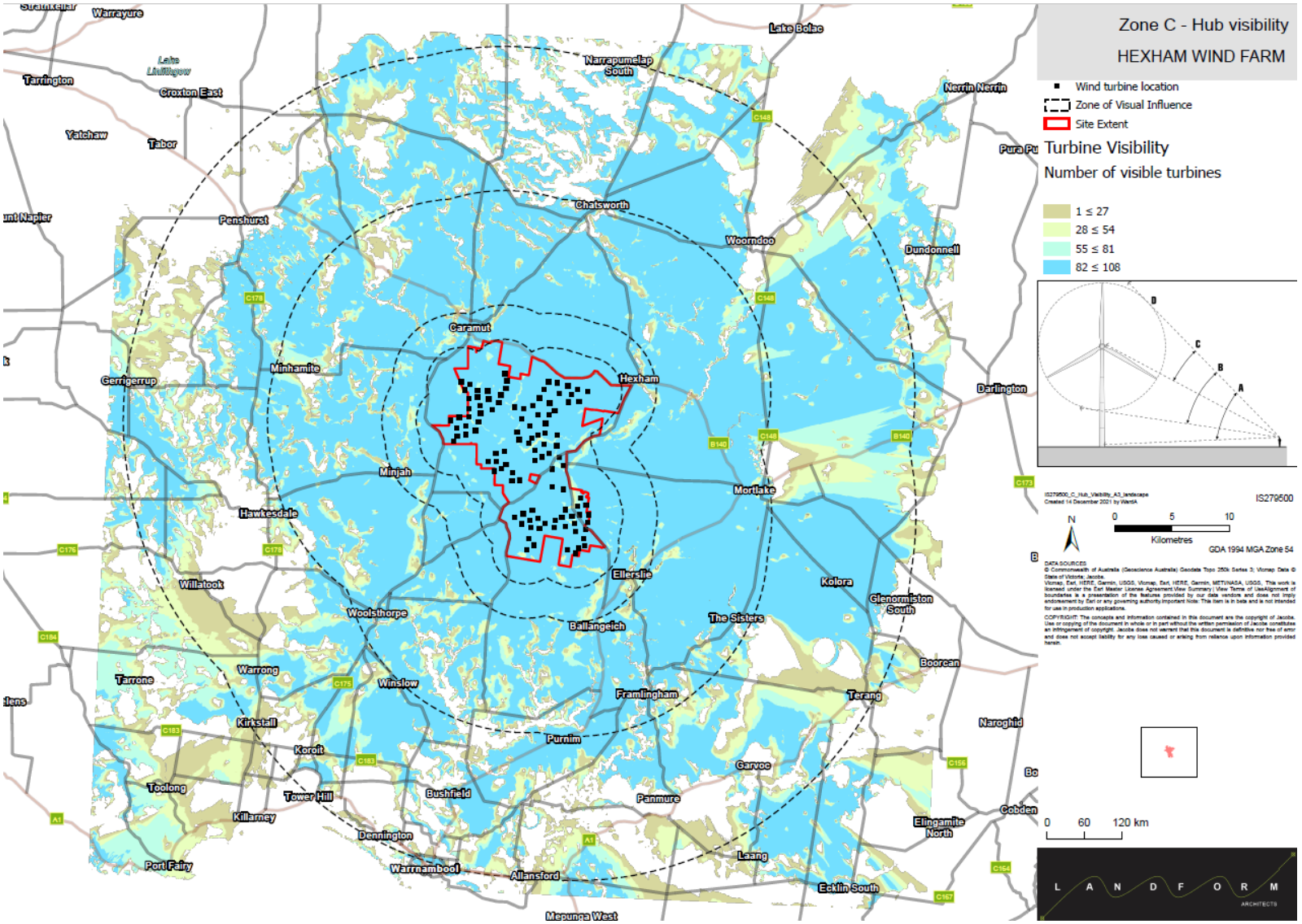


Figure 8-3: SAA -Zone C (Nacelle and above)

The theoretical visibility map for Zone C (Nacelle and above) shows that due to the flat nature of the subject site and surrounding area, the areas that have the potentially to see the majority of the proposed WTGs would in all directions from the proposed wind farm. These areas are predominantly within land zoned Farming Zone.

It is emphasised that this modelling is theoretical and does not consider vegetation seen in many areas across the project study area.

This mapping has assisted in the selection of viewpoints discussed in the following section.

9. Publicly Accessible Viewpoints

This section will assess the potential visual impact of the proposed Hexham Wind Farm from publicly accessible locations. This section of viewpoints seeks to provide a representative view from the publicly accessible areas within the study area.

Viewpoints have been selected based on areas that are considered to be potentially sensitive, take in views of significant features, view or outlooks or assist to consider the range of viewing angles, viewing distances and settings from locations within the study area.

9.1 Viewpoint locations

23 viewpoints have been selected as representative of the publicly accessible locations in and around the wind farm. Figure 9.1 shows the locations of each of these viewpoints.

The majority of viewpoints are within 10-15km of the proposed WTGs. Beyond this distance the proposed WTGs would not be as noticeable and therefore viewpoints have been selected where the visual impact would potentially be the greatest (Refer Section 4 – Study area).

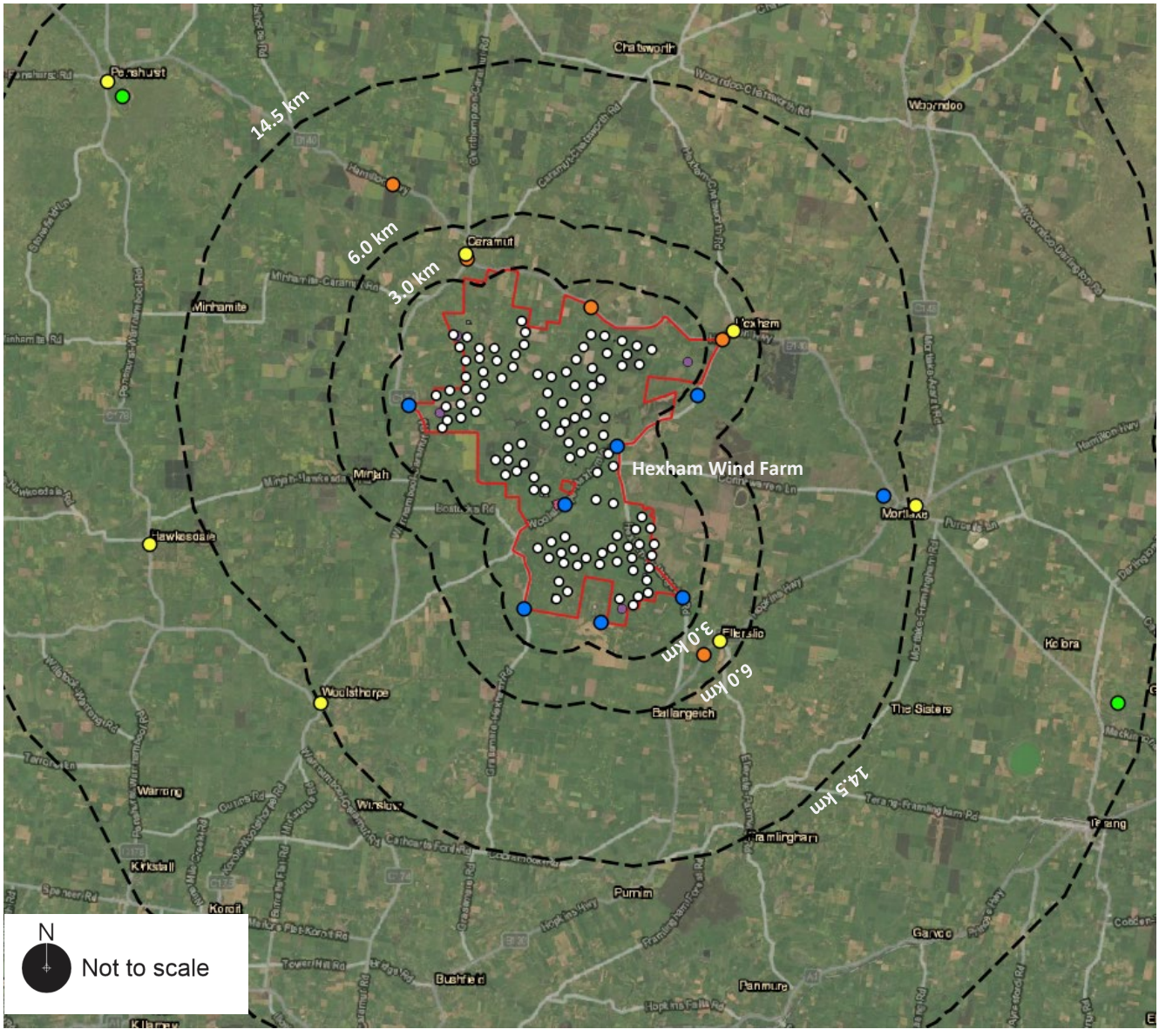


Figure 9.1: Overall Viewpoint Map

The turbine locations are shown in white. The location of the proposed meteorological masts is shown in purple.

Viewpoints have been grouped to assist with the assessment of areas set out in the National Wind Farm Guidelines which require the consideration of views from townships and urban areas, significant conservation and recreation areas, National Parks and State forests, water features, tourist routes and walking tracks and major roads. In doing so, these groupings also assist to discuss and ascertain the overall visual impact from different areas or locations. For these reasons the 23 viewpoints are set out under the following groupings:

- Viewpoints shown in green are views from Significant Landscapes - Volcanic Cones (Viewpoint V1-V3)
- Viewpoints shown in yellow are views from Townships (Viewpoints T1-T7)
- Viewpoints shown in orange are views from Major Roads (Viewpoints M1-M5)
- Viewpoints shown in blue are views from Local Roads (Viewpoints L1-L8)

Viewpoints have been selected from locations where the SAA has demonstrated potential visibility of the Project based on topography only or from locations considered to be of significance to the local community and user groups.

A summary of the quantitative criteria such as distance, viewer numbers and landscape sensitivity are set out in a summary table at each viewpoint. This is not to be relied upon for the determination of the overall visual impact as the qualitative criteria such as landscape sensitivity, features in the view and mutable factors such as screening provided by local topography, vegetation and buildings which cannot be captured or summarized through metrics are not accounted for. For this reason, the key considerations which have contributed to the overall visual impact arrived at for each viewpoint are described in the qualitative assessment above the summary table.

9.2 Significant Landscapes - Volcanic Cones

It is a requirement of the Victorian Wind Farm Guidelines set out in 52.32 Wind Energy Facility to consider the potential for impacts on views and amenity from significant conservation and recreation areas, water features, tourist routes, and walking tracks. This section will review the views and visual impact from such locations within the Project study area.

The selected viewpoints are recognised landscapes, features, or vantage points, and were identified as having potential visibility of the Project.

There are no National Parks, State Forests or Scenic Routes located within the study area. Three viewpoint locations (V1-V3) have been selected as representative of the visual impact on viewers from the significant landscapes which are three volcanic cones within the study area. Viewer numbers would be assessed as low while the landscape sensitivity would vary depending on the location of the viewpoint.

Each viewpoint location is shown in Figure 9.2 and the corresponding GPS co-ordinates and distances to the nearest WTG are listed below in Table 9.1.

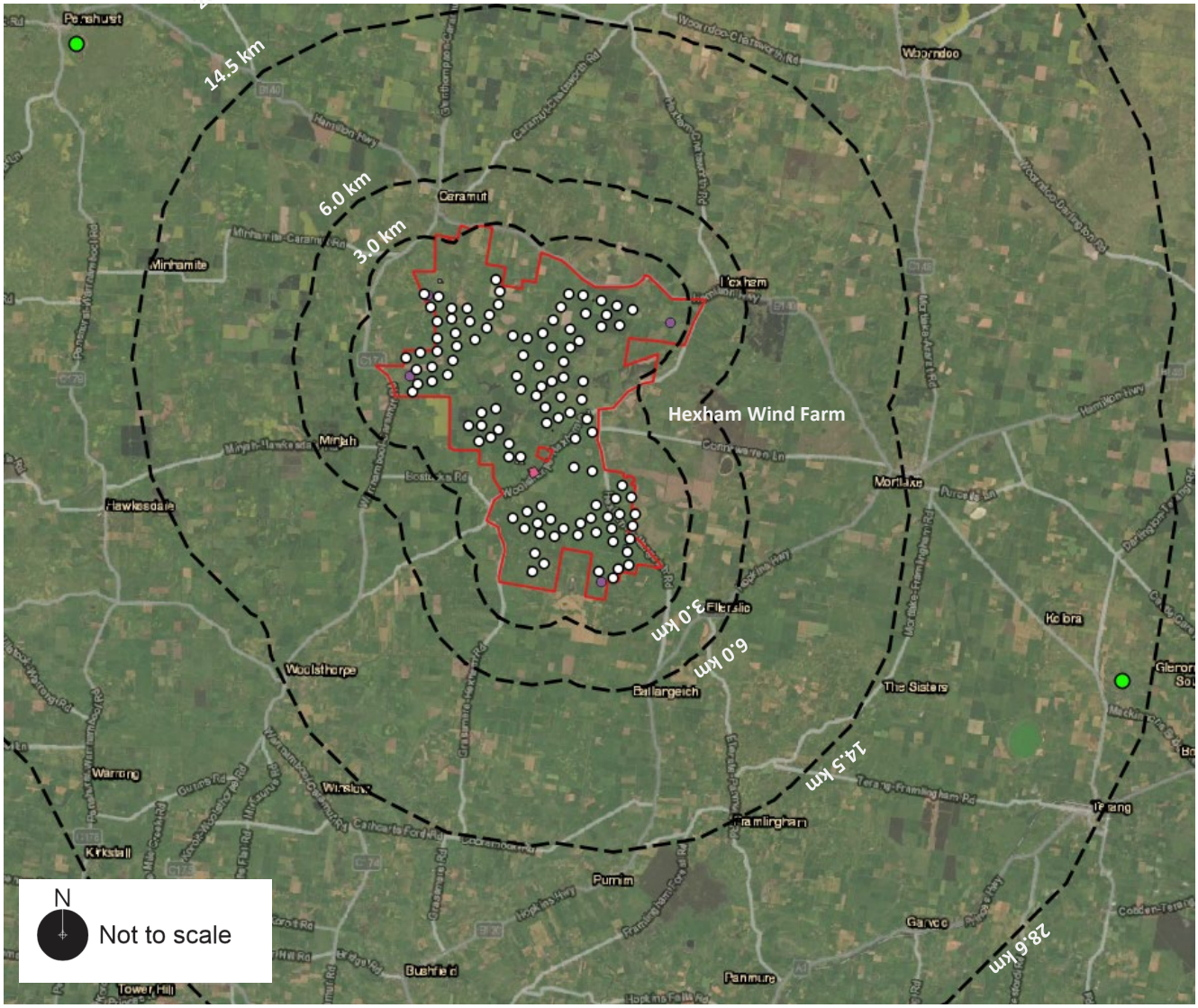


Figure 9.2: Significant Landscapes - Volcanic Cones Viewpoint Locations

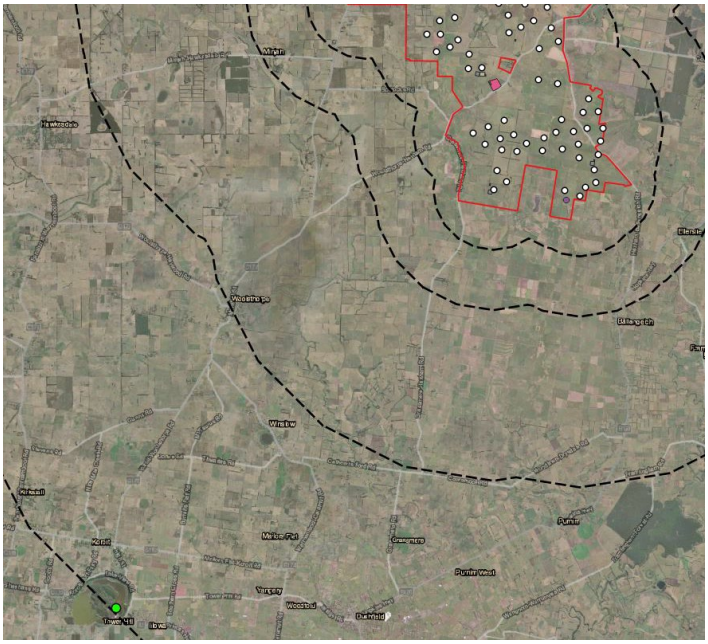
Table 9.1: Volcanic Cones Viewpoint Locations

VP	Location	GPS Co-ordinates	Distance and Direction to nearest WTG	Landscape Character Unit
V1	Tower Hill	54H 619647, 5757688	28km NE (T49)	Unit 3
V2	Mount Rouse	54H 614358, 5806419	22.6km SE (T6)	Unit 3
V3	Mount Noorat	54H 669619, 5772737	26.8km NW (T103)	Unit 3

9.2.1 Viewpoint V1 – Tower Hill

Viewpoint V1 is located on Tower Hill. The closest WTG (T49) would be approximately 28km north-east.

