14. LANDSCAPE AND VISUAL

14.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) addresses the likely significant landscape and visual impacts of the Proposed Development in the form of a Landscape and Visual Impact Assessment (LVIA). It covers the assessment methodology, as well as a description of the Proposed Development and existing landscape based on relevant guidance. It includes a description of the landscape policy of Co. Clare, with specific reference to wind energy and the LVIA Study Area in which the Proposed Development is located, as well as relevant landscape policy for Co. Tipperary and Co. Limerick, where some visibility of the Proposed Development may also occur.

The landscape of the area is described in terms of its existing character, which includes a description of landscape value and the landscape's sensitivity to change. This LVIA utilises visibility mapping, representative viewpoints, and photomontages to visualise the effects of the Proposed Development. The potential impacts in both landscape and visual terms are then assessed, including cumulative impacts.

14.1.1 Statement of Authority

MKO has developed extensive expertise and experience over the last 15 years in the Landscape and Visual Impact Assessment of a range of projects, including multiple large-scale wind energy developments. The fieldwork and surveys for this LVIA were undertaken by Jack Smith and Jack Workman in 2022 and 2023. The Chapter was written by Jack Smith, then reviewed and finalised by Jack Workman.

This EIAR chapter was written by Jack Smith, MSc., PIEMA, a Landscape and Visual Impact Professional. Jack holds a MSc. in Environmental Leadership from the University of Galway and is a Practitioner member of the Institute for Environmental Management and Assessment. Jack is a Project Environmental Scientist and LVIA specialist with MKO. Jack is an Affiliate member of the British Landscape Institute and holds membership with the Landscape Research Group. Jack's primary role at MKO is producing the LVIA chapter of EIA reports. Jack specialises in preparing LVIA reports for large-scale renewable energy projects including wind farms, solar farms, quarry extraction and strategic housing schemes. Jack has additional experience in preparing landscape feasibility reports for large wind farm projects.

The LVIA was finalised by Jack Workman MSc, TMLI. Jack is member of the British Landscape Institute as a Technician Member (TMLI) and he is the Landscape & Visual Project Director at MKO. He is an Environmental Scientist and LVIA specialist. Jack Workman's primary role at MKO is producing the LVIA chapter of EIA reports for large infrastructure developments. Jack holds an MSc. in Coastal and Marine Environments and a BSc. in Psychology, he is a member of the Landscape Research Group, as well as holding a membership with the Chartered Institute of Water and Environmental Management.

14.1.2 Proposed Development Description

A full and detailed description of the Proposed Development can be found in Chapter 4: 'Description' of this EIAR. Section 4.1 of that chapter describes the development and its component parts, including the works subject of a proposed application for planning permission to An Bord Pleanála; these works are summarised here.

This planning application seeks a ten-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm.

14.1.2.1 In-Text Reference to the Proposed Development

The following references are used throughout this chapter:

- Where the 'Proposed Development' is referred to, this relates to all the project components described in detail in Chapter 4 of this EIAR i.e. Wind Farm Site and Grid Connection as detailed below.
- The **'proposed turbines'** refers to the turbine components of the Proposed Development;
- Where **'the Site'** is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as defined and shown on Figure 1-1 in Chapter 1.
- Where the **'Wind Farm Site'** is referred to, this refers to turbines and associated foundations and hard-standing areas, meteorological mast, junction accommodation works, access roads, temporary construction compounds, 110kV electrical substation, underground cabling, borrow pits, site drainage, tree felling and all ancillary works. The Wind Farm Site is shown in Figure 1-1a of Chapter 1.
- Where **'Grid Connection'** is referred to, this refers to the underground 110kV electrical cabling and all associated site development works connecting the Wind Farm Site to the existing Ardnacrusha 110kV electrical substation. The Grid Connection is shown in Figure 1-1b of Chapter 1.
- The **'Western Cluster'** refers to 3 No. proposed turbines: T1, T2 and T3, sited at the western extent of the Proposed Development around the peak of Knockanuarha in the townland of Snaty;
- The **'Central Cluster'** refers to 4 No. proposed turbines: T4, T5, T6 and T7, sited in the townlands of Knockshanvo and Cloontra East; these turbines are located in a central position relative to the Western and Eastern turbine clusters;
- The '**Eastern Cluster'** refers to 2 No. proposed turbines: T8 and T9, sited at the eastern extent of the Proposed Development in the townland of Mungboy;

14.1.2.2 Essential Aspects of the Proposed Development from a Landscape and Visual Impact Assessment (LVIA) Perspective

The Guidelines for Landscape and Visual Impact Assessment 3rd Edition (hereafter, GLVIA3) (Landscape Institute & Institute of Environmental Management and Assessment [LI & IEMA], 2013) states that:

> *'It is important to make sure that the project description provides all the information needed to identify its effect on particular aspects of the environment. For LVIA, it is important to understand, from the project description, the essential aspects of the scheme that will potentially give rise to its effect on the landscape and visual amenity'.*

The tall, vertical nature of the proposed turbines make them the most prominent elements of the Proposed Development from a landscape and visual perspective and, as such, are deemed to have the most potential to give rise to 'Significant' landscape and visual effects. In this regard, the proposed turbines are considered the 'essential aspect' of the Proposed Development which will give rise to effects on the landscape and visual amenity and are therefore the primary focus of the LVIA conducted in this chapter.

Other elements of the Proposed Development are not deemed to be as visually prominent as the proposed turbines; however, they also may have potential to give rise to localised landscape and visual effects. Although not the primary focus of this LVIA, these elements are given due consideration and assessment throughout this chapter.

14.1.2.3 Range of Turbine Dimensions Assessed in this Chapter

As detailed in Chapter 1 of this EIAR, the proposed turbines to be installed on the site will have a ground-to-blade tip height, hub height and blade length with the following dimensions:

- Turbine Tip Height – Maximum height 185 metres, Minimum height 179.5 metres;
- Hub Height – Maximum height 110.5 metres, Minimum height 102.5 metres;
- Rotor Diameter – Maximum length 163 metres, Minimum length 149 metres.

The range of different turbine envelopes shown above are considered and assessed in this LVIA. The different turbine models assessed include both the minimum and maximum extents of the range and are discussed below.

Primary Turbine Model used for Assessment in the LVIA and the Photomontage Booklet

Throughout this LVIA, a turbine model comprising a rotor diameter of 149m and a hub height of 110.5m and max tip height of 185m is considered to be the primary representative illustration of the Proposed Development and was used for all photomontage viewpoints in the *EIAR Volume 2: Photomontage Booklet* (hereafter, *Photomontage Booklet*) and used for ZTV mapping.

On the basis of professional judgement and on consideration of the range of turbines which could be installed, the following combination of rotor diameter and hub height has been identified as the most representative for assessment in this LVIA, this configuration is termed as '**Maximum Tip Height, Maximum Hub Height, Minimum Rotor Diameter'**:

- 'Maximum Tip Height, Maximum Hub Height, Minimum Rotor Diameter' – All 16 No. Viewpoints.
  - Maximum Tip Height – 185 metres;
  - Maximum Hub Height – 110.5 metres;
  - Minimum Rotor Diameter – 149 metres.

The turbine configuration above has been selected within the proposed range for inclusion for all viewpoints within the photomontage booklet (and all photowires in Appendix 14-4). The basis for this selection is that this combination is likely to show the greatest extent of the entire turbine structure (hub, blades and tower) and is likely to be the most visible from the Viewpoints assessed in this LVIA. The hub (or 'Nacelle') of a turbine is a prominent focal point and the visual prominence of a turbine is typically increased if the hub is viewed above a landscape feature, rather than below. Therefore, the turbine configuration above (Tip Height 185: Hub Height 110.5m; Rotor Diameter 149m) which incorporates the maximum hub height and maximum tip height is likely to increase the visual prominence of turbines and represents a worst case scenario for likely significant landscape and visual effects within the range proposed. This turbine configuration constitutes the tallest height for the purposes of modelling Half-Blade Zone of Theoretical Visibility (ZTV) Maps and was the model used

for all ZTVs in in this Chapter. The ZTV map generated from the proposed turbines is presented and discussed in Section 14.3.

Assessing the Turbine Range Using Photomontages and Comparative Wirelines

Photomontage visualisations are the best LVIA tool to assess any likely effects arising due to differences of turbine configurations used within the proposed range.

Irrespective of which combination of hub height and blade length within the range is installed on-site, the significance of residual landscape and visual effects will not be altered. However, for the avoidance of doubt, two alternative turbine configurations are presented for four selected viewpoints included in the *Photomontage Booklet* accompanying this document, these configurations are termed 'Maximum Tip Height, Intermediate Hub Height, Maximum Rotor Diameter', and 'Minimum Tip Height, Minimum Hub Height, Intermediate Rotor Diameter'. The viewpoints selected are representative of short-range views (photomontage VP13), medium-range views (VP15, VP16), and longer-range views (VP14). The photomontage assessment tables for these viewpoints contained in Appendix 14-3 include a comment addressing the alternative turbine configurations and confirm that the turbine configuration ultimately installed on-site will not alter the assessment of residual visual effects.