Figure 9.3 shows the view looking north-east towards the Project from the entry road to Tower Hill.



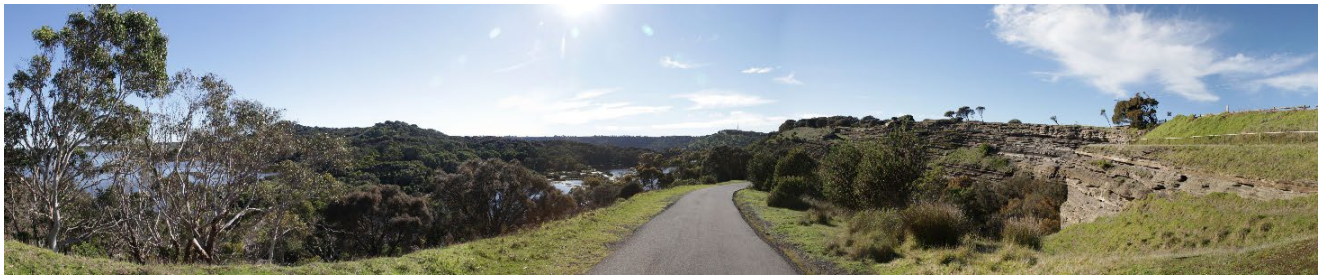


Figure 9.3: Viewpoint V1 – Existing view looking north-east from the entry road

The entrance road to Tower Hill reserve descends from the entrance into the crater lake. Views towards the Project from the entry road would be screened by existing topography and vegetation.

Figure 9.4 shows the view looking north-east from the entrance roads further within Tower Hill Reserve.

Figure 9.4: Viewpoint V1 – Existing view looking north-east from within Tower Hill reserve

As noted above, views from locations further into the reserve, such as that shown in Figure 9.4 are low in the landscape next to the lake within the Tower Hill Reserve. Views of the proposed WTGs would be screened by existing topography and vegetation within the Tower Hill Reserve.

Figure 9.5 below shows the view looking north-east from Tower Hill Road, approximately 40m east of the intersection with Lake View Road.

Figure 9.5: Viewpoint V1 – Existing view looking north-east from Tower Hill Road

This is view is taken from the edge of Tower Hill, outside of the reserve and is one of the only clear views towards the Project.

Most views would be screened by topography and vegetation or would be at a distance of approximately 28km the proposed WTGs would not be discernible and would not be a dominant element in the view.

For these reasons the visual impact is assessed as **Negligible-Nil.**

VIEWPOINT V1 – Tower Hill (54H 619647, 5757688)			
Distance	**Nearest Project WTG:** 28km NE (T49)	**ZVI**	**Potentially noticeable, but will not dominate the landscape**
Landscape Unit	Unit 3 – Volcanic Landscapes	**Sensitivity**	High
Viewer Type	Tourist Lookout	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE-NIL**		

9.2.2 Viewpoint V2 – Mount Rouse

Viewpoint V2 is located on Mount Rouse. Mt Rouse is a volcanic cone located on the edge of the wind farm study area. It is accessed via the Mt Rouse Tourist Road off Penshurst-Warrnambool Road approximately 2km south of Penshurst township. The closest WTG (T6) is approximately 22.6km south-east.

Figure 9.6 shows the view looking south-east towards the Project from the entry road to Mt Rouse.

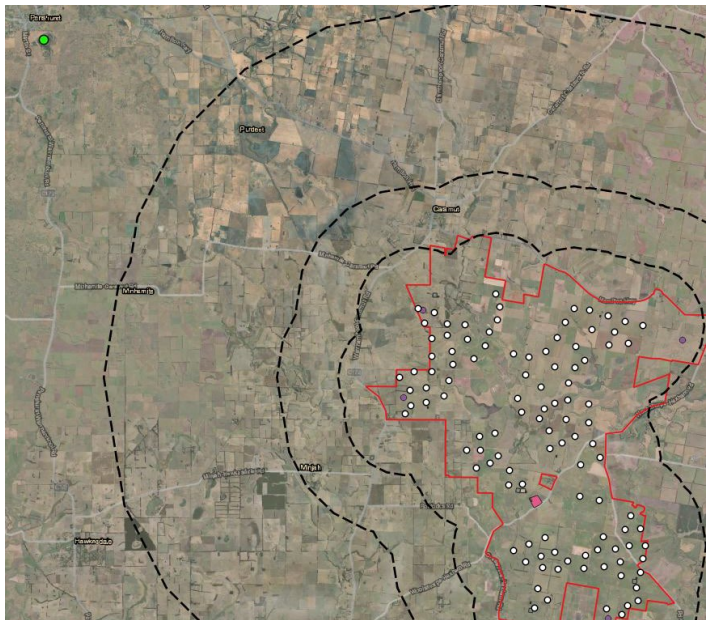


Figure 9.6: Viewpoint V2 – Existing view looking south-east from the entry road

Figure 9.7 below shows the view looking south-east from Mt Rouse Summit.

Figure 9.7: Viewpoint V2 – Existing view looking south-east from the summit

While Mount Rouse is within the "Landscape Unit 3 – Volcanic Cones" the views from the crater walk are to the farmland. The dominant landscape unit within this view is the "Landscape Unit 2a Farmland - the Plains" and stony rises associated with "Landscape Unit 2b Farmland - the stony rises" towards the base of Mt Rouse.

Figure 9.8 below shows the view looking south-east when exiting Mt Rouse.

Figure 9.8: Viewpoint V2 – Existing view looking south-east when exiting Mt Rouse

The proposed WTGs would be visually recognisable under good lighting conditions. At this distance, the WTGs would be in a small portion of this panoramic view and would not be dominant. The views to the surrounding plains and other landscape features would remain even with the addition of the WTGs.

Therefore, the overall visual impact is assessed as **Negligible.**

VIEWPOINT V2 – Mount Rouse (54H 614358, 5806419)			
Distance	**Nearest Project WTG:** 22.6km SE (T6) **Macarthur Windfarm:** 14.7km SW	**ZVI**	**Potentially noticeable, but will not dominate the landscape**
Landscape Unit	Unit 3 – Volcanic Landscapes	**Sensitivity**	High
Viewer Type	Tourist Lookout	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE**		

9.2.3 Viewpoint V3 – Mount Noorat

Viewpoint V3 is located on Mount Noorat approximately 6km north of the township of Terang. Mt Noorat is a dormant scoria cone rising abruptly from the surrounding volcanic plains. Unique to Mt Noorat is the 150m-deep crater, which is lower than the level of the surrounding plain. This is the deepest scoria enclosed crater in Victoria.

The closest WTG (T103) is approximately 26.8km north-west.

Figure 9.9 shows the view looking north-west from the lookout at the edge of the crater at Mt Noorat and in the direction of the Project.

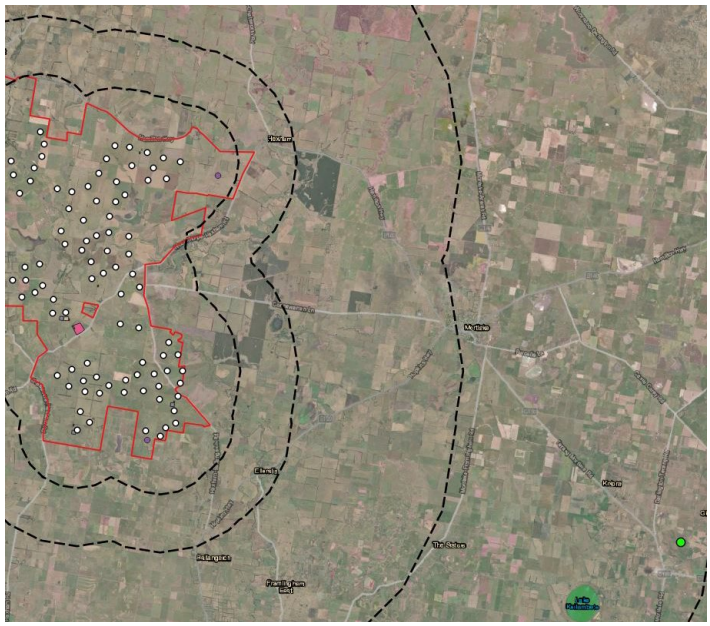


Figure 9.9: Viewpoint V3 – Existing view looking north-west from the lookout at the edge of the crater of Mt Noorat.

Existing topography and vegetation screen views towards the proposed WTGs from the lookout. Figure 9.10 below shows the view looking south through north from the trig point at the top of Mt Noorat.

Figure 9.10: Viewpoint V3 – Existing view looking south through north from the trig point at the top of Mt Noorat.

The view includes the telecommunications facilities on the southern end of Mt Noorat, transmission towers connecting through to Terang Terminal Station with Mt Rouse and Mt Shadwell to the north-west and the Grampians in the distance. Although visible, these features are at such a distance that, while noticeable, they are not dominant features in views.

Figure 9.11 shows an enlargement of the view looking west through north-west towards the Project from the top of Mt Noorat. The communications towers at Mt Noorat can be seen in the left of the image.

Figure 9.11: Viewpoint V3 – Enlargement of the view looking west through north-west from the trig point at the top of Mt Noorat.

The proposed WTGs would be visually recognisable under good lighting conditions. Although, at this distance, the WTGs would be in a small portion of this panoramic view and would not be a dominant element. The views to the surrounding plains and other landscape features would remain even with the addition of the WTGs.

Therefore, the overall visual impact is assessed as **Negligible.**

VIEWPOINT V3 – Mount Noorat (54H 669619, 5772737)			
Distance	**Nearest Project WTG:** 26.8km NW (T103)	**ZVI**	**Potentially noticeable, but will not dominate the landscape**
Landscape Unit	Unit 3 – Volcanic Landscapes	**Sensitivity**	High
Viewer Type	Tourist Lookout	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE**		

9.2.4 Summary of Significant Landscape- Volcanic Cones Viewpoints

It is a requirement of the Victorian Wind Farm Guidelines set out in 52.32 Wind Energy Facility to consider the potential for impacts on views and amenity from significant conservation and recreation areas, water features, tourist routes, and walking tracks. There are no National Parks, State Forests or Scenic Routes located within the study area.

Several significant landscapes or vantage points exist within the Project study area, which are predominantly volcanic structures. Elevated viewing locations such as the volcanic cones, including Tower Hill, Mount Rouse and Mount Noorat are valued landscapes in part due to their expansive vistas afforded across the relatively flat volcanic plains.

Significant landscapes and features are situated towards the outer extent of the study area where turbine prominence and visibility is limited. For these reasons the significant landscapes – Volcanic cones are assessed as **Negligible-Nil**.

9.3 Townships

Seven viewpoint locations (T1-T7) have been selected as representative of the visual impact on viewers in townships within the study area.

Landscape sensitivity is assessed as moderate/high due to the residential component of townships, while the viewer numbers range from low to high depending on the township.

Each viewpoint location is shown in Figure 9.12 and the corresponding GPS co-ordinates and distances to the nearest WTG are listed below in Table 9.2.

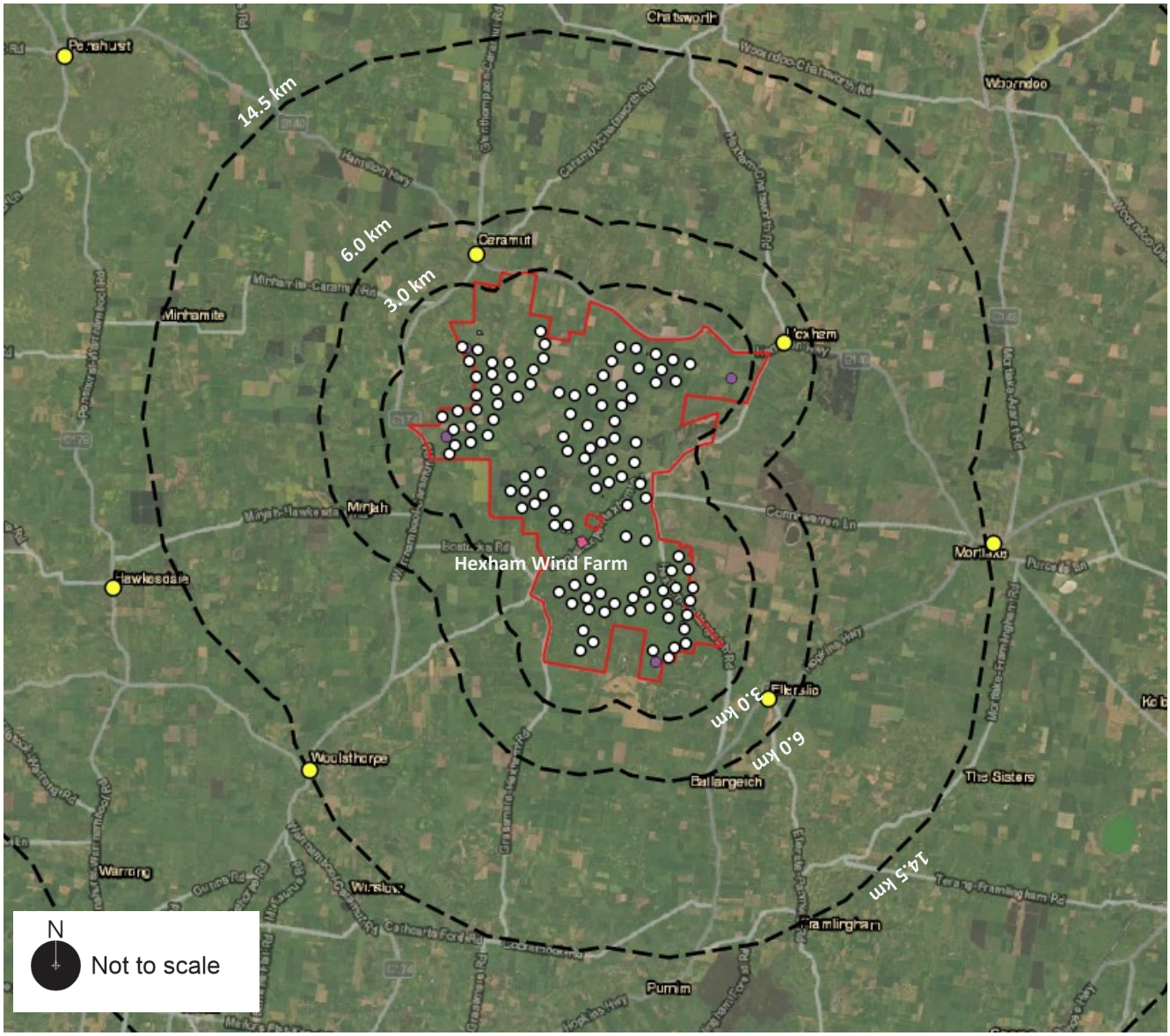


Figure 9.12: Township Viewpoint Locations

Table 9.2: Township Viewpoint Locations

VP	Location	GPS Co-ordinates	Distance and Direction to nearest WTG	Landscape Character Unit
T1	Hawkesdale Township	54H 615909, 5781595	17.5km NE (T2)	Unit 1
T2	Penshurst Township	54H 613538, 5807242	23.8km SE (T6)	Unit 1
T3	Caramut Township	54H 633455, 5797662	4.5km S (T6)	Unit 1
T4	Hexham Township	54H 648312, 5793397	4.6km SW (T107)	Unit 1
T5	Mortlake Township	54H 658377, 5783670	14.6km SW (T108)	Unit 1
T6	Ellerslie Township	54H 647535, 5776176	4.8km NW (T103)	Unit 1
T7	Woolsthorpe Township	54H 625397, 5772779	14.2km NE (T49)	Unit 1

9.3.1 Viewpoint T1 – Hawkesdale Township

Viewpoint T1 is located on Penshurst-Warrnambool Road in Hawkesdale township. The closest WTG (T2) is approximately 17.5km north-east.

Figure 9.13 shows the view looking north towards the Project.

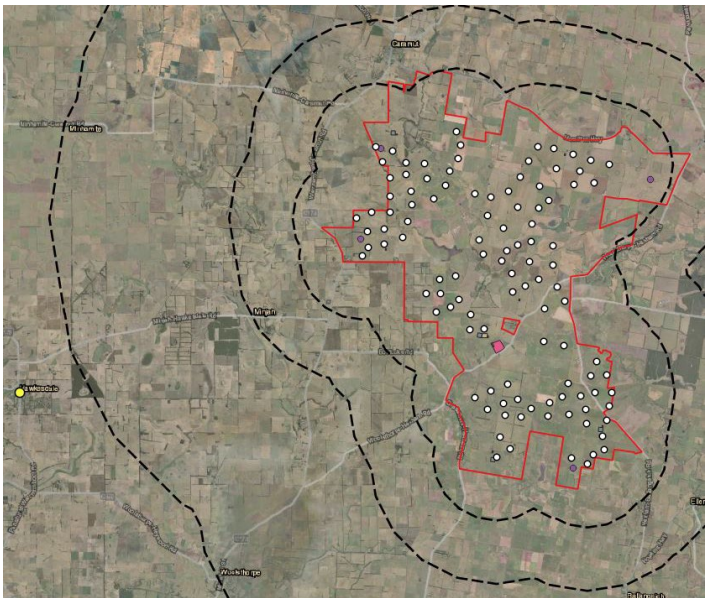


Figure 9.13: Viewpoint T1 – Existing view looking north

The proposed WTGs may be visible from the periphery of the township, where breaks in vegetation and buildings allow for views through to the Project. However, given the distance, intervening vegetation and minor topographical variations they would not be a dominant element in the view. The proposed WTGs would be screened by existing vegetation, buildings and other rural structures within the township.

For these reasons the visual impact is assessed as **Negligible-Nil.**

VIEWPOINT T1 – Hawkesdale Township (54H 615909, 5781595)			
Distance	**Nearest Project WTG:** 17.5km NE (T2)	**ZVI**	**Potentially noticeable, but will not dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE-NIL**		

9.3.2 Viewpoint T2 – Penshurst Township

Viewpoint T2 is located on Hamilton Highway in the Penshurst township. The closest WTG (T6) is approximately 23.8km south-east.

Figure 9.14 shows a view of the main street in Penshurst township.

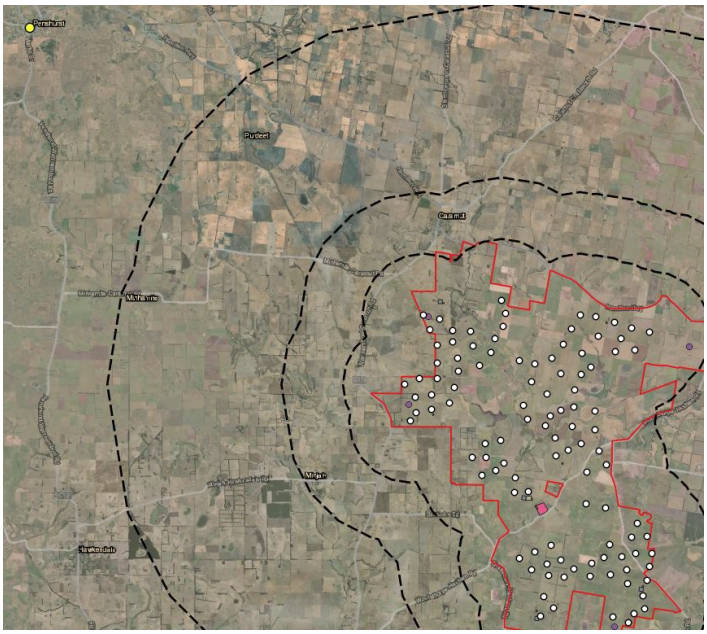


Figure 9.14: Viewpoint T2 – Penshurst township

Views to the surrounding landscape from within the township and most areas within Penshurst are screened by existing buildings and vegetation along roadsides and within private properties.

Therefore, given the distance and intervening vegetation the overall visual impact is assessed as **Negligible-Nil**.

VIEWPOINT T2 – Penshurst Township (54H 613538, 5807242)			
Distance	**Nearest Project WTG:** 23.8km SE (T6)	**ZVI**	**Potentially noticeable, but will not dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE-NIL**		

9.3.3 Viewpoint T3 – Caramut Township

Viewpoint T3 is located on Hamilton Highway in Caramut township. The closest WTG (T6) is approximately 4.5km south.

Figure 9.15 shows the view looking south towards the Project.

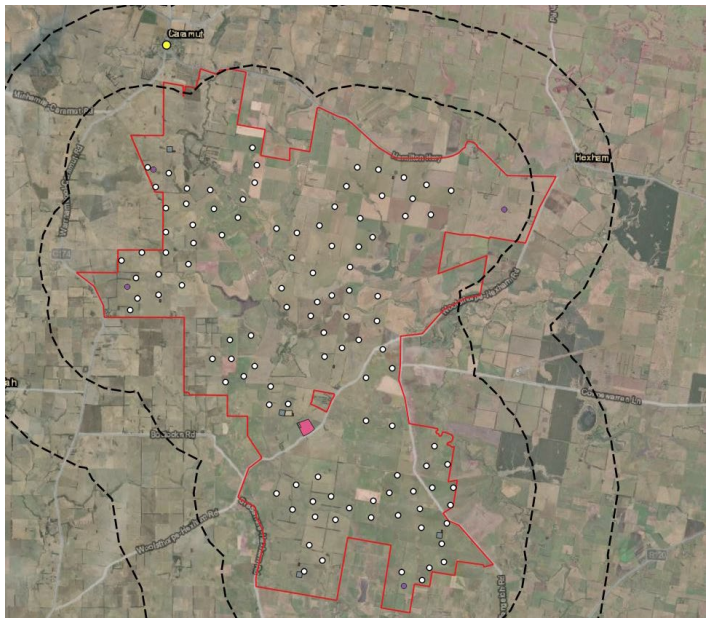


Figure 9.15: Viewpoint T3– Existing view looking south

Vegetation within the road reserves and residential lots would filter or screen views to the proposed wind farm from the main street of Caramut Township.

Views would be available on the southern outskirts of the township (Refer Viewpoint M2).

For these reasons the visual impact is assessed as **Negligible-Nil** for views within the township.

VIEWPOINT T3 – Caramut Township (54H 633455, 5797662)			
Distance	**Nearest Project WTG:** 4.5km S (T6)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE-NIL**		

9.3.4 Viewpoint T4 – Hexham Township

Viewpoint T4 is located on Hexham-Chatsworth Road in Hexham township. The closest WTG (T107) is approximately 4.6km south-west.

Figure 9.16 shows the view looking south-west towards the wind farm.

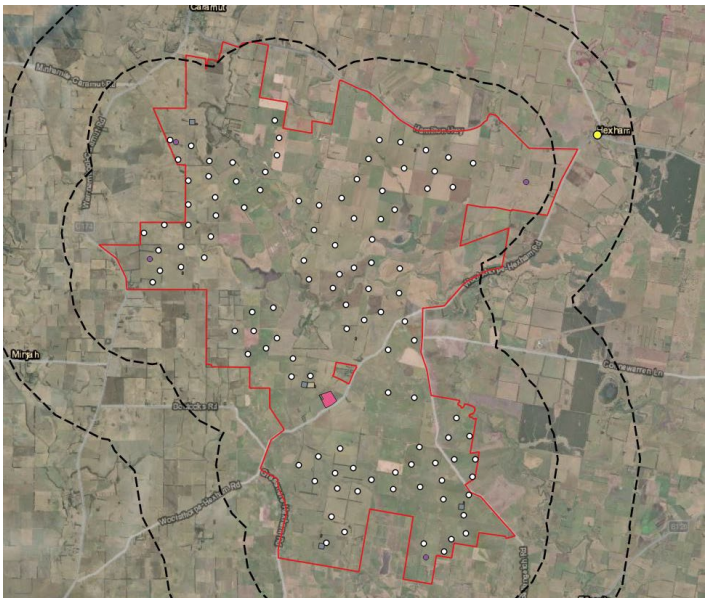


Figure 9.16: Viewpoint T4 – Existing view looking south-west

Existing vegetation within the township, located within road reserves and within residential allotments would filter or screen views to the proposed wind farm from within the township. Clear views would be available on the edges of the town on Hamilton Highway to the south-west (Refer Viewpoint M4).

For these reasons the visual impact is assessed as **Negligible-Nil** from within the township. The visual impact from the margins of the town would be from residential dwellings within these areas. Impacts on such views would be considered as part of the final landscape and visual impact assessment.

VIEWPOINT T4 – Hexham Township (54H 648312, 5793397)			
Distance	**Nearest Project WTG:** 4.6km SW (T107)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE-NIL**		

9.3.5 Viewpoint T5 – Mortlake Township

Viewpoint T5 is located on Hamilton Highway in Mortlake township. The closest WTG (T108) is approximately 14.6km south-west.

Figure 9.17 shows the view looking west towards the wind farm.

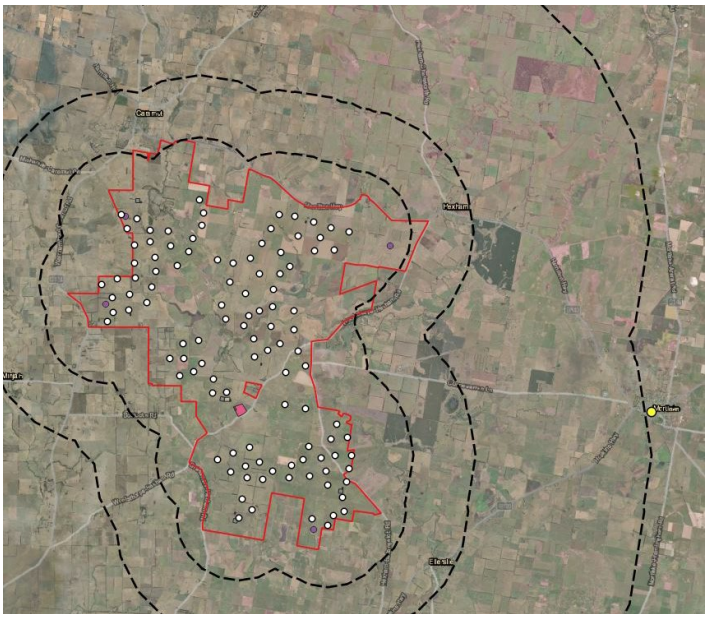


Figure 9.17: Viewpoint T5 – Existing view looking west

Buildings and vegetation within the township would partially screen and filter views to the proposed wind farm limiting views of the proposed turbines from key locations and areas such as the centre of town. Clearer views may be available on the outskirts of Mortlake (Refer Viewpoint L2).

Due partly to the limited visibility of the Project from key areas, and distance to the Project, the visual impact is assessed as **Nil** from within Mortlake township.

VIEWPOINT T5 – Mortlake Township (54H 658377, 5783670)			
Distance	**Nearest Project WTG:** 14.6km SW (T108)	**ZVI**	**Potentially noticeable, but will not dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NIL**		

9.3.6 Viewpoint T6 – Ellerslie Township

Viewpoint T6 is located within Ellerslie Township at the Ellerslie Bridge Truck stop and picnic area on the southern side of the Hopkins Highway.

The closest WTG (T103) is approximately 4.8km NW.

Figure 9.18 shows the view looking north-west towards the Project.

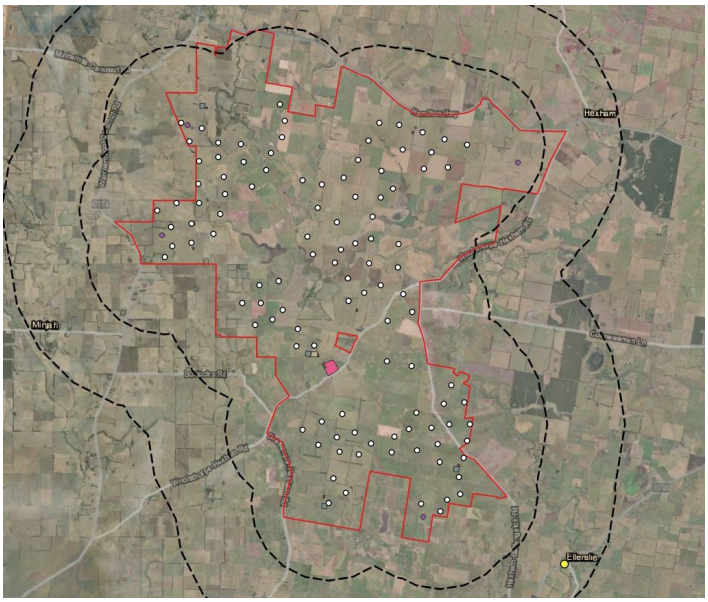


Figure 9.18: Viewpoint T6 – Existing view looking north-west

Existing vegetation within the township, located within road reserves and within residential allotments would filter or screen views to the proposed wind farm from within the township. Clearer views may be available on the outskirts of Ellerslie (Refer Viewpoint M5).

For these reasons the visual impact is assessed as **Negligible** from within Ellerslie township.

VIEWPOINT T6 – Ellerslie Township (54H 647535, 5776176)			
Distance	**Nearest Project WTG:** 4.8km NW (T103)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE**		

9.3.7 Viewpoint T7 – Woolsthorpe Township

Viewpoint T7 is located within the Woolsthorpe Township. The closest WTG (T49) is approximately 14.2km north-east.

Figure 9.19 shows the view looking north-east towards the Project.

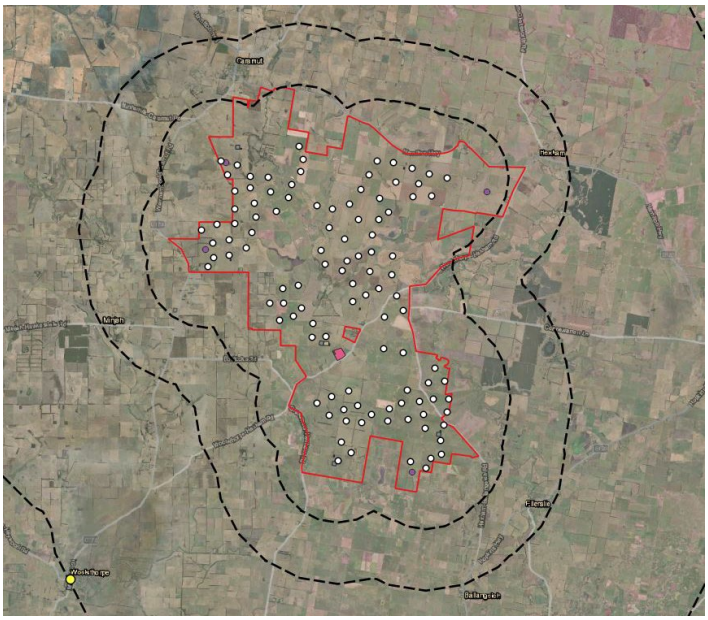


Figure 9.19: Viewpoint T7 – Existing view looking north-east

Views to the surrounding landscape from within the township and most of the residential areas in Woolsthorpe are screened by existing vegetation and buildings.