The dimensions and configurations of the 'Maximum Tip Height, Intermediate Hub Height, Maximum Rotor Diameter' and 'Minimum Tip Height, Minimum Hub Height, Intermediate Rotor Diameter' used for the assessment are detailed below:

- 'Maximum Tip Height, Intermediate Hub Height, Maximum Rotor Diameter' – 4 photomontage viewpoints:
  - Maximum Tip Height – 185 metres;
  - Intermediate Hub Height – 103.5 metres;
  - Maximum Rotor Diameter – 163 metres.

- 'Minimum Tip Height, Minimum Hub Height, Intermediate Rotor Diameter'– 4 photomontage viewpoints:
  - Minimum Tip Height – 179.5 metres;
  - Minimum Hub Height – 102.5 metres;
  - Intermediate Rotor Diameter – 154 metres.

Differences in the turbine range are only discernible through the aid of a comparative wireline view where the different model is overlain the other configuration used for all viewpoints (See Section 1.5.5 In Appendix 14-1 – LVIA Methodology for more information on comparative wireline views presented). ZTV mapping is not a useful tool for analysis or assessment of differences arising in landscape effects due to turbine range as no discernible change to ZTV outputs will occur considering the small range and the coarse resolution of ZTVs.

Discussion and analysis of likely effects arising due to differences in the proposed turbine range are included in Section 14.7.4. As demonstrated by the turbine ranges presented in the *Photomontage Booklet*, irrespective of which combination of tip height, hub height and rotor diameter within the range outlined in this application is installed on-site, the significance of residual landscape and visual effects will not be altered as set out below in this LVIA, Section 14.7: 'Likely Significant Landscape and Visual Effects'.

14.1.3 Mitigation by Design

The Proposed Development Site was strategically selected as a landscape highly suitable for the development of wind energy. Through the iterative project design process, various best practice tools for assessing the landscape and visual impact of a proposed wind farm development were utilised to bring forward the optimum design for the Proposed Development with respect to landscape and visual

factors. These tools include landscape modelling, Zone of Theoretical Visibility (ZTV) mapping and the preparation of photomontage visualisations.

The final design of the Proposed Development and strategic siting of turbines in the landscape was informed by extensive early-stage impact assessment work conducted in 2022. This included a Landscape Capacity Assessment which analysed and evaluated the viability of the three separate and distinct turbines clusters from a landscape and visual perspective, including analysis of potential effects on residential visual amenity. The evolution of the turbine layout included omission of turbines from the project and careful micro-siting of turbines aimed at preventing the potential for 'Significant' landscape and visual effects. Details of the various turbine layout iterations included as part of this design process are included in Chapter 3: 'Consideration of Reasonable Alternatives' of this EIAR.

The following subsections establish several specific 'mitigating' factors which were key to the design of the Proposed Development and topics which were the focus of early-stage landscape capacity studies:

- Strategic siting in a suitable landscape capable of absorbing a wind energy development;
- Project layout and design;
- The appropriateness of three separate turbine clusters and effects on Residential Visual Amenity
- Offset of impacts on local recreational amenities (12 O'Clock Hills);

14.1.3.1 Siting in a Suitable Landscape for Wind Energy Development

During the initial site selection process, landscape sensitivity was identified as a key constraint and so landscapes considered to be less sensitive were preferred over sites with more sensitivity to change. The following factors detail why the Proposed Development Site was strategically selected as a landscape highly suitable for the development of wind energy:

- The Proposed Development is sited in a landscape designated as a 'Strategic Area' for wind energy development in local planning policy (Clare Wind Energy Strategy, which forms Volume 6 of the Clare County Development Plan 2023–2029);
- The Proposed Development is sited in Co. Clare Landscape Character Area (LCA) No. 8 – *Slieve Bernagh Uplands*. With regards to wind energy development, this LCA is afforded the lowest sensitivity designation/category attributable to LCAs in Co. Clare, as detailed in *Table 4a* of the Clare Wind Energy Strategy;
- The Wind Farm Site comprises an upland landscape with landcover and land-use characterised by commercial forestry, the Wind Farm Site itself is therefore a modified working landscape of low sensitivity;
- The proposed turbines are sited in a sparsely settled upland landscape. It is a large-scale landscape with the capacity to effectively accommodate a wind energy development. The nature and location of the upland landscape provide adequate set-back distance from large population centres, thereby limiting the extent of landscape and visual impact upon large numbers of receptors;
- The topographical characteristics of the upland site and wider landscape setting limit the visual exposure of the proposed turbines. Well defined ridgelines and landforms in the upland landscape obscure visibility of turbines from large population centres and high sensitivity landscape and visual receptors in the wider landscape setting (the LVIA Study Area).

14.1.3.2 Project Layout and Design

Details of the various project design iterations and the considerations related to potential landscape and visual effects are described in detail in Chapter 3 of this EIAR. The project layout that is the subject of

this LVIA, already incorporates the following landscape and visual design considerations for best practice wind farm design which was informed by a Landscape Capacity Assessment in 2022:

- Initial turbine layouts included 18 No. turbines within the viable landscape of the Proposed Development Site. Through the iterative design process, the number of proposed turbines was reduced by half, to 9 No. proposed turbines. Effects on the landscape and visual amenity were of primary consideration at an early stage and was a key factor warranting a reduction of the number of proposed turbines on the Site;
- The final proposed design of the project including the 9 No. proposed turbines is deemed appropriate and adequate for the landscape of the Site, sympathetic to the rolling upland landscape;
- The use of three separate turbine clusters balances the need to maximise the potential renewable energy output from this suitable landscape resource, whilst ensuring adequate set-back and visual screening from key sensitive receptors;
- Siting of proposed turbines adheres to the minimum 500 m set-back distance in the Wind Energy Development Guidelines for Planning Authorities (WEDGs) (Department of the Environment, Heritage and Local Government or DoEHLG, 2006); and also, the 4-times-tip-height set-back distance explicitly set out for residential visual amenity prescribed by the Draft Revised Wind Energy Development Guidelines (Draft Revised WEDGs) (Department of Housing, Planning and Local Government or DoHPLG, 2019). The Proposed Development includes for a greater than 750m set-back distance from residential receptors, a distance greater than 10m beyond the minimum recommendations (4 × Tip Height at 185 m = 740 m) in the WEDGs and Draft Revised WEDGs (which although is not adopted guidance, is widely accepted as best practice);
- New recreational amenities are proposed as part of the Proposed Development (see description below in Section 14.1.3.4: 'Offset of Visual Impact on 12 O'Clock Hills: Provision of Recreational Amenities') to offset impacts upon locally valued recreational and scenic amenities around the 12 O'Clock Hills. The proposed construction of a new section of recreational walking trail and new landscape viewing decks will enable enjoyment of this landscape and new access to uninterrupted high quality scenic amenity;
- The proposed turbines are generally seen clustered around a hilltop within views from the surroundings of the Wind Farm Site. This siting is aligned with the guidance on siting of wind energy developments in the WEDGs (DoEHLG, 2006, p.37);
- In general, the spatial extent of the proposed turbines seen within the existing views is appropriate relative to the scale of the hills in which the turbines are clustered around and within; in this regard, the proposed turbines are also aligned with the guidance on spatial extent and scale in the WEDGs (DoEHLG, 2006, p.40–41).
- The proposed Grid Connection is underground and follows the local road network and existing forestry tracks, thereby eliminating potential landscape and visual effects during the operational phase;
- The proposed 110kV substation is sited within the existing forestry on the Wind Farm Site, thus it will be entirely screened from view outside of the areas in immediate proximity to the Site;
- The internal site road layout makes use of the existing forestry tracks wherever possible (to be upgraded for construction and delivery of wind turbine components), to minimise the requirement for new tracks within the site;
- Felling of existing coniferous plantation is predominantly limited to keyhole felling in localised parts of the Wind Farm Site, in keeping with existing practices in the commercial forestry plantation on-site.

14.1.3.3 Appropriate Landscape for Three Separate Turbine Clusters:

The turbine layout comprises three distinct and separate turbine clusters (Western, Central and Eastern; defined above). It was necessary to design three separate turbine clusters to maximise the use of viable

designated 'Strategic Area' of the landscape in mind of the environmental constraints addressed in this EIAR, including landscape and visual effects. During the project design it was necessary to consider the coherency of all three separate turbine clusters from an LVIA perspective and to address the potential for surrounding effects on local residential visual amenity. Preliminary landscape and visual analyses were conducted to address these topics and determine the overall capacity of the landscape to accommodate the Proposed Development. A detailed analysis was informed by site visits, comparative ZTV mapping for the three distinct turbine clusters, as well as the production of photomontage visualisations of early iterations of the turbine layout from the most sensitive receptors and locations where visibility of turbines in opposing directions from local residences could potentially occur. The Landscape Capacity Assessment established the following:

No Surrounding Effects on Local Residential Amenity

- Due to the narrow and undulating nature of the intervening valleys between the turbine clusters, no 'Significant' effects are likely to occur on surrounding local residential amenity in these areas. Where views of the turbines are theoretically possible in multiple directions, these in reality are screened from view by intervening vegetation or topography;
- Owing to the orientation and positioning of residences relative to the proposed turbines, as well as intervening landforms and other above ground features of the landscape, it results in limited 'Significant' impacts upon local residential visual amenity.

Visual Separation

Whilst there is some visual separation and slight geographic disconnection between the different turbine clusters when looking at the layout on a map, the following factors were given due consideration throughout the early-stage design process:

- As shown by all visualisations (photomontages and 'photowires' [early-stage photomontages]), views in close proximity to the Wind Farm Site (within 3km of the proposed turbines) generally comprise only one or two turbine clusters in a similar direction (i.e. not surrounding the viewer); further, it is uncommon to experience views of all three turbine clusters at once, thereby reducing the turbine visibility as well as visual impact on local receptors;
- The collective visual impact of all three turbine clusters is limited to receptors in the wider landscape area where larger set-back distances occur (generally >3km); further, the separate turbine clusters are generally well assimilated and well absorbed within the undulating upland landscape, in that the turbines are either seen as cluster or are contained to the highest elevated areas in view (this aligns with the guidance on siting of wind energy developments in the WEDGs (DoEHLG, 2006, p.37). In this regard, as noted previously, the spatial extent of the proposed turbines seen within views is appropriate relative to the scale of the hills in which the turbines are clustered around and within, thus the proposed turbines are also aligned with the guidance on spatial extent and scale in the WEDGs (DoEHLG, 2006, p.40–41).

14.1.3.4 Offset of Visual Impact on 12 O'Clock Hills: Provision of Recreational Amenities

The Wind Farm Site includes some locally valuable recreational walking trails and amenities in the area known locally as the 12 O'Clock Hills. At the summit of the 12 O'Clock Hills Waymarked Walking Trails is an existing viewing area located at the peak of Knockanuarha (The peak - as identified on Ordnance Survey of Ireland [OSi] maps) at the western extent of the Wind Farm Site. The viewing area is currently accessed via existing walking trails through commercial forestry land. The viewpoint and

trails are of local value, featuring open, long-ranging landscape views from the most elevated vantage point, a location positioned in the centre of the Western Cluster (amongst turbines T1, T2 and T3). Early-stage LVIA appraisals identified that the proposed turbines will likely give rise to 'Significant' effects on visual amenity from this viewpoint and some areas of the walking trails. Therefore, plans for new recreational amenities form part of the Proposed Development in order to offset potential impacts on these local recreational amenities.

New recreational amenities are incorporated into the Planning Drawings and Planning Pack accompanying this EIAR. These amenities include for the provision of a section of new recreational walking trail, as well as new viewpoints and amenity resources at the western extent of the Wind Farm Site which link with existing trails and amenities. The proposed amenities are included in the site-layout drawings as part of the planning pack and a map of the existing and proposed amenities is included below in Figure 14-25; moreover, Section 14.7.3.3.3 'Visual Effects (Operational Phase)' provides discussion, photos and examples.

The proposed amenities include provision of the following:

- A new safe and accessible section of waymarked walking trail and maps that link with the existing walking trails and viewpoints. Safety is improved as the area of new walking trail enables access to new areas of the hill and eliminates the requirement for walkers to walk on a portion of the local road network;
- 2 No. new viewing areas and an upgrade of an existing viewing area in the townland of Snaty (See Fairy Trail View; Wilson Way View; Lower Summit in Figure 4-15 of Chapter 4). These new viewing decks permit long ranging and uninterrupted (by turbines) landscape views of a high scenic quality in multiple directions which are not significantly impacted by the proposed turbines or any other wind energy projects.
- Picnic benches and signage are proposed within viewing areas, providing educational information and visualisations about the landscape of the site and wider setting;
- The construction methodology for the Proposed Development ensures access to the peak of 12 O'Clock Hills (Knockanuarha) during the construction phase of the Proposed Development, with the exception of a maximum of 9 No. days (weather dependent) during which peak access will be closed while the proposed turbines of the Western Cluster are erected.

Whilst the proposed turbines will cause a 'Significant' impact on the existing views at the 12 O'Clock Hills viewpoint (photomontage VP12; assessed in full below in Section 14.7), the proposed design and construction of a new section of recreational walking trail and new viewing areas included as part of the Proposed Development will enable the continued experience, enjoyment and appreciation of landscapes and scenic amenity of equivalent quality in that area. An example of a similar viewing area as proposed is shown below.

Plate 14-1 Example Viewing Area- Created within the Slieve Bawn Wind Farm Site 115

14.1.4 Assessment of Alternative Turbine Designs and Layouts

The potential landscape and visual impacts of the Proposed Development were considered as part of the early-stage design process. Alternative turbine envelope specifications were generated for a series of preliminary ZTVs and photomontages in order to assess the extent to which alternative turbine designs and layouts may give rise to visual effects. These early-stage assessments enabled the choice of suitable and appropriately scaled turbines and turbine layout for the Proposed Development in mind of mitigating landscape and visual effects. For more information on alternative designs, please see Chapter 3 of this EIAR.

14.1.5 Scoping Replies / Pre-Planning Meeting

Local Planning Authority

A scoping and consultation exercise has been carried out by MKO with Clare County Council and others, as detailed in Chapter 2 of this EIAR: *Background*.

A pre-application consultation meeting was held on 5th of April 2023; the meeting was attended by representatives of Clare County Council, FEI and MKO. MKO presented an overview of the scope of the LVIA to be included in this chapter of the EIAR including ZTV mapping and photomontages, and noted the key sensitive receptors which were to be assessed. Clare County Council representatives shared their interest in seeing assessment of the 12 O'Clock Hills and views to the north from the viewpoint at the top of the hill which represents recreational receptors of local sensitivity. Effects on views from walking trails and viewpoints from the 12 O'Clock Hills are comprehensively addressed in this chapter using photomontages as per the request by the planning authority, as well as feedback from local community groups in the local area.

A second meeting with representatives from Clare County Council took place on the 7th of December 2023 via MS teams. The MKO project team gave an update of the Proposed Development and outlined the scope of the cumulative impact assessments to be undertaken.

This chapter has assessed the likely landscape and visual impacts of the Proposed Development on the landscape and visual receptors discussed at these pre-planning meeting. A detailed summary of the topics discussed at the pre-planning meeting is provided in Section 2.6.4 'Pre-Planning Meetings' of Chapter 2 of this EIAR.

An Bord Pleanála – Pre Application Consultation Meeting (Case Number ABP-319215-24)

A pre-application consultation meeting was held with An Bord Pleanála on the 4th of April 2024 under Section 37B of the Planning and Development Act 2000, as amended. The topic of cumulative landscape and visual effects was discussed in mind of the several other permitted and proposed wind energy developments in the Slieve Bernagh Uplands area of East Clare. The MKO Landscape and Visual team provided an overview of the layout of the photomontage booklet, and how it has been designed to ensure robust landscape and visual assessment of the Proposed Development in combination with the other wind energy developments in the surrounding landscape. The Board agreed with the approach taken to illustrate potential cumulative effects in the photomontage booklet. The Board highlighted the importance of ensuring there is information to aid the everyday user (e.g. the general public) in reading the photomontage booklet; particularly in a scenario where things can be slightly complex with the cumulative status of wind energy development in this area. MKO have incorporated user manuals into the *Photomontage Booklet* to ensure clarity and direction for those viewing the photomontages.

14.2 Brief Methodology and Assessment Criteria

This section broadly outlines the methodology and the guidance used to undertake the LVIA of the Proposed Development; a more detailed description of the methodology is outlined in Appendix 14-1: *LVIA Methodology*. There are five main sections to this assessment:

- Visibility of the Proposed Development (e.g. ZTV Mapping);
- Landscape Baseline;
- Visual Baseline;
- Cumulative Context;
- Likely and Significant Effects – outlining the assessment of landscape, visual and cumulative effects.

14.2.1 Scope and Definition of the LVIA Study Area

Chapter 14 follows the naming conventions and definitions detailed in Section 1.1.1 of Chapter 1 of this EIAR: *Introduction*. In this Chapter, where the 'the Site' is referred to, this relates to the primary study area for the EIAR, the immediate environment in which the Proposed Development is located including both the proposed Wind Farm Site and Grid Connection. The Site is delineated by a green line labelled as the 'EIAR Site Boundary' in the A0 baseline map in Appendix 14-4: *LVIA Baseline Map*, as well as other mapping figures shown below in Section 14.4 'Landscape Baseline'. Where the 'Wind Farm Site' is referred to in this Chapter, this refers to the upland areas where the proposed turbines and associated wind farm infrastructure are located. The Wind Farm Site is shown in Figure 1-1a of Chapter 1.

The GLVIA3 (LI & IEMA, 2013) refers to the identification of the area of landscape that is to be covered while assessing landscape and visual effects. These guidelines state:

'The study areas should include the site itself and the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner'.

Landscape and visual baseline mapping and viewpoint selection are based on a wider study area referred to as the 'LVIA Study Area'. The geographical parameters for this LVIA were determined by desktop studies, survey work undertaken and the professional judgement of the assessment team, as well as experience from other relevant projects and policy guidance or standards, including:

- Appendix 3 'Landscape Impact Assessment of Wind Energy Development Proposals', WEDGs (DoEHLG, 2006) (including reference to the Draft Revised WEDGs, DoHPLG, 2019);
- GLVIA3 (LI & IEMA, 2013).

The distance at which a ZTV is set from a proposed wind farm development usually defines the parameters of the LVIA Study Area. In this chapter, the LVIA Study Area was chosen as 20km for landscape and visual effects, as is suggested by guidance (WEDGs, DoEHLG, 2006, p.94; Draft Revised WEDGs, DoHPLG, 2019, p.152):

'For blade tips in excess of 100m, a Zone of Theoretical Visibility radius of 20km would be adequate'.