Therefore, given the distance and intervening vegetation the overall visual impact is assessed as **Negligible-Nil**.

VIEWPOINT T7 – Woolsthorpe Township (54H 625397, 5772779)			
Distance	**Nearest Project WTG:** 14.2km NE (T49)	**ZVI**	**Potentially noticeable and can dominate the landscape**
Landscape Unit	Unit 1 – Rural Communities / Townships	**Sensitivity**	Moderate-High
Viewer Type	Township	**Viewer numbers**	Moderate
OVERALL VISUAL IMPACT	**NEGLIGIBLE-NIL**		

9.3.8 Summary of Township Viewpoints

One of the key considerations of the Victorian Wind Farm Guidelines is the potential for impacts on nearby communities and town centres. This section has reviewed locations and views from several townships and localities within the Project study area. These assessments are supported by the mapping prepared by the SAA in section 9 of this report, and views

observed from within and around the townships. The overall visual impact from these areas is considered to be Negligible-Nil predominantly due to screening and filtering of views through existing vegetation and buildings within the township screening and filtering views to the Project.

9.4 Major Roads

Defined highways and major roads within the study area are limited to the Hamilton Highway to the north of the Project and the Hopkins Highway to the east of the Project. Five viewpoint locations (M1-M5) have been selected as representative of the visual impact on viewers using the major roads within the study area. Viewer numbers would be assessed as medium/moderate while the landscape sensitivity would vary depending on the location of the viewpoint.

Each viewpoint location is shown in Figure 9.20 and the corresponding GPS co-ordinates and distances to the nearest WTG are listed below in Table 9.3.

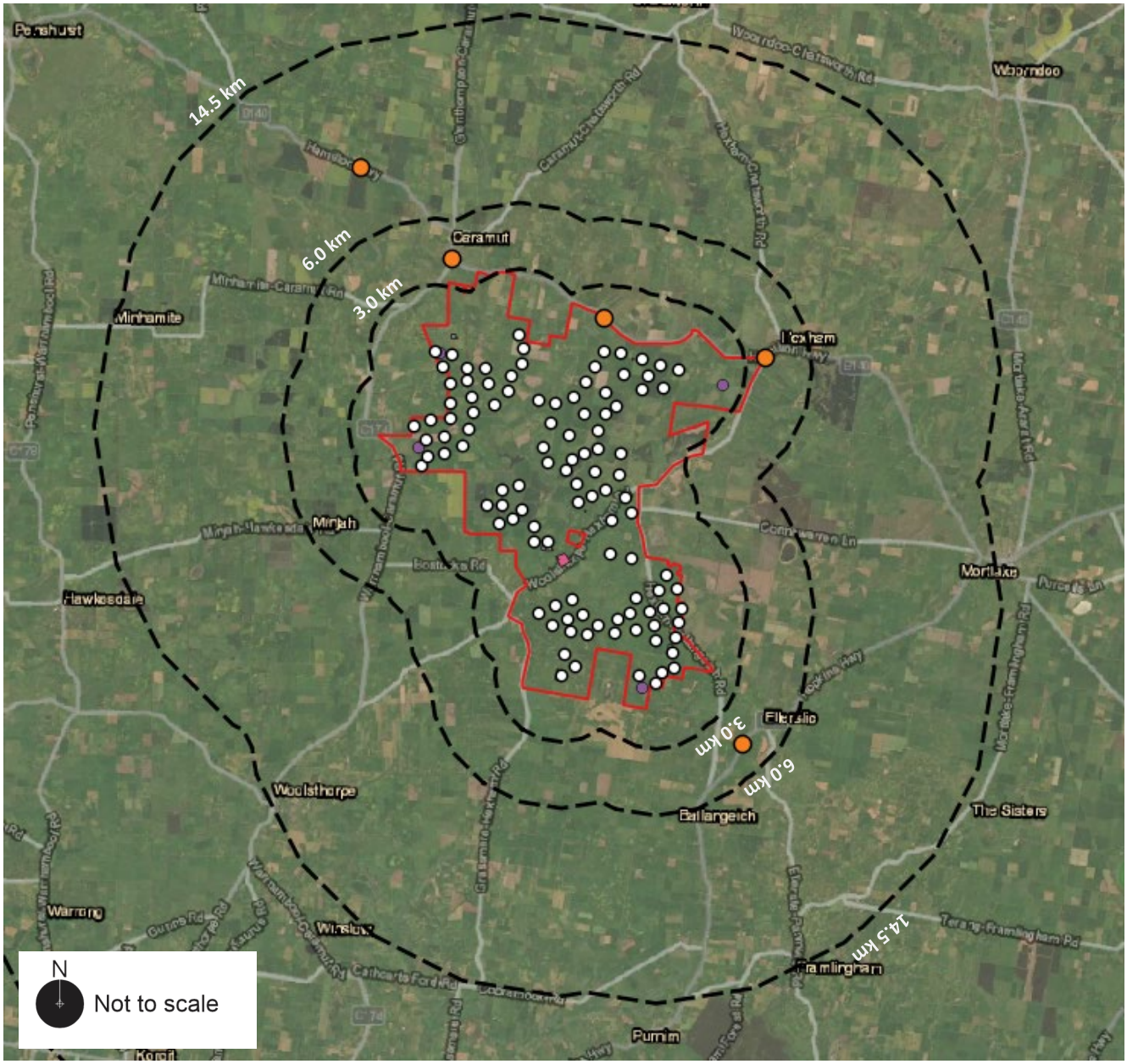


Figure 9.20: Major Roads Viewpoint Locations

These roads provide connections between larger towns, points of interest and tourist locations. Trips along these roads are typically longer in duration and distance than local roads and provide the opportunity to interpret the landscape and features at a regional scale.

Table 9.3: Major Roads Viewpoint Locations

VP	Location	GPS Co-ordinates	Distance and Direction to nearest WTG	Landscape Character Unit
M1	Hamilton Highway #1	54H 629374, 5801519	8.9km SE (T6)	Unit 2a
M2	Hamilton Highway #2	54H 633497, 5797389	4.2km S (T6)	Unit 2a
M3	Hamilton Highway #3	54H 640398, 5794676	1.4km S (T70)	Unit 2a
M4	Hamilton Highway #4	54H 647663, 5792931	3.9km SW (T107)	Unit 2a
M5	Hopkins Highway	54H 646645, 5775453	4.6km NW (T103)	Unit 2a

9.4.1 Viewpoint M1 – Hamilton Highway #1

Viewpoint M1 is located on Hamilton Highway. The closest WTG (T6) is approximately 8.9km south-east.

Figure 9.21 shows the view looking south-east towards the Project.

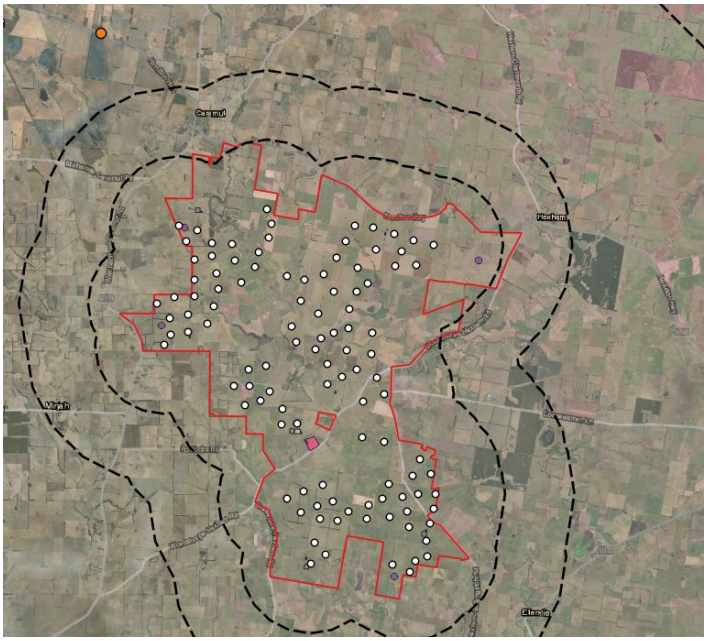


Figure 9.21: Viewpoint M1 – Existing view looking south-east

Vegetation seen in Figure 9.21 would filter views to the proposed WTGs. Where visible, at a distance of approximate 8.9km, when travelling at approximately 100km/hr along the Hamilton Highway. Dur to distance and intervening vegetation, turbines of this scale have the potential to be noticeable but would not be a dominant element in the view.

For these reasons the visual impact is assessed as **Low - Negligible**.

VIEWPOINT M1 – Hamilton Highway #1 (54H 629374, 5801519)			
Distance	**Nearest Project WTG:** 8.9km SE (T6)	**ZVI**	**Potentially noticeable and can dominate the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Highway	**Viewer numbers**	Moderate-High
OVERALL VISUAL IMPACT	**LOW - NEGLIGIBLE**		

9.4.2 Viewpoint M2 – Hamilton Highway #2

Viewpoint M2 is located on Hamilton Highway. The closest WTG (T6) is approximately 4.2km south.

Figure 9.22 shows the view looking south-east towards the Project.

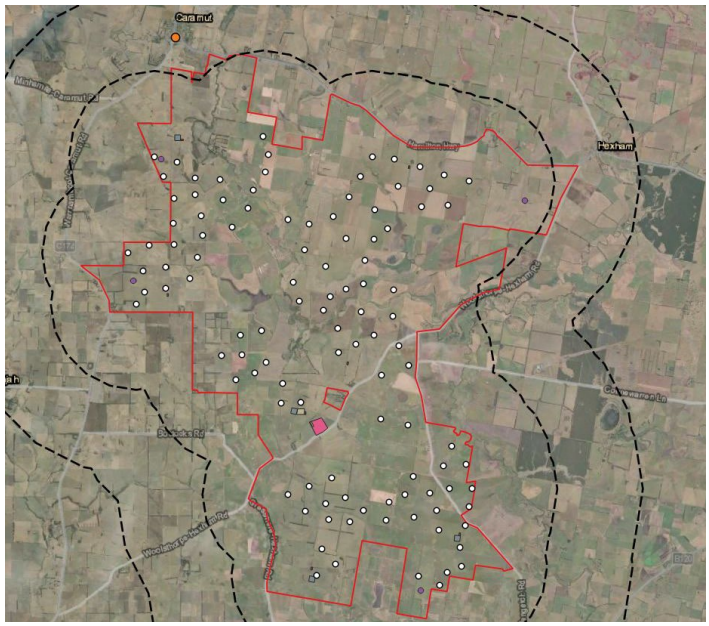


Figure 9.22: Viewpoint M2 – Existing view looking south-east

Vegetation located within the roadside and along the fence lines of properties would filter views towards parts of the Project. At a distance of approximately 4.2km, the WTGs would be a noticeable element in views for people travelling east along the Hamilton Highway from Caramut township. Due to the prominence of turbines, low sensitivity of the landscape in views towards the WTGs and viewer numbers, the visual impact is assessed as **Low**.

VIEWPOINT M2 – Hamilton Highway #2 (54H 633497, 5797389)			
Distance	**Nearest Project WTG:** 4.2km S (T6)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Highway	**Viewer numbers**	Moderate-High
OVERALL VISUAL IMPACT	**LOW**		

9.4.3 Viewpoint M3 – Hamilton Highway #3

Viewpoint M3 is located on Hamilton Highway. The closest WTG (T70) is approximately 1.4km south.

Figure 9.23 shows the context of the view looking south towards the Project.

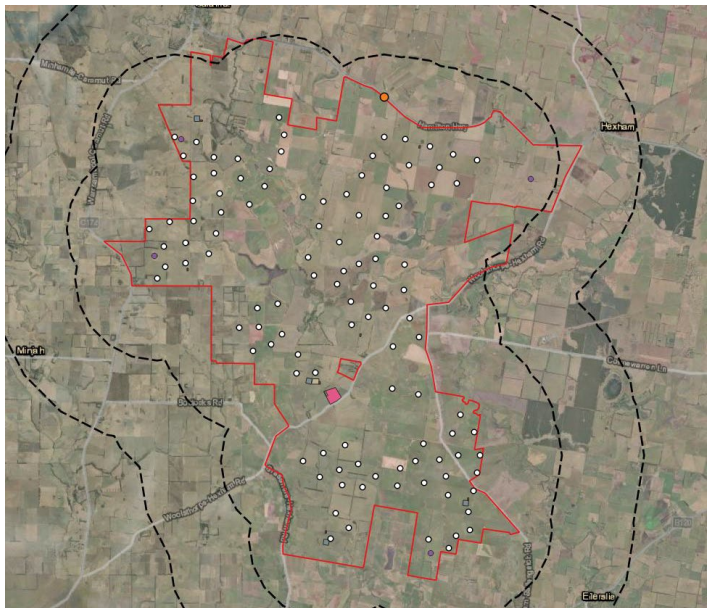


Figure 9.23: Viewpoint M3– Existing view looking south

Viewpoint M3 is taken from the northern edge of the Project boundary. This viewpoint is taken from a stretch of the Hamilton Highway with limited roadside vegetation.

At a distance of approximately 1.4km the WTGs have the ability to dominate the view. However, these WTGs would be perpendicular to the view, the road speed along this edge is 100km/hr, therefore views would be generally short in duration. Views towards the Project are over Landscape Unit 2a which has a low sensitivity to visual change. There are also limited to no recognised features of significance that would also include the proposed turbines.

For these reasons the visual impact is assessed as **Low-Moderate**.

VIEWPOINT M3 – Hamilton Highway #3 (54H 640398, 5794676)			
Distance	**Nearest Project WTG:** 1.4km S (T70)	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Highway	**Viewer numbers**	Moderate-High
OVERALL VISUAL IMPACT	**LOW-MODERATE**		

9.4.4 Viewpoint M4 – Hamilton Highway #4

Viewpoint M4 is located on Hamilton Highway. The closest WTG (T107) is approximately 3.9km south-west.

Figure 9.24 shows the view looking south-west towards the Project.

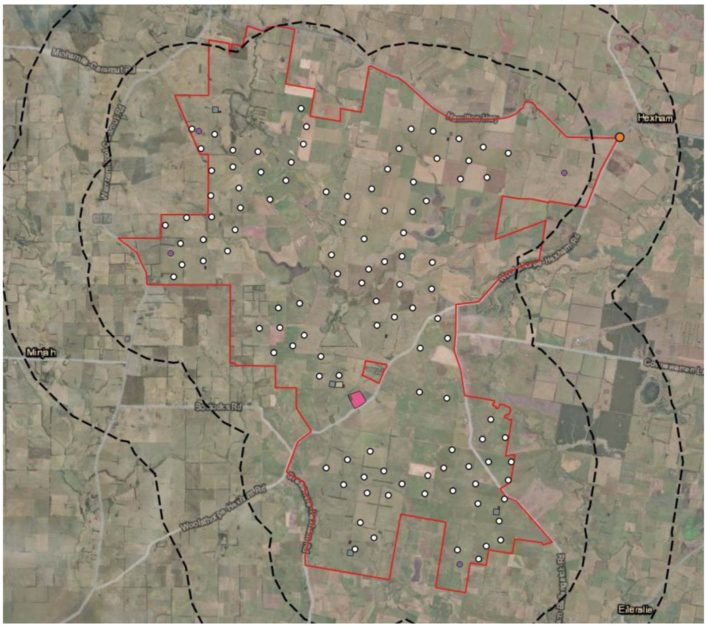


Figure 9.24: Viewpoint M4 – Existing view looking south-west

Viewpoint M4 is taken from the north-eastern corner of the Project boundary. This viewpoint is taken from the service road next to the Hamilton Highway at a gap in roadside vegetation.

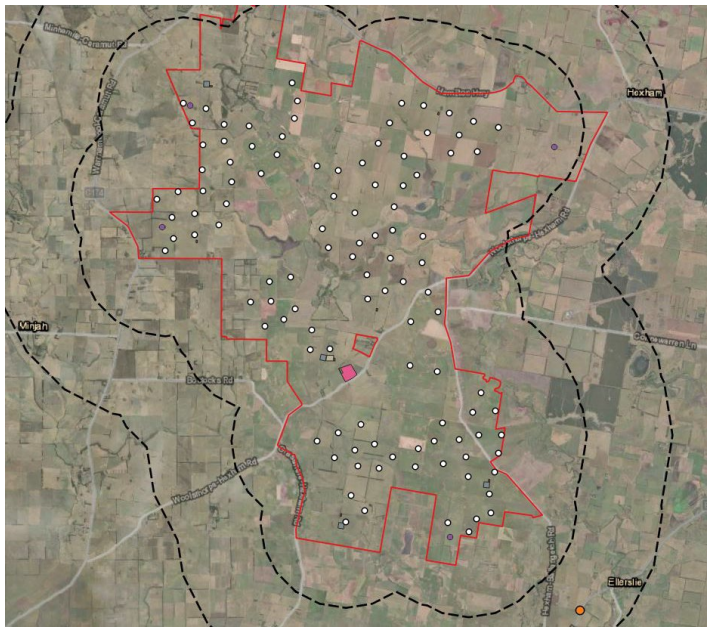
At a distance of approximately 3.9km the WTGs would be visible and have the ability to dominate the view. However, the WTGs would be central to the view for a short stretch of road before the road veers to the right and heads west. The WTGs would be viewed over Landscape Unit 2a which has a low sensitivity to visual change. For these reasons the visual impact is assessed as **Low**.

VIEWPOINT M4 – Hamilton Highway #4 (54H 647663, 5792931)			
Distance	**Nearest Project WTG:** 3.9km SW (T107)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Highway	**Viewer numbers**	Moderate-High
OVERALL VISUAL IMPACT	**LOW**		

9.4.5 Viewpoint M5 – Hopkins Highway

Viewpoint M5 is located on Hopkins Highway at the intersection with Red Lane. The closest WTG (T103) is approximately 4.6km north-west.

Figure 9.25 shows the view looking north-west towards the Project.



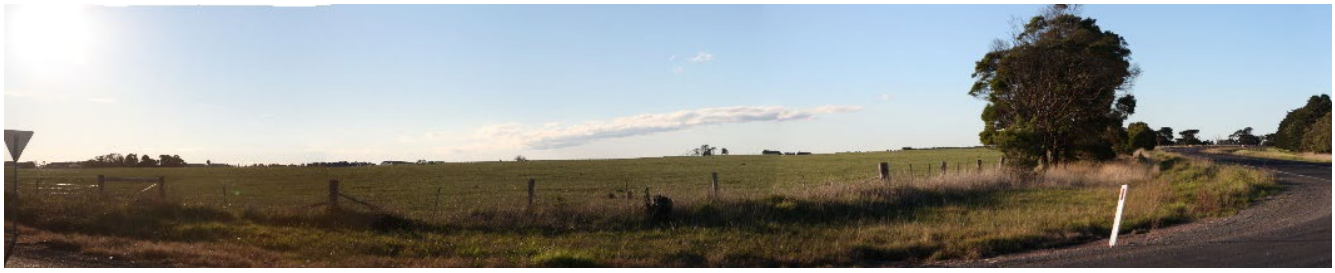


Figure 9.25: Viewpoint M5 – Existing view looking north-west

Viewpoint M5 is taken at the intersection of Red Lane that allows for views towards the wind farm through a break in roadside vegetation.

At a distance of approximately 4.3km, the proposed WTGs have the potential to be a noticeable element in the view, however when viewed perpendicular to the view at approximately 100km/hr would not dominate the view. These WTGs would also be viewed over Landscape Unit 2a which has a low sensitivity to visual change.

For these reasons the visual impact is assessed as **Low**.

VIEWPOINT M5 – Hopkins Highway (54H 646645, 5775453)			
Distance	**Nearest Project WTG:** 4.6km NW (T103)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Highway	**Viewer numbers**	Moderate-High
OVERALL VISUAL IMPACT	**LOW**		

9.4.6 Summary of Major Roads Viewpoints

This section has considered the visual impact of the Project from several viewing locations located along major roads within the Project study area. The selected locations demonstrate the range of views and viewing angles distances and key approaches towards the Project within the region.

Overall, the visual impact of the Project in views from major roads would be assessed as **Low-Moderate** through to **Low-Negligible**. This is due to the majority of views towards the Project being across Landscape Unit 2a which has a low sensitivity to visual change.

9.5 Local Roads

Five viewpoint locations (L1-L5) have been selected as representative of the visual impact on viewers using the local roads within the study area. Viewer numbers would be assessed as low while the landscape sensitivity would vary dependant on the location of the viewpoint.

Each viewpoint location is shown in Figure 9.26 and the corresponding GPS co-ordinates and distances to the nearest WTG are listed below in Table 9.4.

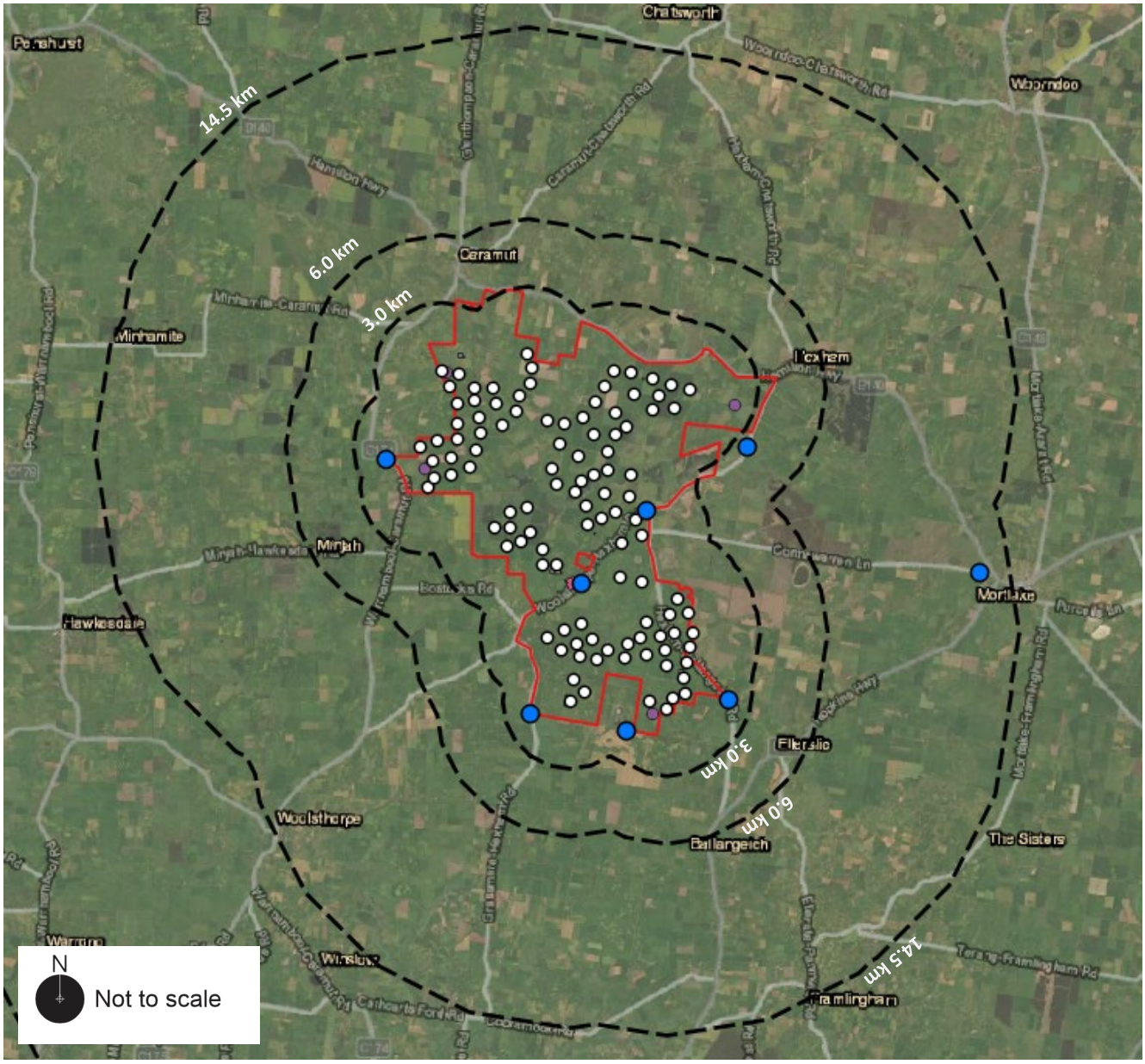


Figure 9.26: Local Roads Viewpoint Locations

Table 9.4: Local Roads Viewpoint Locations

VP	Location	GPS Co-ordinates	Distance and Direction to nearest WTG	Landscape Character Unit
L1	Woolsthorpe-Hexham Road	54H 646280, 5789826	3.5km NW (T107)	Unit 2a
L2	Connewarren Lane	54H 656624, 5784245	13.0km SW (T108)	Unit 2a
L3	Woolsthorpe-Hexham Road #1	54H 641854, 5786992	670m SW (T82)	Unit 2a
L4	Woolsthorpe-Hexham Road #2	54H 638966, 5783779	1.3km NW (T42)	Unit 2a
L5	Hexham-Ballangeich Road	54H 645497, 5778610	2.0km W (T103)	Unit 2a
L6	Gordans Lane	54H 640915, 5777259	1.6km NE (T89)	Unit 2a
L7	Grassmere-Hexham Road	54H 636679, 5777978	1.8km NE (T49)	Unit 2a
L8	Warrnambool-Caramut Road	54H 630296, 5789247	1.6km NE (T1)	Unit 2a

9.5.1 Viewpoint L1 – Woolsthorpe-Hexham Road

Viewpoint L1 is located on Woolsthorpe-Hexham Road. The closest WTG (T107) is approximately 3.5km north-west.

Figure 9.27 shows the view looking west towards the Project.

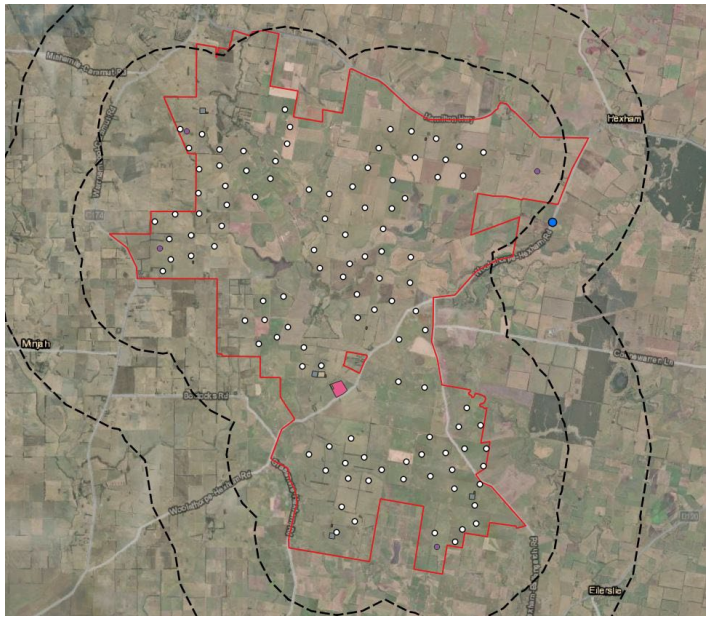


Figure 9.27: Viewpoint L1 – Existing view looking west

At a distance of approximately 3.5km the proposed WTGs have the potential to be a dominant element in the view. This view is taken from a local road with few users and is a view over Landscape Unit 2a which has a low sensitivity for visual change.

For these reasons the visual impact is assessed as **Low**.

VIEWPOINT L1 – Woolsthorpe-Hexham Road (54H 646280, 5789826)			
Distance	**Nearest Project WTG:** 3.5km NW (T107)	**ZVI**	**Highly visible and will usually dominate the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**LOW**		

9.5.2 Viewpoint L2 – Connewarren Lane

Viewpoint L2 is located on Connewarren Lane. The closest WTG (T108) is approximately 13.0km south-west.

Figure 9.28 shows the view looking west towards the Project.

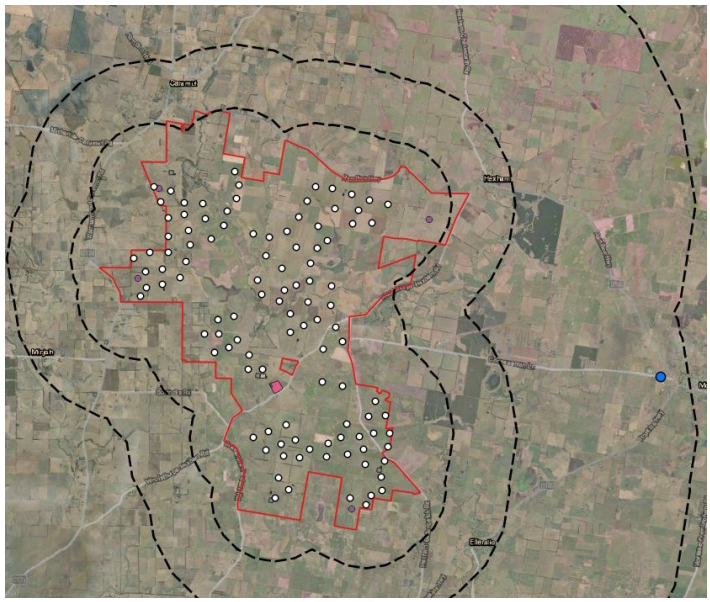


Figure 9.28: Viewpoint L2 – Existing view looking west

Viewpoint L2 is taken from Connewarren Lane on the outskirts of Mortlake. When travelling west towards Mortlake Terminal Station the proposed WTGs may be visible.

At a distance of approximately 13km the proposed WTGs may be visible but would not be a dominant element in the view.

For these reasons the visual impact is assessed as **Low**.

VIEWPOINT L2 – Connewarren Lane (54H 656624, 5784245)			
Distance	**Nearest Project WTG:** 13.0km SW (T108)	**ZVI**	**Potentially noticeable and can dominate the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**Low**		

9.5.3 Viewpoint L3 – Woolsthorpe-Hexham Road #1

Viewpoint L3 is located on Woolsthorpe-Hexham Road near the intersection with Hexham-Ballangeich Road.

The closest WTG (T82) is approximately 670m south-west.

Figure 9.29 shows the view looking southwest to north west through west.

The 550 kV transmission line within the Projects southern is to the south of this location.

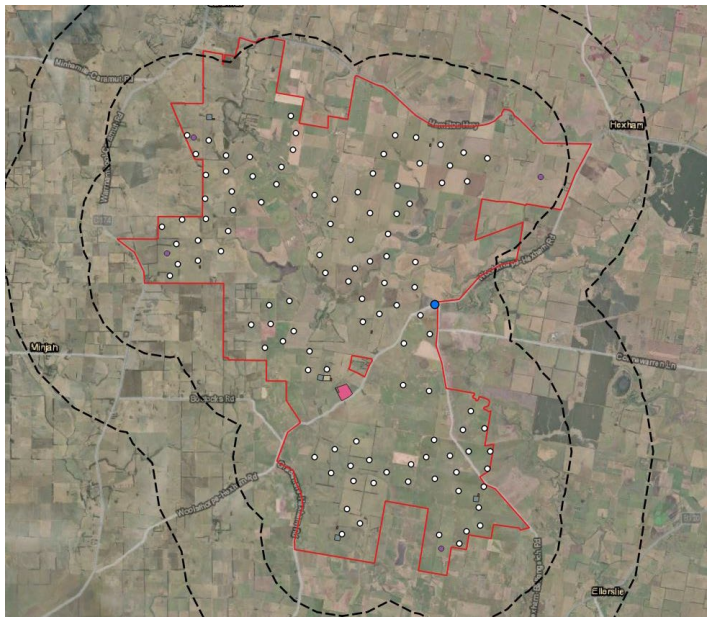


Figure 9.29: Viewpoint L3 – Existing view looking south through north

This view is taken from a stretch of road with limited roadside vegetation to filter views. Woolsthorpe-Hexham Road runs through the centre of the Project and at a distance of approximately 670m the proposed WTGs would be a dominant element in the view. The location of the proposed on-site substation would be along the northern side of the Woolsthorpe-Hexham Road. In this view, the substation would be to the right of the road and in the background.