Through experience conducting LVIA for other wind energy development projects, the assessment team determined that no significant effects on landscape character are likely to arise beyond distances of 15km from the proposed turbines. Therefore, a Study Area of 15km was chosen for assessing effects on landscape character in relation to designated Landscape Character Areas (LCAs) – termed the 'LCA Study Area'.

Furthermore, on the basis of desk studies and survey work undertaken, the professional judgement of the assessment team, experience from other relevant projects and policy guidance or standards, the following topic areas have been scoped out of the assessment:

- Effects on landscape and visual receptors that have minimal or no theoretical visibility (as predicted by ZTV mapping) and are therefore unlikely to be subject to 'Significant' effects;
- Effects on designated landscape receptors beyond a 20 km radius from the proposed turbines, from where it is judged that potential 'Significant' effects on key characteristics and/or special qualities, or views are judged unlikely to occur;
- Effects on landscape character and designated LCAs beyond a 15km radius from the proposed turbines, where it is judged that potential 'Significant' effects on landscape character are unlikely to occur;
- Effects on visual receptors beyond a 20km radius from the proposed turbines, where it is judged that potential 'Significant' effects are unlikely to occur;
- Cumulative landscape and visual effects beyond a 20km radius from the proposed turbines, where it is judged that potential 'Significant' cumulative effects are unlikely to occur.

The tall, vertical nature of the proposed turbines make them the most prominent elements of the Proposed Development from a landscape and visual perspective and have the most potential to give rise to 'Significant' landscape and visual effects. The landscape and visual impact of ancillary elements such as the proposed roads, substation, met mast and Grid Connection are also addressed within this chapter; however, the proposed turbines are the primary focus of this LVIA.

14.2.2 Guidelines

The legislation and general guidance on Environmental Impact Assessment is set out in Chapter 1 of this EIAR. The LVIA reported in this chapter was based on and informed by guidance documentation

specifically pertaining to LVIA. Details of the guidance used to conduct this LVIA are outlined in Section 1.3 'Guidelines' of Appendix 14-1: *LVIA Methodology*.

14.2.3 Baseline Landscape and Visual Information

In order to carry out this assessment, an initial desk study of baseline information was undertaken that has informed the LVIA, and this included the following:

Landscape

- Policies and objectives contained in the relevant county development plans (Co. Clare; Co. Tipperary; Co. Limerick) pertaining to landscape and wind energy;
- Landscape designations in the LVIA Study Area (protected high-sensitivity landscapes (e.g. Co. Clare 'Heritage' Landscapes); Scenic Routes and Scenic Views; LCAs);
- Landscape character of the LVIA Study Area;
- Landscape character of the Site:
  - Determined from sites surveys undertaken in 2022 and 2023;
  - Landscape character of the site in the context of Landscape Character Types identified from Section 6.9 'Landscape Character Types as a Basis for Guidelines' of the WEDGs (DoEHLG, 2006) and Draft Revised WEDGs (DoHPLG, 2019).

Visual

- Identification of visual receptors in the LVIA Study Area;
- Preliminary assessments of visibility of the Proposed Development from visual receptors using ZTV mapping and on-site appraisals;
- Route Screening Analysis (RSA).

14.2.4 Assessment of Potential Impacts

The landscape and visual assessment methodology used in this chapter (outlined in Appendix 14-1: *LVIA Methodology*) includes clearly documented methods based on the GLVIA3 (LI & IEMA, 2013). This includes consideration of landscape and visual sensitivity balanced with the magnitude of change to determine the significance of effects. Potential for cumulative effects are also considered and accounted for in these determinations and judgements. Mitigating factors are then taken into consideration to arrive at residual landscape and visual effects. Residual landscape and visual effects are graded upon an 'impact assessment classification of significance' scale, as defined by the 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' from the Environmental Protection Agency of Ireland (EPA, 2022).

Photomontages are used to assess potential impacts, whereby the potential effects arising as a result of the proposed turbines are assessed from viewpoint locations representative of prominent landscape and visual receptors located within the LVIA Study Area. Throughout this chapter, 'theoretical visibility' is referred to, based on ZTV mapping which is presented in the following section of this chapter. Further details of the methods used to produce ZTV maps and photomontages, as well as the LVIA process, including assessment of cumulative effects are presented in Appendix 14-1.

14.3 Visibility of the Proposed Development

14.3.1 ZTV Mapping: Theoretical Visibility of the Proposed Turbines

Zone of Theoretical Visibility (ZTV) mapping is an important step in the LVIA process, in that it clearly shows which areas have theoretical visibility of the proposed turbines and which areas have no theoretical visibility. The ZTV mapping methodology outlined in Section 1.3 'Zone of Theoretical Visibility Mapping' of Appendix 14-1: *LVIA Methodology* was used to examine the theoretical visibility of the 9 no. proposed turbines from all landscape and visual receptors within the LVIA Study Area, using the half-blade height of the wind turbines as points of reference, called the Half-Blade ZTV or ZTV, and with the associated map called the ZTV map. As detailed previously in Section 14.1.2.3, the turbine model used for the generation of ZTVs includes the 'Maximum Tip Height, Maximum Hub Height, Minimum Rotor Diameter' which represents the greatest visual exposure for a Half-Blade ZTV within the range of turbine dimensions proposed.

The WEDGs (p.94) (DoEHLG, 2006) and Draft Revised WEDGs (p.152) (DoPHLG, 2019) note that:

> *"It is recommended that the Zone of Theoretical Visibility should assess the degree of visibility based on the numbers of turbines visible to half the blade length in addition to hub-height".*

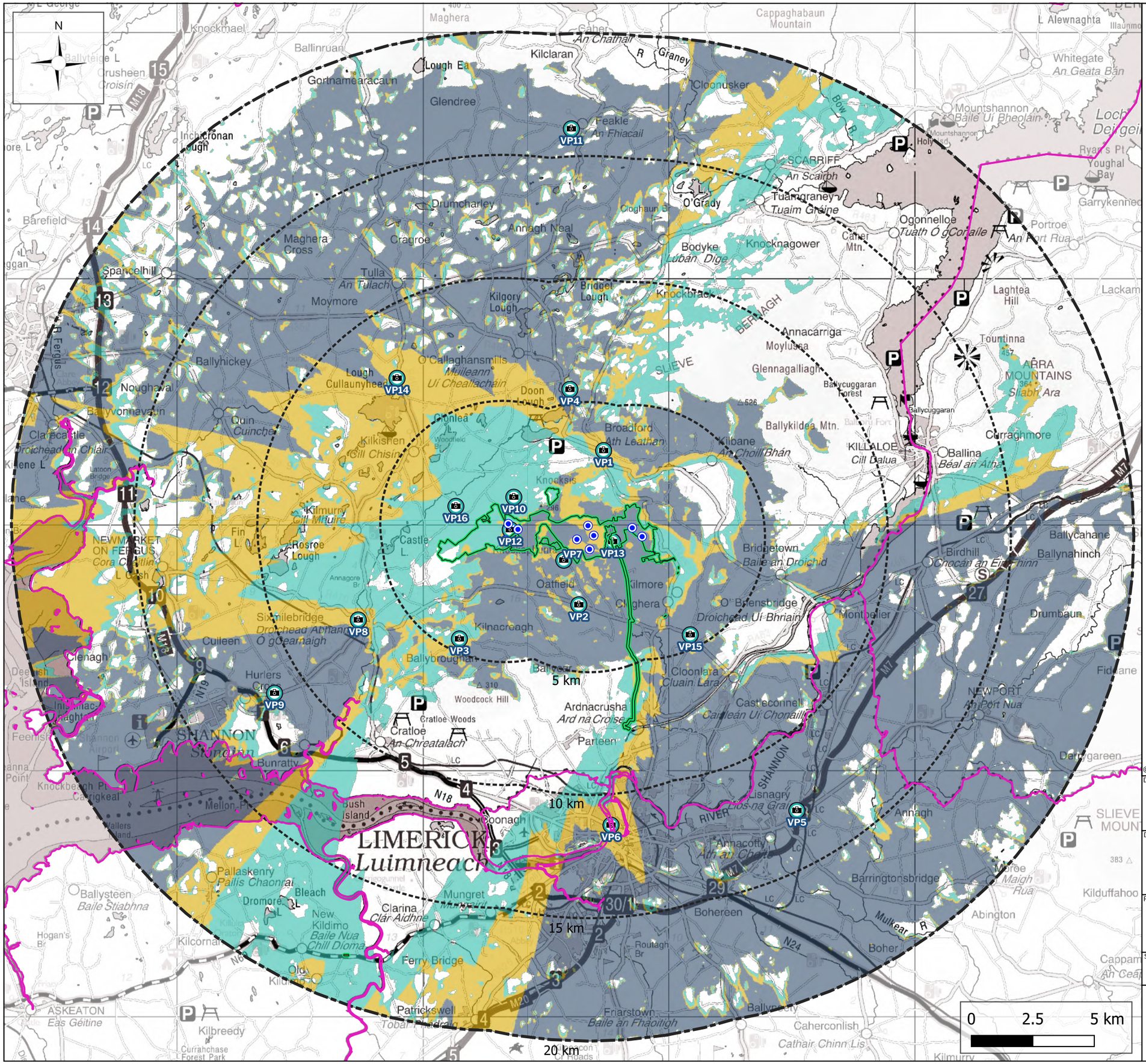
A Half-Blade ZTV is considered more appropriate and useful than a Full-Blade ZTV for analysing visibility of the proposed turbines and scoping receptors in and out for assessment, particularly when using an elevation model representing a bare earth scenario. As well as the guidance cited above, the decision to use a Half-Blade ZTV is based upon professional judgement and guided by the extensive experience the assessment team have ground truthing ZTVs against the reality of turbine visibility within landscapes where turbines already exist. As noted in Appendix 14-1, actual visibility on the ground is significantly less than predicted by the ZTV mapping due to intervening factors including on-site visual screening from natural and man-made features, atmospheric weather and/or localised topography.