This view is taken from a local with few users and is a view over Landscape Unit 2a which has a low sensitivity to visual change.

For these reasons, the visual impact is assessed as **Low-Moderate**.

VIEWPOINT L3 – Woolsthorpe-Hexham Road #1 (54H 641854, 5786992)			
Distance	**Nearest Project WTG: 670m SW (T82)**	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**LOW-MODERATE**		

9.5.4 Viewpoint L4 – Woolsthorpe-Hexham Road #2

Viewpoint L4 is located on Woolsthorpe-Hexham Road central to the Project. The closest WTG (T42) is approximately 1.3km north-west.

The proposed on-site terminal station is located approximately 150m south-west.

Figure 9.31 shows the view looking south-west through to north-east.

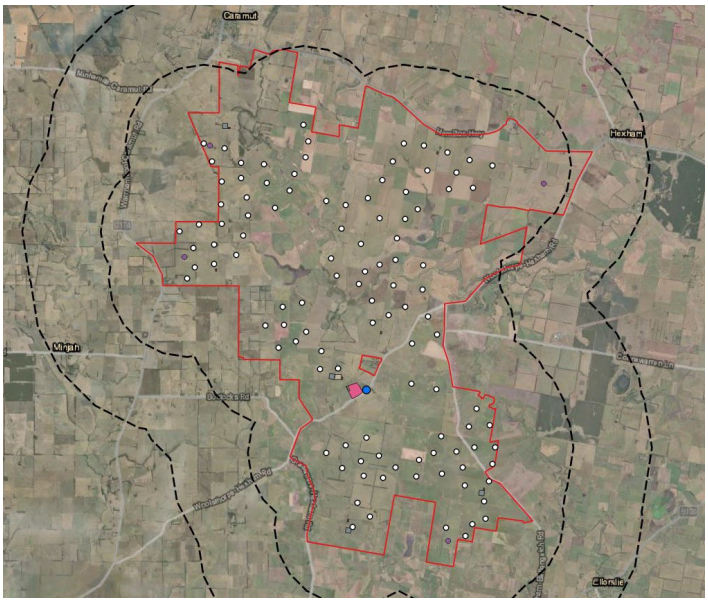


Figure 9.30: Viewpoint L4 – Existing view looking south-west through to north-east

Woolsthorpe-Hexham Road runs through the centre of the Project and at a distance of approximately 1.3km the proposed WTGs have the potential to be a dominant element in the view. The proposed terminal station would be located approximately 150m south-west in front of the existing 500kV transmission line seen in the view.

This view is taken from a stretch of road with limited roadside vegetation to filter views. This view is taken from a local with few users and is a view over Landscape Unit 2a which has a low sensitivity to visual change.

Due to reasons set out above, and the low viewer numbers, the visual impact is assessed as **Low-Moderate**.

VIEWPOINT L4 – Woolsthorpe-Hexham Road #2 (54H 638966, 5783779)			
Distance	**Nearest Project WTG:** 1.3km NW (T42) **On-site Terminal Station:** 150m SE	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low

OVERALL VISUAL IMPACT	**LOW-MODERATE**

9.5.5 Viewpoint L5 – Hexham-Ballangeich Road

Viewpoint L5 is located on Hexham-Ballangeich Road. The closest WTG (T103) is approximately 2.0km north-west.

Figure 9.32 shows the view looking north-west towards the Project.

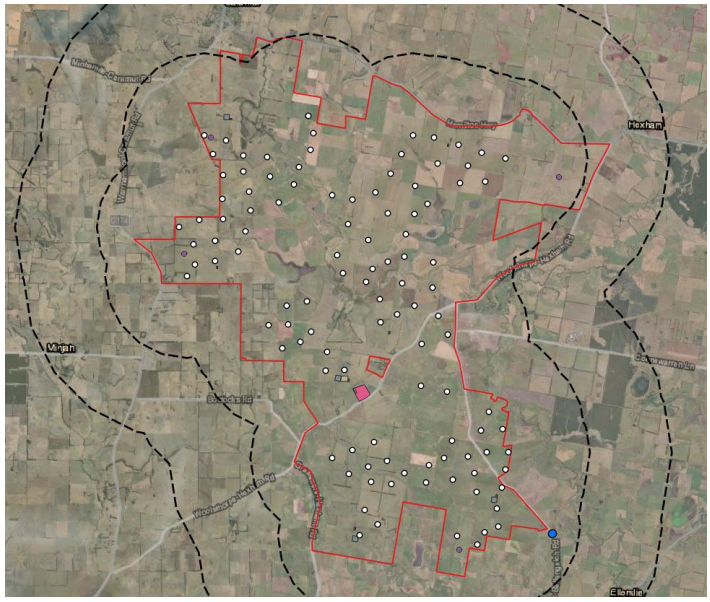


Figure 9.31: Viewpoint L5 – Existing view looking north-west

At a distance of approximately 2.0km the proposed WTGs have the potential to be a dominant element in the view. This view is taken from a local road with few users and is a view over Landscape Unit 2a which has a low sensitivity for visual change.

Existing vegetation in the reserve and along property lines, would assist to filter views to some WTGs.

For these reasons the visual impact is assessed as **Low**.

VIEWPOINT L5 – Hexham-Ballangeich Road (54H 645497, 5778610)			
Distance	**Nearest Project WTG:** 2.0km W (T103)	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**LOW**		

9.5.6 Viewpoint L6 - Gordan's Lane

Viewpoint L6 is located on Gordan's Lane. The closest WTG (T89) is approximately 1.6km north-east.

Figure 9.33 below shows the view looking north towards the Project.

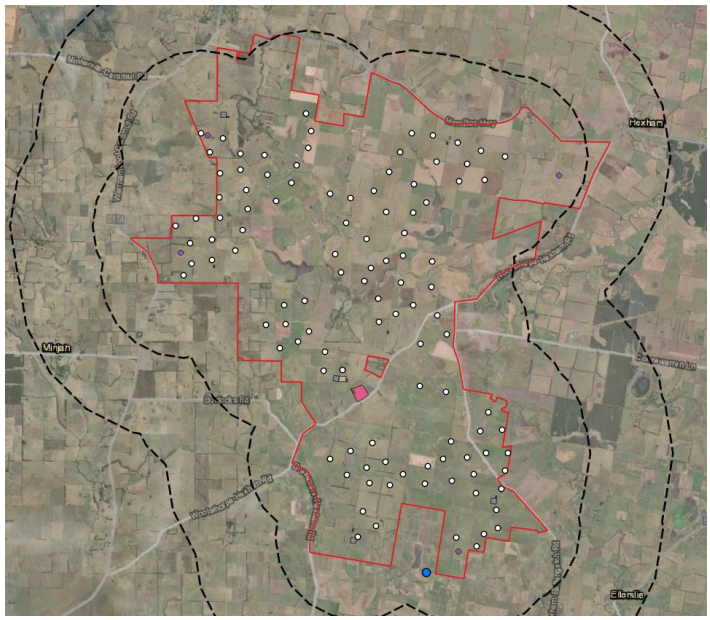


Figure 9.32: Viewpoint L6 – Existing view looking north

At a distance of approximately 1.4km the proposed WTGs have the potential to be a dominant element in the view. This view is taken from a local road with few users and is a view over Landscape Unit 2a which has a low sensitivity for visual change.

For these reasons the visual impact is assessed as **Low**.

VIEWPOINT L6 – Gordons Lane (54H 640915, 5777259)			
Distance	**Nearest Project WTG:** 1.6km NE (T89)	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**LOW**		

9.5.7 Viewpoint L7 – Grassmere-Hexham Road

Viewpoint L7 is located on Grassmere-Hexham Road. The closest WTG (T49) is approximately 1.8km north-east.

Figure 9.34 below shows the view looking north-east towards the Project.

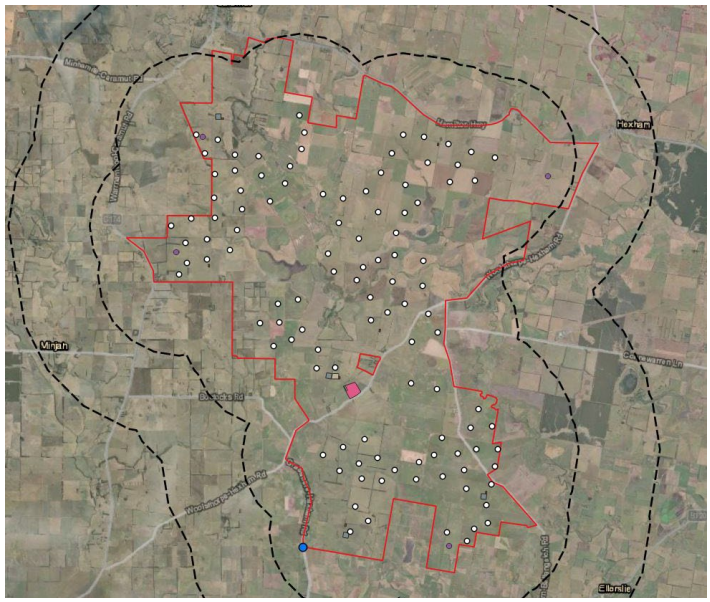


Figure 9.33: Viewpoint L7 – Existing view looking north-east towards the Project.

At a distance of approximately 1.8km the proposed WTGs have the potential to be a dominant element in the view. This view is taken from a local road with few users and is a view over Landscape Unit 2a which has a low sensitivity for visual change.

Extensive vegetation within the road reserves and property boundaries would filter or screen the views to the Project for a long stretch of this road.

For these reasons the visual impact is assessed as **Negligible**.

VIEWPOINT L7 – Grassmere-Hexham Road (54H 636679, 5777978)			
Distance	**Nearest Project WTG:** 1.8km NE (T49)	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**NEGLIGIBLE**		

9.5.8 Viewpoint L8 – Warrnambool-Caramut Road

Viewpoint L8 is located on Warrnambool-Caramut Road approximately 1.6km north-west of the intersection with Keilors Road.

The nearest WTG (T1) is approximately 1.6km north-east.

Figure 9.35 below shows the view looking north-east to south-east toward the Project.

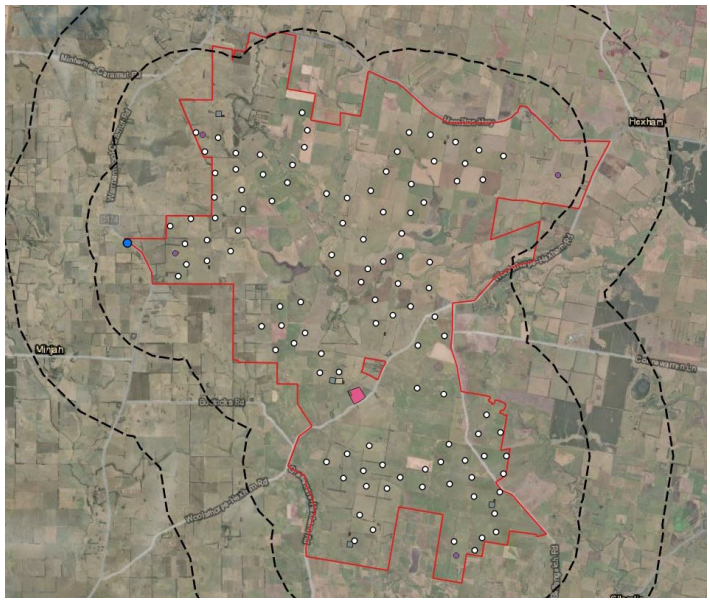


Figure 9.34: Viewpoint L8 – Existing view looking north-east to south-east.

At a distance of approximately 1.6km the proposed WTGs have the potential to be a dominant element in the view. This view is taken from a local road with few users and is a view over Landscape Unit 2a which has a low sensitivity for visual change.

Existing vegetation in the reserve and along property lines, would assist to filter views to some WTGs.

For these reasons the visual impact is assessed as **Low**.

VIEWPOINT L8 – Warrnambool-Caramut Road (54H 630296, 5789247)			
Distance	**Nearest Project WTG:** 1.6km NE (T1)	**ZVI**	**Will always be visually dominant in the landscape**
Landscape Unit	Unit 2a – Plains Farmland	**Sensitivity**	Low
Viewer Type	Local	**Viewer numbers**	Low
OVERALL VISUAL IMPACT	**LOW**		

9.5.9 Summary of Local Road Viewpoints

The assessment of views and visual impacts from local roads reviewed several locations from and range of distances and viewing angles towards the Project. The assessment of these views concluded that overall, the visual impact from local roads would be **Low**. Views from local roads within the wind farm layout have been assessed as low to moderate. The higher assessment of moderate recognises the close proximity of views from these locations to the proposed turbines, in the context of low viewer numbers, low sensitivity of the landscape to visual change and the informal nature of views.

10. Residential dwellings within 6km

The greatest potential for visual impacts to occur is from neighbouring, non-participating residential properties within 6.0 km of a 250 m high turbine. The visual impact is in part one that can be assessed by discussing the number and scale of wind turbines in particular views, although the perceived visual impact is influenced by the individual viewer. For this reason, the assessment of visual impact from residential properties differs from that undertaken from publicly accessible viewpoints.

For residential occupiers, the view to the wind turbines may not be just a glimpse or a 5-minute experience as they drive around the local road network, but potentially a permanent view from living areas or outside entertainment spaces of their homes. Landholders that farm the land may also be impacted as they work on their property. These areas, like other places of work, are not considered as sensitive as views from places of residence or attached private open space.

The analysis of visual impact from residential properties is based on the following assumptions:

- An occupant of a residential dwelling will have a high degree of sensitivity to the change in their immediate landscape.
- Visitor numbers do not apply to residences.
- Farmers may be able to see the wind turbines as they move around their property. These areas may be used as much in daylight hours as the living areas of their residences.
- Landscaping can be designed to mitigate the visual impact when located near a fixed viewpoint, such as a residence, with far greater ease than that can be achieved along the road network.

The SAA in Figure 10-1 shows theoretical turbine visibility based on key project infrastructure and topography of the surrounding landscape and the dwellings within 6km of a WTG.

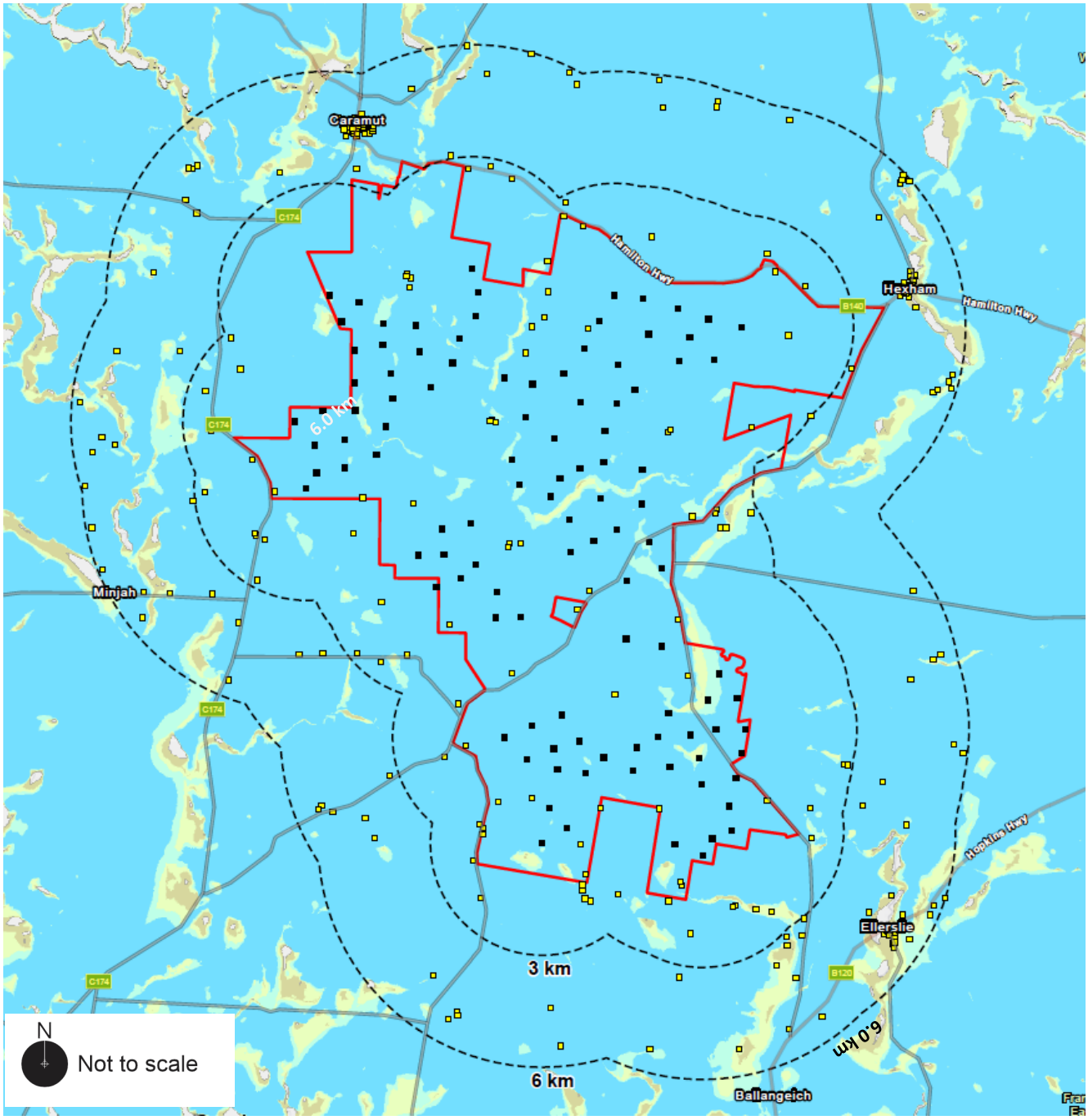


Figure 10-1 Dwellings in proximity to the Project

The SAA shows that the entire area within 6.0 km of a turbine has the potential see either part or all of several turbines. This model is a high-level study only that assists to understand patterns of visibility. This model does not include features such as vegetation, buildings, structures, or micro topographical changes and low rises that can also assist to screen or filter views.

10.1 Mitigation options

All approved wind farm projects within Victoria are required to provide landscape mitigation for residential dwellings within an area where a high level of visual impacts is predicted. This area is based upon the overall height of the proposed turbines and the distance at which an approved turbine has the potential to be a dominant visual feature. For this Project, this distance has been established at up to 6.0 km from the base of a turbine.

Mitigation measures may include:

- vegetation screening to filter or obscure the Project from dwellings or areas of private open space
- re-siting of Project infrastructure from sensitive viewing areas and key view lines
- screen planting around substations, buildings, and lower infrastructure.

The requirement for landscape screening is a condition of the permit, requiring the permit holder to implement measures to reduce the visual impact of turbines on all non-participant dwellings—from within the primary dwelling as well as the attached outdoor areas of private open space.

Areas that are eligible or required to be screened are:

- habitable rooms from within the dwelling
- primary or common dwellings entrances
- artist's studios
- adjoining outdoor private open space.

Many of the more established dwellings in proximity to the Project already include many mature trees planted to protect against winds and weather extremes in the region. This vegetation, while established for other purposes, will assist in screening or filtering views to the Project.

The landscape patterning of the area also includes many planted windbreaks and hedgerows, vegetation within road reserves and property boundaries, areas of managed timber plantations, and conservation areas. This vegetation and its screening properties have been discussed in various viewpoints in section 9 of this report. It is clear from these examples that landscape mitigation is possible for many of the residential dwellings in proximity to the Project.

Landscape mitigation measures should be determined on a case-by-case basis and in consultation with landholders - to minimise adverse impacts. Such a process has occurred in past Projects, after approval of the wind farm, with advice and funding being supplied by the proponent. It must however be recognised that not all landowners may wish to screen views of turbines either through a preference to see the turbines, the potential to remove views, or for other aesthetic reasons.

The following section sets out the considerations and requirements for the screening of views from residential dwellings.

10.1.1 Placement and screening

Figure 10-2 shows an example of existing vegetation and placement of new landscaping to assist with screening views to turbines. This example is based on the owner's desire that the views to wind turbines should be screened or filtered.

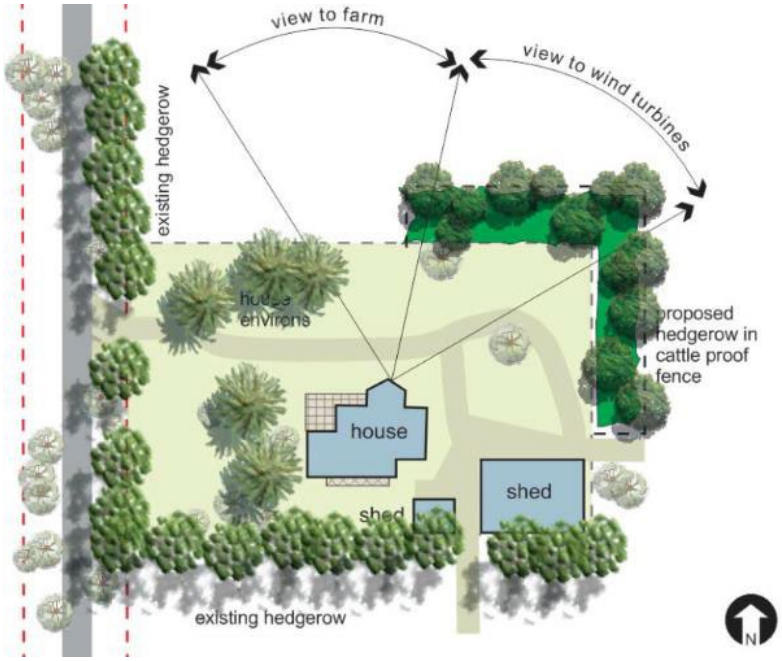


Figure 10-2: Potential Landscape Mitigation Measure

Alternatives may include careful placement of single trees or clusters to screen views to the nearest and most visually noticeable turbine.

10.1.2 Vegetation heights

Vertical view angles consider the overall height of the turbines and the distance of the dwelling to the turbine, and this is relevant to determining the heights that vegetation will be required to achieve screened views. Similar to the discussions on determining the Zones of Visual Influence discussed throughout this report, the view angle or visual scale of turbines will change over distance. The greater the distance between a viewing location and a turbine the smaller the turbine will appear, similarly the closer the viewing location the larger the turbine will appear.

By analysing view angles for a 250 m high turbine, it is possible to determine the approximate height that landscape mitigation would be required to achieve to ameliorate visual impacts from residential dwellings.

To be conservative, the following will describe the view angle at a distance of 1.0 km from a turbine and how this translates to landscape mitigation.

For dwellings located within a Bushfire Management Overlay (BMO), it will be important to consider design requirements such as canopy separation, defendable space, and distance from the dwelling. For these reasons, vegetation has been shown at varying distances from the dwelling assuming flat terrain. These heights are shown in Table 10.1.

Table 10.1: landscape mitigation indicative heights

Nearest Turbine Distance	Vegetation height at 20m from dwelling	Vegetation height at 30m from dwelling	Vegetation height at 50m from dwelling
1.0km	6.6m	9.2m	14m
1.5km	5.0m	6.6m	10m
2.0km	4.1m	5.3m	7.8m
2.5km	3.6m	4.6m	6.6m
3.0km	3.4m	4.1m	5.9m
3.5km	3.1m	3.8m	5.2m
4.0km	2.8m	3.5m	4.7m
4.5km	2.8m	3.3m	4.4m
5.0km	2.6m	3.1m	4.1m
5.5km	2.5m	3.0m	3.9m
6.0km	2.5m	2.9m	3.7m

10.1.3 Bushfire considerations

For properties located within the Bushfire Management Overlay (BMO), any landscape mitigation must not increase bushfire risk to the dwelling and broader landscape. The BMO is triggered by the presence of a tree canopy in excess of five hectares in size. Any property within the BMO is in close proximity to an area of vegetation that could generate extreme bushfire behaviour.

To ensure there is no increase in bushfire risk to an existing dwelling, any landscape mitigation should only consist of trees and shrubs that are in a single row and not introduce multiple layers of vegetation (e.g., canopy, mid-story, and understorey).

Where possible, plantings against existing forested areas should be avoided.

If landscape mitigation is required, a 20-metre buffer between any landscape mitigation planting and existing vegetation, and a 10-metre buffer from the residence should be maintained.

10.1.4 Other considerations

The preceding chapters and supporting photographs demonstrate that vegetation in the region is capable of exceeding the heights required to screen or filter the proposed 250 m high turbines.

However, views and visual impact are unique and diverse from property to property and vary across the site and there may also be constraints or locations where landscape screening may not be suitable or successful. For these reasons, landscape screening would need to be considered on a case-by-case basis.

11. Cumulative Visual Impact

Cumulative visual impact can be defined as the combined effect of changes brought about by a proposed development in conjunction with other similar developments in an area. Cumulative visual impacts may result in changes to the perceptions of the local community or a visitor to the region due to the presence of multiple wind farms in the area. Cumulative visual impacts can occur through either:

- Sequential and simultaneous views to WTGs from publicly accessible viewpoints from the surrounding road network; or
- Simultaneous views of multiple wind farms from private viewing locations.

The greatest potential for cumulative visual impacts to occur is in areas of study area overlap between one or more approved or constructed wind farms in the local area.

There are ten (10) wind farms that are either approved, under construction, operating or proposed within the 28.6 km study area of the proposed Hexham Wind Farm. The nearest operating wind farms to the Hexham Wind Farm are Salt Creek and Dundonnell to the north-east, Mortons Lane to the north-west, Oaklands Hill to the north and Macarthur Wind Farm to the west. Table 11.1 below sets out the name of each of the nine wind farms, the number of approved WTGs, distance and status in relation to the Hexham Wind Farm.

Table 11.1: Wind Farms in proximity to Hexham Wind Farm

Wind Farm	Number of WTGs	Distance & Direction (Approx.)	Status
Dundonnell Wind Farm	80	24 km North-East	Operating
Hawkesdale Wind Farm	26	11 km South-West	Approved
Macarthur Wind Farm	140	23 km West	Operating
Mount Fyans Wind Farm	85	15 km East	Planning Application
Mortlake South Wind Farm	35	13 km North-East	Under Construction
Mortons Lane Wind Farm	13	14.5 km North-West	Operating
Oaklands Hill Wind Farm	32	30 km North	Operating
Ryan Corner Wind Farm	52	38 km South-West	Approved
Salt Creek Wind Farm	15	11 km North-East	Operating
Woolsthorpe Wind Farm	Up to 20	15 km South-West	Approved

The nearest operational wind farm to the project includes Salt Creek and Dundonnell to the north-east. Macarthur is to the west, Morton's Lane to the north-west and Oaklands Hill to the north.

Figure 11.1 shows the approximate location of the constructed and approved wind farms in proximity to the Project and the study area, key highways, major roads and townships.

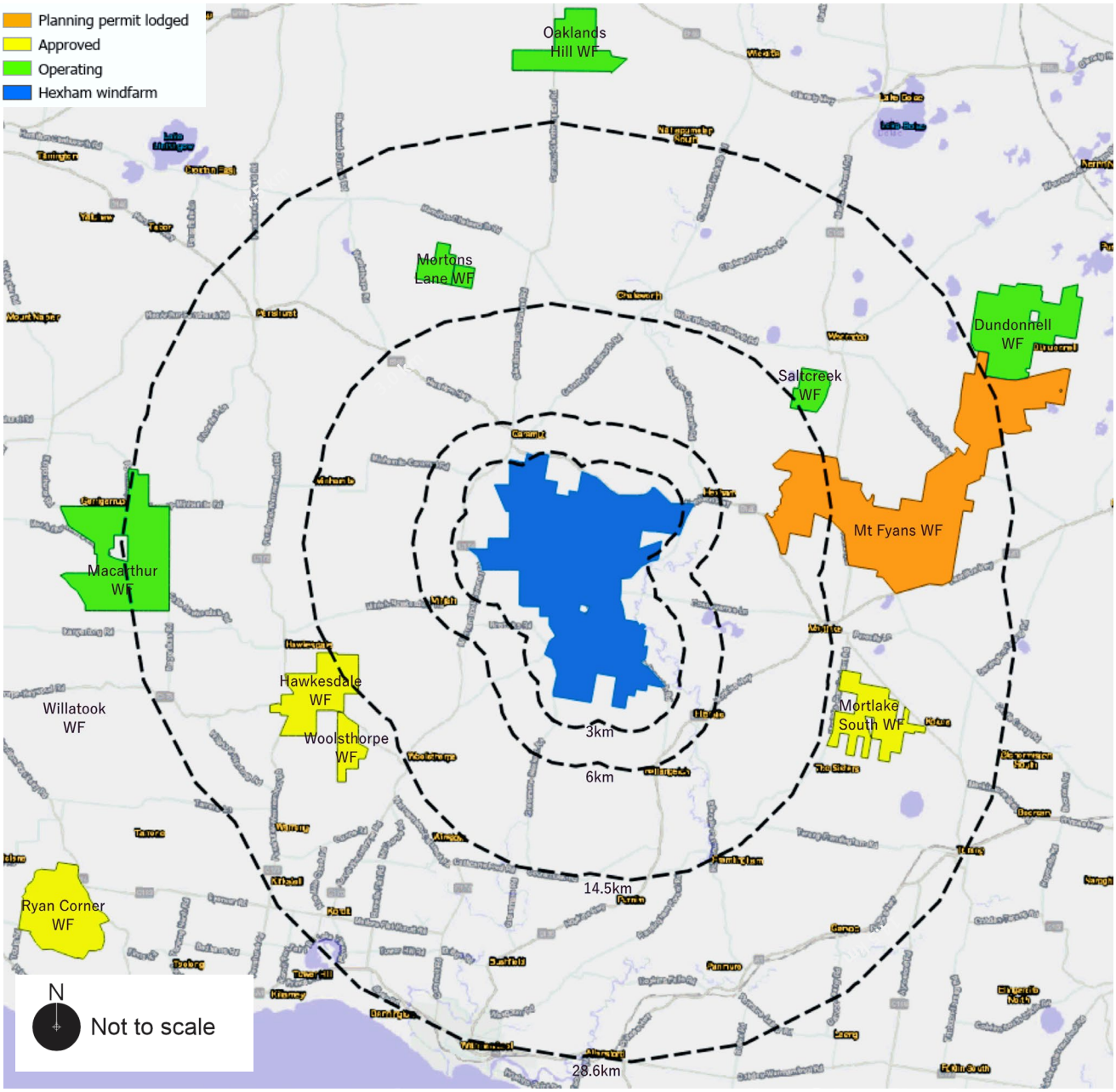


Figure 11.1: Wind Farms in proximity to Hexham Wind Farm

There is the potential for the Hexham Wind Farm to contribute to cumulative visual impacts should it be approved. These include sequential visual impacts from sensitive locations or viewpoints and sequential views from public roads.

11.1 Simultaneous Visual Impact

The potential for simultaneous visual impact to occur is limited to locations where two or more projects are visible from the same location. This would require two or more wind farms to be within the same view cone or direction, or they can be in different directions.

These impacts will be from areas within the study area where the WTGs proposed by the Hexham Wind Farm have the potential to be a visually noticeable element in views that would include other existing and approved wind farms. This distance is defined in Section 4.0 of this report as 14.5 km from a proposed WTG. Beyond this distance, the WTGs may still be a noticeable feature but would not dominate views.

This overlap would occur on sections of the Hamilton Highway, Hopkins Highway and on a number of local roads, such as the Warrnambool - Caramut Road, Terang – Mortlake Road, Mortlake – Ararat Road and the Hexham-Ballangeich Road. These views are usually dominated by the presence of the nearest wind farm and the additional impact created by another wind farm in the distance does not alter the level of impact.