Generation of the Half-Blade ZTV utilises large scale topographical data (interpolation across 10 m OSi contour data) and does not account for topographical variation of smaller scale (e.g. < 10m). Therefore, in reality, small, localised undulations in topography are likely to further inhibit visibility of the proposed turbines that may not be represented in the ZTV map. Other features of the landscape such as vegetation and man-made elements are also likely to obscure the proposed turbines from view from many areas where the Half-Blade ZTV indicates there is full visibility. In this regard, the ZTV Map is a useful tool to indicate where there is definitely no visibility of the proposed turbines, thus receptors located in these areas can be scoped out from further assessment.

14.3.2 Half-Blade ZTV of the Proposed Turbines

The Half-Blade ZTV map of the proposed turbines and LVIA Study Area is shown in Figure 14-1 below. The ZTV map is used within several mapping figures included in this chapter to enable assessment of theoretical visibility from landscape and visual receptors (see Appendix 14-4: *LVIA Baseline Map*, and Figure 14-1). Separate colour bands are used on each ZTV map to indicate the number of turbines of which the half blade will potentially be visible. The legend on each map shows the number of visible turbines for each corresponding colour, which are as follows:

- Yellow: 1–3 turbines theoretically visible;
- Teal: 3–6 turbines theoretically visible;
- Navy: 6–9 turbines theoretically visible.



Map Legend

- LVIA Study Area
- Proposed Turbines
- EIAR Site Boundary
- County Boundaries
- Photomontage Viewpoint Locations - Volume 2 Booklet

Half Blade Zone of Theoretical Visibility

- 1-3 Turbines Theoretically Visible
- 4-6 Turbines Theoretically Visible
- 7-9 Turbines Theoretically Visible

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Drawing No.

Figure 14-1

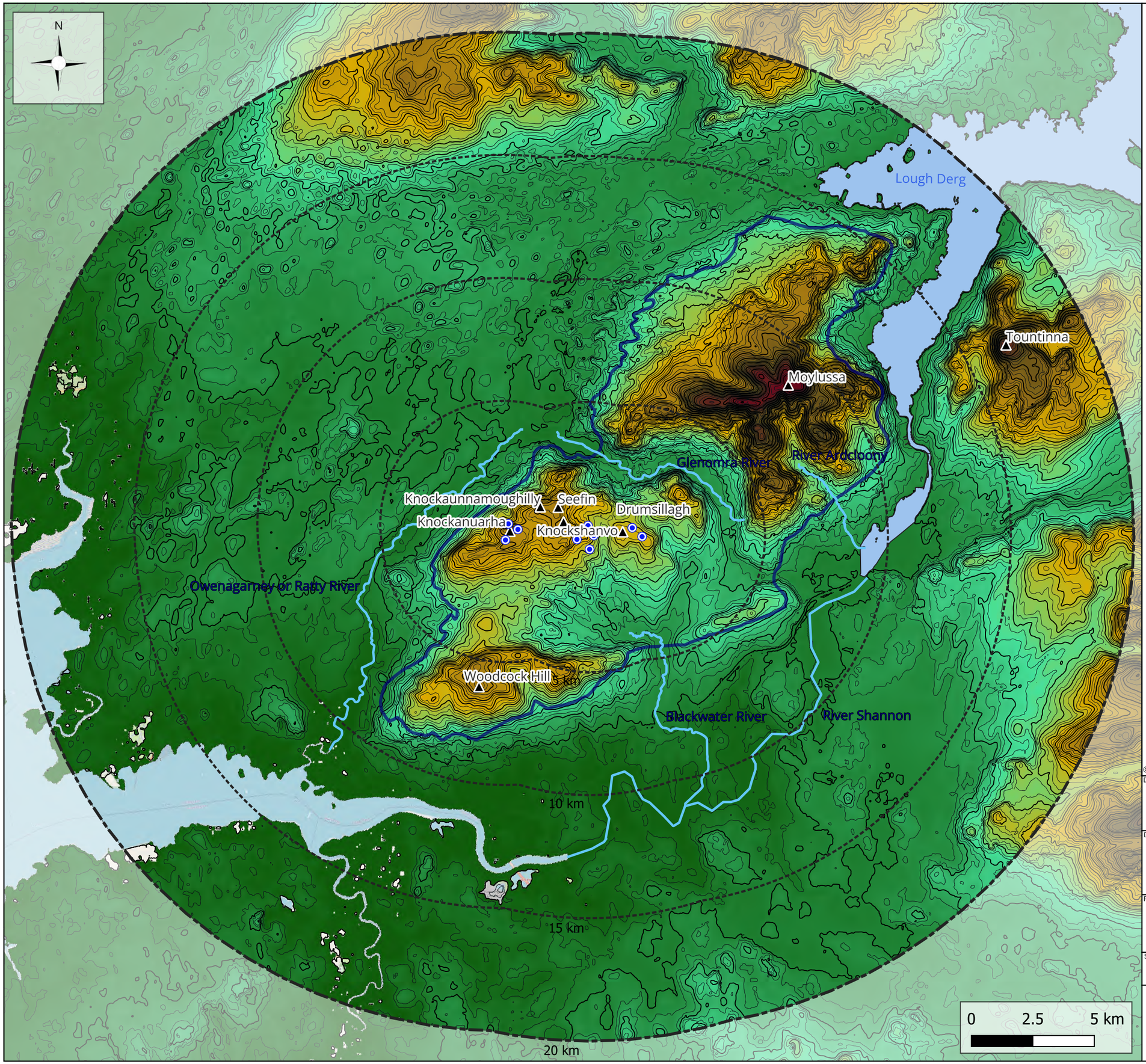
Drawing Title

Zone of Theoretical Visibility Map

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	18.07.2024	JW	JS



Map Legend

- LVIA Study Area
- Proposed Turbines

Elevation (AOD)

- 1 Metre
- 100 metres
- 200 metres
- 300 metres
- 400 metres
- 500 metres
- Contours - 30m Interval
- Contours - 10m Interval
- The Slieve Bernagh Uplands
- Elevated Peaks
- Prominent Watercourses
- Large Waterbodies

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Drawing No.

Figure 14-2

Drawing Title

Physical Landscape Features Map

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	30.04.2024	JW	JS

Figure 14-2 (above) shows the topographical features and elevation gradients existent within the receiving landscape of the LVIA Study Area; the geography of these topographical features defines the distribution of theoretical visibility illustrated in Figure 14-1.

The Wind Farm Site is located in an upland area of East Clare called the Slieve Bernagh Uplands. Mountainous upland terrain extends across the LVIA Study Area from the western banks of Lough Derg in the north-east, to Limerick City and the Shannon Estuary in the south and south-west. As shown in Figure 14-2, the Slieve Bernagh Uplands comprise three distinct landforms intersected by relatively narrow valleys. The Wind Farn Site is located in the central and western portions of the mountain range in and around a scattering of undulating peaks such as Knockanuarha, Knockaunnamoughilly, Seefin and Knockshanvo.

Description of Theoretical Visibility within 5km of the Proposed Turbines

As shown in the topographical features map above (Figure 14-2), the proposed turbines are sited along a linear ridgeline oriented east to west. This range of hills comprises an array of peaks of slightly irregular form and position. The ridgeline has a sharp descent on the northern slope and a more gradual descent towards its southern slope. Within 5km, full theoretical visibility of the proposed turbines mostly occurs within the small river valleys immediately south of the site.

One to three turbines of the Western Cluster are theoretically visible immediately west and north-west of the site within 5km, as illustrated by the green colour (teal) on the ZTV map. The steep and distinctive ridgelines linking peaks such as Knockanuarha and Knockaunnamoughilly serve to obscure visibility of turbines in the Central Cluster and Eastern Cluster from receptors within 5km to the west and north-west of the proposed turbines.

The Glenomra River follow a relatively steep sided and narrow valley from the town of Broadford to the north of the Wind Farm Site to the village of Bridgetown to the south-east of the site. Elevated landforms to the north and north-east of the site such as Knocksise (approx. 2.5km north of eastern cluster) and peaks in the townland of Fermoyle (approx. 2km east of eastern cluster) limit and restrict visibility of the proposed turbines from receptors at lower elevations within Glenmora Valley, as illustrated by areas of no theoretical visibility and areas of partial theoretical visibility, where the Western Cluster is unlikely to be seen.

No Theoretical Visibility of the Proposed Turbines in the North-East of the LVIA Study Area

The large landform of Slieve Bernagh includes the elevated peak of Moylussa (532m AOD) as well as Glenagalliagh Mountain are located across Glenomra Valley to the north-east and east of the Wind Farm Site. As shown by the ZTV map (Figure 14-1), these large landform features to the north-east obscure visibility of the proposed turbines in a large portion of the LVIA Study Area, as shown by the large area of no theoretical visibility around the landscape of Lough Derg and town of Killaloe.

Limited Theoretical Visibility of the Proposed Turbines in the South of the LVIA Study Area

A large linear landform is located approximately 5km south of the proposed turbines; it extends easterly from the village of Cratlow to an elevated peak at Woodcock Hill (320m AOD) and then a peak at Ballycarr South at its eastern extent. This large landform obscures visibility of the proposed turbines from a large area in the south of the LVIA Study Area; this is shown on the ZTV map as an area of no theoretical visibility at the north-western fringe of Limerick City and the start of the Shannon Estuary.

Theoretical Visibility of the Proposed Turbines in the North, West and South-West of the LVIA Study Area

The landscape immediately north and west of the Wind Farm Site abruptly transitions to a large flat plain of rolling drumlin farmland. The ZTV map indicates intermittent patches of theoretical visibility, of the Western and Central turbine clusters within 10km and then intermittent patches of full theoretical visibility of all proposed turbines to 20km in the north-westerly portion of the LVIA Study Area. As is discussed throughout this chapter, the weaving and undulating nature of the landforms in this area of the landscape greatly restricts long-ranging views of the proposed turbines, except from elevated vantage points, hence in this regard, the actual visibility of the proposed turbines is far less than is indicated by the ZTV map.

The ZTV map shows a corridor of full theoretical visibility of all proposed turbines in the south-west of the LVIA Study Area beyond the town of Sixmilebridge (approx. 7km from the nearest proposed turbine) around the town of Shannon and the Shannon Estuary.

Theoretical Visibility of the Proposed Turbines in the South-East of the LVIA Study Area

The physical landscape to the east and south-east of the LVIA Study is defined by the course of the Shannon River which flows south from Lough Derg, before flowing in a westerly direction through Limerick City to the Shannon Estuary and then to the Atlantic Ocean. The Shannon River (as well as one artificial canal which feeds the dam at Ardnacrusha) follows a wide river valley characterised by settled farmland and the urban sprawl of Limerick City and other settlements. The ZTV map shows widespread full theoretical visibility of all proposed turbines in this area of the landscape where there are no substantial topographical features to obscure visibility.

14.3.3 ZTV versus Actual Visibility

The ZTV map is a useful tool to indicate areas where there will be no visibility of the proposed turbines. Further, in practice, vast areas of the LVIA Study Area which have an indication of full theoretical visibility by the ZTV map (Figure 14-1) are likely to have no visibility of the proposed turbines due to other visual screening factors existent within the landscape.

Multiple field surveys were conducted during 2022 and 2023 to determine the actual likely visibility from locations where the ZTV has indicated full theoretical visibility. Surveys were conducted by Jack Smith and Jack Workman. These surveys determined that visual screening from localised undulations in topography, vegetation and man-made elements substantially reduce the likelihood of viewing the proposed turbines in vast areas of the LVIA Study Area.

14.3.3.1 Visibility in Close Proximity: Route Screening Analysis (RSA)

The road network surrounding the Wind Farn Site follows a network of weaving narrow valleys which navigate the upland terrain and the wider landscape comprises rolling agricultural land which include a network of trees and hedgerows. In order to gain a clearer understanding of the actual likely visibility of the proposed turbines, and to bridge the gap for the assessor between the computer-generated ZTV maps and the actual nature of visibility of the proposed turbines in proximity to the site, a Route Screening Analysis (RSA) was undertaken over several days in June 2023.

In order to comprehensively demonstrate the varying characteristics of the roads and to record the actual visibility in comparison to the theoretical visibility, a methodology was employed termed RSA; this was undertaken from all public roads within a 3.5km radius of the proposed turbines. The full methodology is outlined in Section 1.3.4 ‘Route Screening Analysis Methodology – Roads’ of Appendix 14-1: *LVIA Methodology* and the categories recorded were as follows:

- **Little/No Screening**: mainly open and with some very light vegetation (see below Plate 14-2);
- **Intermittent/Partial Screening**: light deciduous roadside vegetation and vegetation with short gaps allowing intermittent or partial views (see below Plate 14-3);
- **Full Screening**: vegetation, topography and built structure dense enough to block views, e.g. coniferous forestry (see below Plate 14-4).

The results of the route screening survey are mapped in Figure 14-3 below, this figure shows the extent to which each visual screening classification is present on all public roads within 3.5km of the proposed turbines. Where roads continued beyond 3.5km from the proposed turbines, the RSA survey continued to record the visual screening until reaching an appropriate termination point or junction.

Plate 14-2 Example of 'Little/No Screening' on the R471 Regional Road

Plate 14-3 Example of 'Intermittent/Partial Screening' on the L3046 Local Road

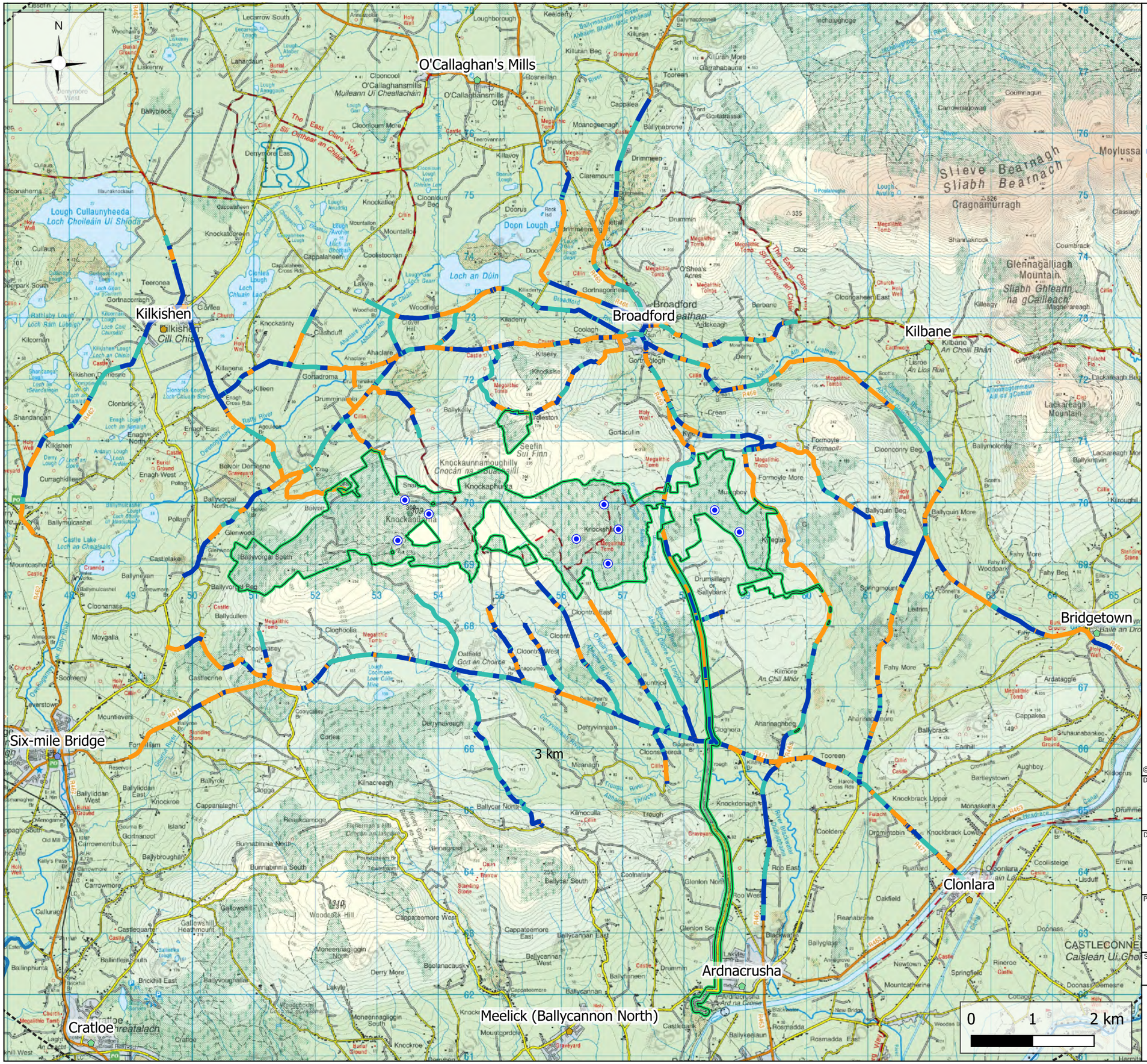
Plate 14-4 Example of 'Full Screening' in the Townland of Dromintobin

Table 14-1 below shows the distribution of roadside screening data recorded during the RSA which are illustrated in Figure 14-3 below.