For example, if a viewer is close to the Salt Creek Wind Farm, the addition of the proposed Hexham Wind Farm WTGs to that view would be Negligible. Similarly, if a viewer was located close to the Project and the Mount Fyan's WTGs were also visible, the difference in visual impact created by these additional WTGs would be **Negligible**. Therefore, the simultaneous visual impact of the Project from public roads would be consistent with findings within Section 9 of this Preliminary Landscape and Visual Impact Assessment.

The impact to residential dwellings however would depend partly on visibility of one or more wind farm developments from the dwelling and the proximity of that dwelling with regards to distance and therefore visual scale. This assessment can only be undertaken on an individual basis and if a particular concern has been raised.

11.2 Sequential visual impact

The development of wind farms may lead to a change in people's perception of a region and would be evident as they travel through the road network. Alteration of a landscape would occur when a visitor is able to view two of more wind farms.

11.2.1 Hamilton Highway

The Hamilton Highway is a major east-west route through western Victoria. It runs to the north of the Project and shares part of the site's northern boundary. To the east of the Project, the Hamilton Highway runs between the proposed Mount Fyan's Wind Farm and the Mortlake South Wind Farm which is currently under construction. Further to the east the Highway also passes the recently constructed Salt Creek Wind Farm.

Users of the Hamilton Highway would be aware of the Morton's Lane Wind Farm to the north of the Highway, however, the WTGs are at a distance that they are noticeable, but not dominant. This would be similar for the WTGs for the Mortlake South Wind Farm which is currently under construction.

Viewpoints M2, M3 and M4 discussed in Section 8 of this report assessed the likely views and visual impact of the Project from the Hamilton Highway. Although the proposed WTGs would be highly visible, the visual impact from these locations is not predicted to be greater than **low-moderate** due in part to the high road speed along this section of road that would limit viewing duration and the low sensitivity of the project area to visual change. The potential for cumulative visual impacts from the Hamilton Highway would be moderate.

Views from the Hamilton Highway to the east of Caramut have the potential to include turbines within multiple wind farms including Hexham, Mount Fyans and Mortlake South Wind Farm.

11.2.2 Hopkins Highway

The Hopkins Highway runs generally north south from Warrnambool to Mortlake within the south-eastern section of the Project study area. At its closest to the Project, the Hopkins Highway is approximately 4.3 km to the south-east. This location was assessed at viewpoint M5 of this report. Similar to views from the Hamilton Highway, where drivers on Hopkins Highway are travelling at a speed of 100 km/h and with the Project at rights angles to the travelling direction.

Wind farms that might contribute to cumulative visual impact along the Hopkins Highway include the Mortlake South Wind Farm which is currently under construction to the east and the proposed Mount Fyan's Wind Farm to the north of Mortlake. The Mortlake South Wind Farm is at a similar or greater setback to the Hopkins Highway as the proposed Hexham Wind Farm.

The preliminary cumulative visual impact bought about by sequential views along the Hopkins Highway is considered to be **Low**.

11.2.3 Local

Sequential views to the Project may occur from locations within the local road network such as the Warrnambool - Caramut Road, Terang – Mortlake Road, Mortlake – Ararat Road and the Hexham-Ballangeich Road. To the south-west, this would include views from locations along the Warrnambool – Caramut Road where there is the potential for the approved Hawkesdale and Woolsthorpe Wind Farms to be visible. There is a greater potential for sequential visual

impacts for local roads to north-east where the constructed Salt Creek Wind Farm, the proposed Mount Fyan's Wind Farm and the Mortlake South Wind Farm which is currently under construction may also visible.

The potential for cumulative visual impacts from local roads would be low. The preliminary visual impact from local roads was considered to be low. This rating of low is partly due to the few number or road users travelling along these roads who have the potential to take in view, generally low sensitivity of the landscape in views from these roads and few to no views identified as being significant or notable. Further, the local nature of these roads means that trips are often short in distance and between local origins as opposed to journeys across large areas that have the potential to take in multiple turbines in any one trip. For these reasons, the based on the finding of this preliminary landscape and visual impact assessment, the overall cumulative visual impact from local roads is considered to be negligible to low.

12. Conclusion

The majority of the study area of the proposed Hexham Wind Farm sits within the municipality of Moyne Shire Council. The outer edge of the study area to the north-west sits within the Southern Grampians Shire, the northern edge in Ararat Shire, south-eastern edge in the Corangamite Shire, and a small section to the south sits within the Warrnambool Council area.

The Planning Policy Framework puts in place measures to protect natural features, scenic qualities and prominent views and vistas across the project study area. These include volcanic cones such as Mount Rouse and Tower Hill. These features sit on the outskirts of the study area.

23 viewpoints were selected to provide a representative view from the publicly accessible areas within the study area. The majority of viewpoints were located within 10-15km of the proposed WTGs. Beyond this distance the proposed WTGs would not be as noticeable and therefore viewpoints have been selected where the visual impact would potentially be the greatest.

The preceding analysis has shown that the Project is proposed in an area that has a low sensitivity to visual change and in an area that can accommodate the visual change of the Project. The landscape within the Project study area has been extensively modified in predominantly broad-acre farmland comprising cropping, grazing, and timber plantations.

Although not specifically required by Clause 52.32 we have also included views from 8 local roads within and around the Project. The inclusion of these views provides useful context and further granularity to understand and consider the impacts to the local community. This analysis also gives further detail and information upon which to consider the intricacies of the landscape and the potential views and visual impact that might be experienced from the residential dwellings.

The following summary sets out the conclusions for views and visual impacts as required by Clause 52.32.

12.1 Significant Landscapes - Volcanic Cones

The Planning Policy Framework puts in place measures to protect natural features, scenic qualities and prominent views and vistas across the project study area. These include volcanic cones such as Mount Rouse and Tower Hill. These features sit on the outskirts of the study area.

While Mount Rouse is within the “Landscape Unit 3 – Volcanic Cones” the views from the crater walk are to the farmland. The dominant landscape unit within this view are the “Landscape Unit 2a Farmland - the Plains” and stony rises associated with “Landscape Unit 2b Farmland - the stony rises” towards the base of Mt Rouse.

The proposed WTGs would be visually recognisable under good lighting conditions. At this distance, the WTGs would be in a small portion of this panoramic view and would not be dominant. The views to the surrounding plains and other landscape features would remain even with the addition of the WTGs.

Therefore, the visual impact from volcanic cones is assessed as **Negligible-Nil**.

12.2 Townships

Views to the surrounding landscape from within the townships assessed are predominantly filtered or screened by existing vegetation and buildings. Given the distance and intervening vegetation the visual impact from townships is assessed as **Negligible-Nil**.

12.3 Major Roads

Vegetation located within the roadside and along the fence lines of properties would filter views towards parts of the wind farm. Where breaks in roadside vegetation allow for views to the Project and at distances up to approximately 1.4km WTGs have the ability to dominate the view. However, these WTGs would be perpendicular to the view when

travelling at approximately 100km/hr and viewed over Landscape Unit 2a which has a low sensitivity to visual change. For these reasons the visual impact from major roads is assessed as **Low-Moderate**.

12.4 Local Roads

At distance ranging from approximately 670m the proposed WTGs have the potential to be a dominant element in the view from local roads. Local roads generally have few users and the majority of views are over Landscape Unit 2a which has a low sensitivity for visual change. Existing vegetation in the road reserves and along property lines, would assist to filter views to some WTGs. For these reasons the visual impact from local roads is assessed as **Low.** Views from local roads that traverse the site have been assessed as low to Moderate.

12.5 Cumulative

There is the potential for the Hexham Wind Farm to contribute to cumulative visual impacts should it be approved. These include sequential visual impacts from sensitive locations or viewpoints and sequential views from public roads.

Simultaneous Visual Impact

The greatest potential for simultaneous visual impact contributed to by the Hexham Wind Farm will be from areas generally within 14.5 km of a proposed WTG. Turbines within the Hexham Wind Farm will still be a noticeable feature in views, however they would not be dominant elements in views.

The areas where this overlap may occur is from sections of the Hamilton Highway which runs along the northern boundary of the Project, the Hopkins Highway to the south east and local roads including the Warrnambool - Caramut Road, Terang – Mortlake Road, Mortlake – Ararat Road and Hexham-Ballangeich Road.

Simultaneous visual impact from these locations is partly linked to the visual impact, which have been assessed in this Preliminary landscape and visual impact assessment from significant landscapes and public roads and the distance between projects.

Where viewers are close surrounding wind farms, such as Salt Creek Wind Farm to the north east or Macarthur to the north west, the addition of the proposed Hexham Wind Farm WTGs to these views would be Negligible. Where viewers may be closer to the Hexham Wind Farm such as the approved Woolsthorpe Wind Farm to the west, the change in views and visual impact contributed to by this Project would also be Negligible.

The impact to residential dwellings however would depend partly on visibility of one or more wind farm developments from the dwelling and the proximity of that dwelling with regards to distance and therefore visual scale. This assessment can only be undertaken individually, and where concerns are raised during community consultation and other activities.

Sequential visual impact

The development of wind farms may lead to a change in people's perception of a region and would be evident as they travel through the road network. Alteration of a landscape would occur when a visitor is able to view two of more wind farms.

Hamilton Highway

Viewpoints M2, M3 and M4 discussed in Section 8 of this report assessed the likely views and visual impact of the Project from the Hamilton Highway. Although the proposed WTGs would be highly visible from locations along these roads, the visual impact from these locations is not predicted to be greater than **low-moderate.** This is partly due to the high road speed along this section of road that would limit viewing duration, the low sensitivity of the project area to visual change and limited presence of significant visual features in views that would also include the Project.

Views from the Hamilton Highway to the east of Caramut have the potential to include turbines within multiple wind farms including Hexham, Mount Fyans and Mortlake South Wind Farm.

Hopkins Highway

The Hopkins Highway runs generally north south from Warrnambool to Mortlake within the south-eastern section of the Project study area. At its closest to the Project, the Hopkins Highway is approximately 4.3 km to the south-east. This

location was assessed at viewpoint M5 of this report. Similar to views from the Hamilton Highway, where drivers on Hopkins Highway are travelling at a speed of 100 km/h and with the Project at rights angles to the travelling direction.

Wind farms that might contribute to cumulative visual impact along the Hopkins Highway include the Mortlake South Wind Farm which is currently under construction to the east and the proposed Mount Fyan's Wind Farm to the north of Mortlake. The Mortlake South Wind Farm is at a similar or greater setback to the Hopkins Highway as the proposed Hexham Wind Farm.

The preliminary cumulative visual impact bought about by sequential views along the Hopkins Highway is considered to be **Low**.

Local Roads

The potential for cumulative visual impacts from local roads would be low. The preliminary visual impact from local roads was considered to be low. This rating of low is partly due to the few number or road users travelling along these roads who have the potential to take in view, generally low sensitivity of the landscape in views from these roads and few to no views identified as being significant or notable. Further, the local nature of these roads means that trips are often short in distance and between local origins as opposed to journeys across large areas that have the potential to take in multiple turbines in any one trip. For these reasons, the based on the finding of this preliminary landscape and visual impact assessment, the overall cumulative visual impact from local roads is considered to be negligible to low.

Appendix A. Seen Area Analysis

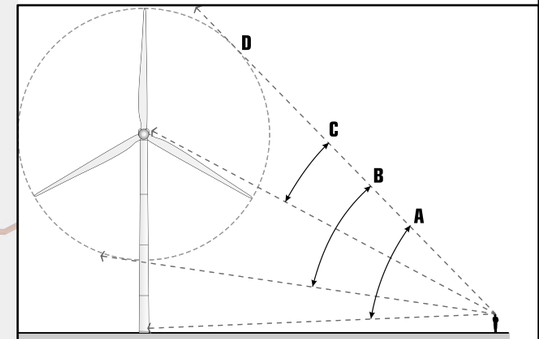
Overall Turbine Visibility

HEXHAM WIND FARM

- Wind turbine location
- Zone of Visual Influence
- Site Extent

Wind Turbine Visibility

- Zone A (one or more entire wind turbine visible)
- Zone B (entire rotor swept path of one or more wind turbine visible
- Zone C (at least half of the rotor swept path of one or more wind turbine visible)
- Zone D(any part of one or more wind turbine is visible



3 km

6 km

16 km

28.6 km

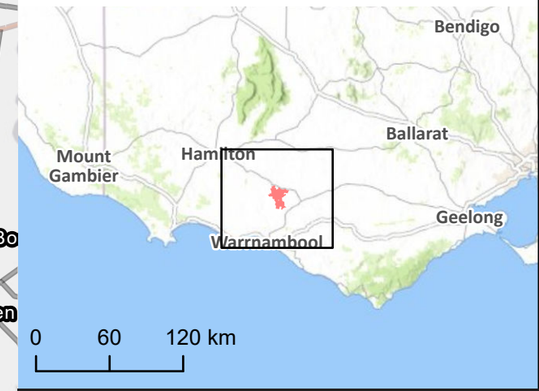
IS279500_OVERALL_Visibility_A3_landscape
Created 14 December 2021 by WardA

N

0 5 10

Kilometres

GDA 1994 MGA Zone 54



LANDFORM ARCHITECTS

Zone C - Hub visibility

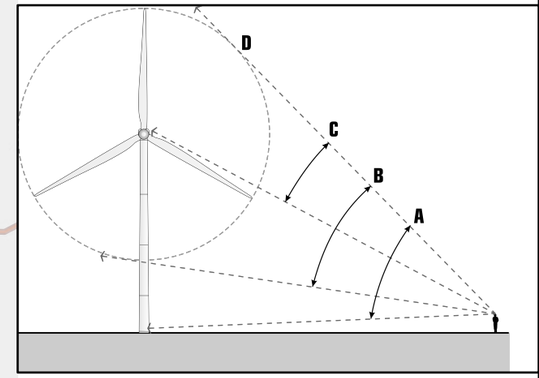
HEXHAM WIND FARM

- Wind turbine location
- Zone of Visual Influence
- Site Extent

Turbine Visibility

Number of visible turbines

- 1 ≤ 27
- 28 ≤ 54
- 55 ≤ 81
- 82 ≤ 108



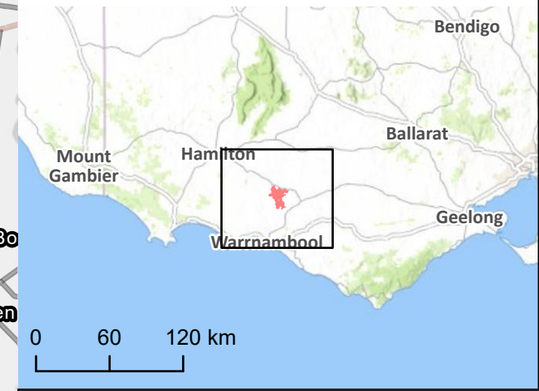
IS279500_C_Hub_Visibility_A3_landscape
Created 14 December 2021 by WardA

N

0 5 10

Kilometres

GDA 1994 MGA Zone 54



LANDFORM ARCHITECTS

Lake Bolac
Narrapumelap South
Nerrin Nerrin
Pura Pu
Chatsworth
Woorndoo
Dundonnell
Darlington
Caramut
Hexham
Minhamite
Gerrigerrup
Penshurst
Warrayure
Lake Linlithgow
Tarrington
Croxton East
Yatchaw
Tabor
Minjah
Hawkesdale
Willatook
Woolsthorpe
Ellerslie
Ballangeich
3 km
6 km
16 km
28.6 km
Mortlake
Kolora
Glenormiston South
The Sisters
Boorcan
Terang
Framlingham
Winslow
Warrong
Tarrone
Kirkstall
Koroit
Burnim
Garvoc
Naroghid
Toolong
Tower Hill
Bushfield
Panmure
Killarney
Dennington
Warrnambool
Allansford
Laang
Port Fairy
Ecklin South
Elingamite North
Cobden
Mepunga West
C148
C178
C176
C175
C183
C184
C173
C156
C164
C167
B140
A1

Appendix B. Murra Warra Trials