Table 14-1 Distribution of Visual Screening Recorded during RSA

Screening Class	Length of Road Mapped in Figure 1-4	Percentage Distribution of Screening on the Surveyed Roads
Little/No Screening	32.31km	27.87%
Intermittent/Partial Screening	40.81km	35.21%
Full Screening	42.8km	36.92%

'Little/No Screening' was recorded for 27.87% of the surveyed roads and was the least common class recorded. 'Intermittent/Partial Screening' was recorded along 35.21% of the roads surveyed. The mosaic pattern of visual screening evident along most roads, as seen in Figure 14-3 below, suggests that there should be intermittent visibility along most of the roads, with visibility varying along all routes, offering glimpses and areas of open visibility, but which quickly transition into 'Intermittent/Partial Screening' or 'Full Screening' (36.92%). Given that there is at least some level of visual screening present along 72.13% ('Partial/Intermittent' and 'Full Screening' combined) of roads analysed, this suggests that the widespread theoretical visibility indicated on the ZTV in close proximity to the site is not fully representative of the actual on-the-ground visibility of the proposed turbines.



Map Legend

- Proposed Turbines
- EIAR Site Boundary

Route Screening Analysis

- No / Very Little Screening
- Partial / Intermittent Screening
- Dense / Full Screening

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Drawing No.

Figure 14-3

Drawing Title

Route Screening Analysis

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:60,000	200513	18.07.2024	JW	JS

An overview of the visual screening recorded during the RSA along prominent transport routes within 3.5km of the proposed turbines is discussed below.

R465 Regional Road

The R465 regional road is oriented north-south; it passes through the town of Broadford from the north and then provides a direct route to Limerick in the south. This road is the closest regional road to the Wind farm Site and passes withing a half a kilometre to the east of the nearest proposed turbine at its closest point. The RSA determined that 'Full Screening' occurs along most of the route that comes in very close proximity to the proposed turbines of the Eastern Cluster. A mix of visual screening classes ('Full Screening', 'Intermittent/Partial Screening' and 'Little/No Screening') were recorded elsewhere along this road.

R466 Regional Road (SR25 and SR26)

The R466 regional road encircles the Eastern Cluster from the north at Broadford village to the east and then south through Glenmora Valley to Bridgetown to the south-east. The road forms part of Co. Clare Designated Scenic Route (SR)-25 (north of Broadford) and then SR-26 (through Glenmora Valley). The RSA determined that there is generally a high amount of roadside screening in the direction of the proposed turbines upon this road within 3.5km of the proposed turbines. With regard to SR-26 there is no theoretical visibility shown by the ZTV in the areas where 'Little/No Screening' was recorded, particularly in the townland of Cloonyconroy Beg.

R471 Regional Road

The R471 regional road runs east to west approximately 2km south of all three turbine clusters. This section of road within the LVIA Study Area runs for an approximate 14.5km stretch linking the towns of Sixmilebridge and Cloonlara. This road is characterised as having a mixture of roadside screening classifications, including some large areas of 'Little/No Screening' immediately south of the Western and Central turbine clusters. Several local roads diverge to the north of the R471 along this section towards the Proposed Development, with a mixture of visual screening classes recorded.

14.3.3.2 Overview of RSA and Visibility Appraisals

The visibility appraisals conducted as part of the RSA determined that the widespread theoretical visibility indicated on the ZTV in very close proximity to the site is not fully representative of the actual on-the-ground visibility of the proposed turbines. Most road networks and settlements in the landscape in close proximity to the Wind Farm Site are generally located at lower elevations in the valley floors, and the land use in these areas is generally agricultural grazing pasture and mature vegetation along roads, thus field boundaries provide substantial visual screening within the landscape. Site visits determined that this is also the case for the wider landscape of the LVIA Study Area, where above-ground screening from localised topography, mature vegetation and the built environment substantially reduce the visual exposure of the proposed turbines compared with what is indicated by the ZTV.

14.4 Landscape Baseline

The Landscape Baseline reports relevant policy pertinent to the LVIA, as well as a description of the receiving landscape of the Proposed Development Site and its wider setting. This is broken down into the following sections:

- **Landscape Designations and Policy Context** – Policy setting pertaining to the location and nature of the Site from a landscape perspective based on:

- Clare County Development Plan 2023–2029 (CCDP);
- Tipperary County Development Plan 2022–2028 (TCDP);
- Limerick Development Plan 2022–2028 (LDP);

- **Landscape Character of the Wind Farm Site** – A description of the physical landscape and characteristics of the Site and its immediate landscape setting, including the following considerations:
  - Landscape characteristics based upon findings from site visits conducted in 2023 by Jack Smith and Jack Workman in September 2022; June 2023; August 2023;
  - An appraisal of landscape value and the susceptibility of the landscape to change, and a determination of landscape sensitivity;
- **Landscape Characterisation in the Wind Energy Development Guidelines for Planning Authorities** – A review of the WEDGs and Draft Revised WEDGs (DoEHLG, 2006; DoHPLG, 2019) and siting guidance relating to the landscape characteristics of the Site;
- **Landscape Character of the Wider Landscape Setting (LCAs)** – A description of the wider landscape setting including the identification of designated LCAs located within 15km of the proposed turbines and a preliminary analysis using ZTV mapping.

14.4.1 Landscape Designations and Policy Context

This section reviews the policies and objectives of various planning policy documents relating to landscape, planning and the locational siting of wind farms, as they relate to the Proposed Development.

The proposed Wind Farm Site is located in Co. Clare, therefore, the Clare County Development Plan 2023–2029 (hereafter, CCDP) was consulted to identify relevant landscape and visual policy and objectives relating to the development of a wind farm in Co. Clare. This development plan forms the primary policy document considered in identifying designations such as protected landscapes, protected scenic amenity and designated LCAs in the LVIA Study Area.

The proposed underground Grid Connection extends south from the Wind Farm Site to Ardnacrusha in Co. Limerick. The proposed transition area is also located in Co. Limerick. In addition, as demonstrated by ZTV mapping (see Figure 14-1 previously), the LVIA Study Area encompasses portions of Co. Limerick as well as Co. Tipperary with theoretical visibility of the proposed turbines. Consequently, the county development plans of Tipperary and Limerick were also consulted to identify relevant landscape designations within the LVIA Study Area (see Section 14.4.1.2 'Landscape Designations in Other Counties: Co. Limerick and Co. Tipperary').

14.4.1.1 Clare County Development Plan 2023–2029 (CCDP)

The CCDP was adopted by the Elected Members of Clare County Council at a Special Planning Meeting on the 9th of March 2023; it then came into effect on 20th of April 2023. This section reports relevant policy and objectives in the CCDP relating to the development of wind energy in Co. Clare and policy relating to likely effects on landscape and visual amenity.

Section 11.8.5 of the CCDP sets out objectives and policy in relation to renewable energy resources in Co. Clare. Item C of the Development Plan Objective CDP11.47 relates specifically to the development of wind energy, stating:

> *'**CDP11.47** It is an objective of Clare County Council:*
>
> *a) To encourage and to favourably consider proposals for renewable energy developments, including community owned developments, and ancillary facilities in order to meet National,*

Regional and County renewable energy targets, and to facilitate a reduction in CO_2 emissions and the promotion of a low carbon economy;

b) To assess future renewable energy-related development proposals having regard to the Clare Renewable Energy Strategy 2023-2030 in Volume 5 of this plan and associated SEA and AA;

c) To support the sustainable development of renewable wind energy (on-shore and offshore) at appropriate locations and of its related grid infrastructure in County Clare, in accordance with all relevant policies, guidance and guidelines pertaining to the protection of the environment and protected habitats and species, and to assess proposals having regard to the Clare Wind Energy Strategy in Volume 6 of this plan and the associated SEA and AA, or any subsequent updated adopted Strategy and to national Wind Energy Guidelines;

d) To prepare a new and updated Wind Energy Strategy for County Clare during the lifetime of this plan, subject to the publication of the update to the Wind Energy Development Guidelines for Planning Authorities 2006;

e) To strike an appropriate balance between facilitating renewable and wind energy-related development and protecting the residential amenities of neighbouring properties;

f) To support and facilitate the development of new options and technological advances in relation to renewable energy production and storage, that may emerge over the lifetime of this Plan'.

As noted in Item C, assessment of proposals for wind energy developments such as the Proposed Development will be assessed against and have regard to the Clare Wind Energy Strategy (hereafter, CWES).

14.4.1.1.1 The Clare Wind Energy Strategy (CWES) – Volume 6 of the CCDP

The CWES forms Volume 6 of the CCDP. The CCDP describes the CWES as follows:

'This volume comprises a detailed countywide Wind Energy Strategy, supplemented by maps which set out Clare County Council's strategy for informing wind energy development, having regard to economic, environmental and visual issues'.

Chapter 4 of the CWES is called 'Advice on Landscape Capacity for Wind Energy Developments based on Landscape Character Areas'. In this section, the CWES identifies and designates different areas of the landscape of Co. Clare into 4 No. classifications relating to their suitability for wind energy development. The 'Wind Energy Designations' map from Chapter 4 of the CWES is reproduced below in Figure 14-4, with the location of the Wind Farm Site highlighted by a red annotation, and the four wind energy designations as follows:

- 'Strategic Areas' (purple on the map below);
- 'Acceptable in Principle' (dark green);
- 'Open to Consideration' (light green);
- 'Not Normally Permissible' (orange).

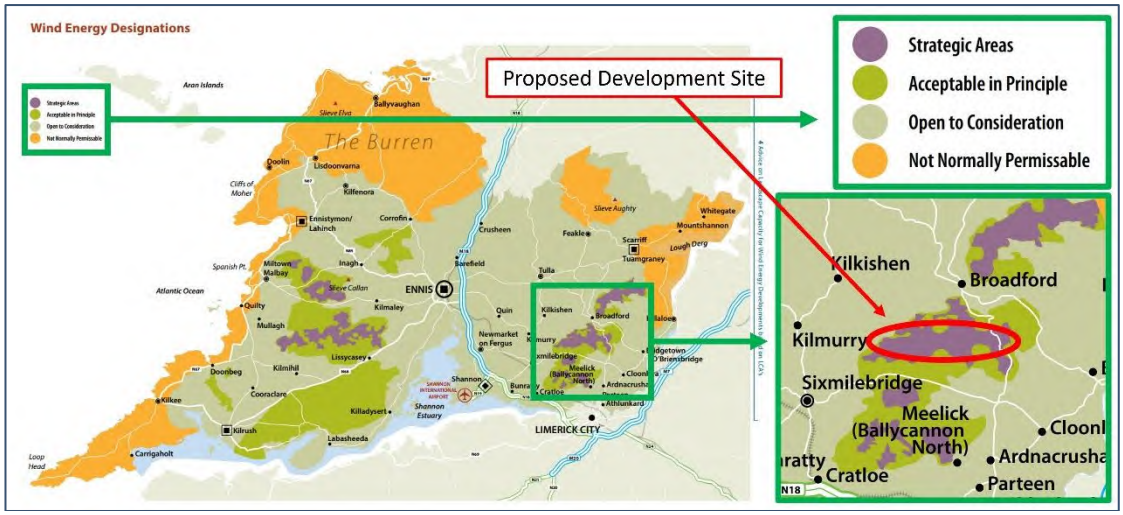


Figure 14-4 Wind Energy Designations Map from Section 4 of the CWES; Location of the Proposed Development is Identified by Red Annotation

Landscape and Visual Considerations in the CWES

Section 2.5.3 of the CWES reports that potential for Landscape and Visual Impacts have been a key strategic consideration informing the development of the wind energy strategy and spatial designations in the CWES. For example, the areas of Co. Clare designated as 'Not Normally Permissible' are essentially considered 'no go' areas for wind energy development, and the spatial extent of these designations generally overlaps and mirrors areas of Co. Clare 'Heritage Landscape'. Co. Clare Heritage Landscapes are the most vulnerable, sensitive and protected landscape designations in the county, including unique protected landscapes such as The Burren, the Cliffs of Moher, the Atlantic coastal corridor and the eastern banks of Lough Derg (Co. Clare Heritage landscapes are discussed in more detail in Section 14.4.1.1.3 below).

Section 2.5.3 of the CWES reports that the wind energy designations were informed by analysis of other designations (as well as 'Heritage' landscapes) such as designated Scenic Routes and designated LCAs, stating:

> *'In addition, the Landscape Character Assessment of County Clare was used as a baseline to assess capacity for areas to accommodate wind farm developments'.*

The Landscape Character Assessment of County Clare (LCACC) was published in 2004 and is addressed and considered in this LVIA (see below Section 14.4.1.1.2 'Clare County Landscape Character Assessment'); however, it is noted that the CWES includes a more recent appraisal of LCAs than the LCACC and addresses the sensitivity and capacity of designated LCAs with specific consideration of wind energy development. LCAs are of primary consideration in Chapter 4 of the CWES, in that the chapter provides zoning maps for wind energy designations and *Table 4a* which addresses each LCA in Co. Clare and provides 'Strategic Guidance on Landscape Capacity for Wind Energy Developments'. The LCAs of the county and the guidance in *Table 4a* of CWES are reported below.

Potential for effects on landscape and visual amenity have been a key strategic consideration in the spatial zoning of wind energy designations in Co. Clare. It is therefore reasoned that the CWES as a local planning policy document envisions turbines to be seen within the 'Strategic Area' and 'Acceptable in Principle' landscapes where wind energy development has been specifically directed and promoted.

Spatial Wind Energy Designations in the CWES and the Proposed Development

The wind energy designation map above includes the entire landscape of Co. Clare. A relatively small portion of the landscape comprises 'Strategic Areas', only approximately 2.9% of the entire county, indicating that these areas are generally the most suitable area of the landscape capable of accommodating and absorbing wind energy development. The CWES does not rule out development of wind energy in other designated areas such as 'Acceptable in Principle' and 'Open to Consideration'.

Initial selection of the Wind Farm Site was plan-led, with the zoning in the CWES being an integral part of the site selection process. The Wind Farm Site is predominantly sited in a 'Strategic Area', as illustrated by Figure 14-5 below. Eight of the 9 No. proposed turbines and a majority of the other proposed infrastructure of the development have been strategically sited within this 'Strategic Area' landscape. All turbines are sited in areas of the landscape where it is both acceptable and envisioned to view turbines.

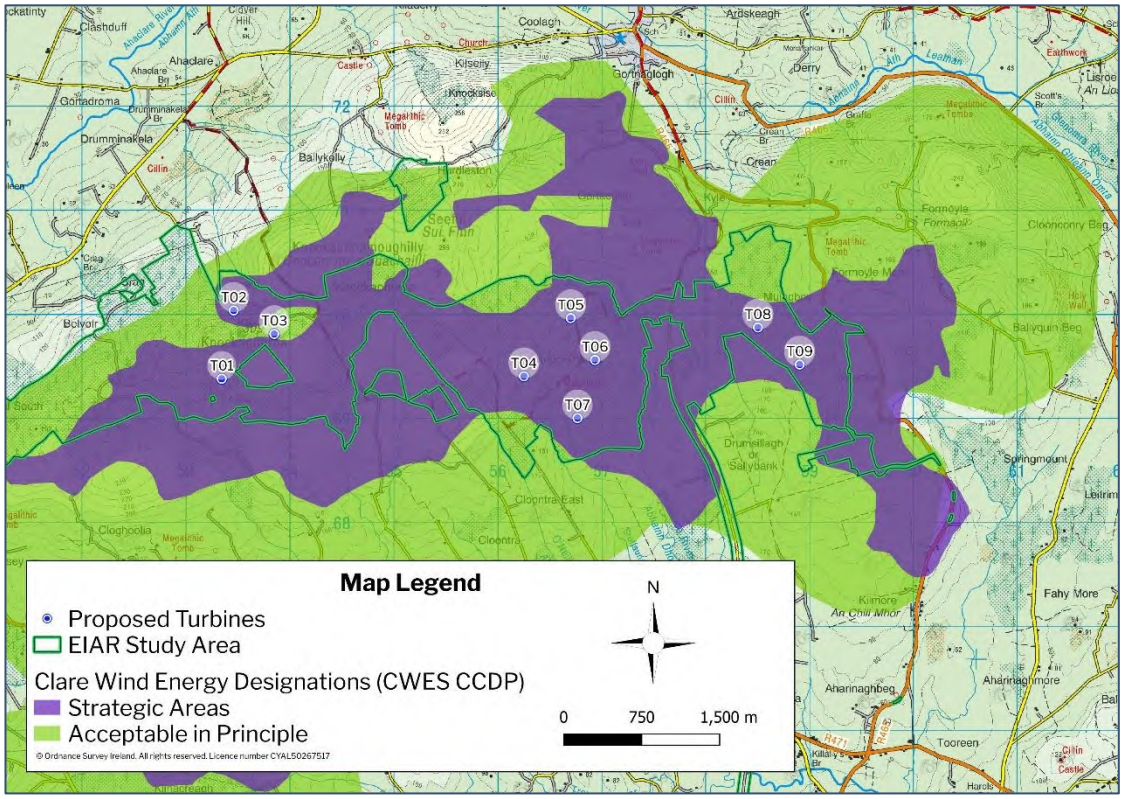


Figure 14-5 Proposed Turbines and EIAR Study Area relative to Wind Energy Designations

As shown by the map above, the proposed turbines do not comprise the entirety of the 'Strategic Area' landscape. As stated previously in Section 14.1.3 'Mitigation by Design', through the iterative EIAR design process with consideration of potential effects on the landscape and visual receptors (as well as other environmental constraints included in the EIAR) the turbine layout was substantially reduced from, 18 No. turbines to the 9 No. turbines currently proposed. Many turbines were removed from the Proposed Development in order to eliminate or mitigate effects on environmental sensitivities, including landscape and visual amenities. Therefore, a large portion of this 'Strategic Area' shown above does not comprise proposed turbines. The number of proposed turbines was reduced by half from 18 to 9, as is shown by the earlier iterations of the turbine layout for this project presented in Chapter 3. As is evident throughout this chapter of the EIAR and illustrated by the photomontages, the large-scale 'Strategic Area' landscape of the Wind Farm Site can effectively absorb the 9 No. proposed turbines. The proposed turbine layout is the subject of substantial analysis and micro-siting and has been informed by many other constraints besides those of landscape and visual. This includes turbine T3 in all aspects, except that this turbine is the 1 out of 9 No. turbines not located within the bounds of the 'Strategic Area'.

A Suitable Landscape for Turbine T3

As shown in the map above, turbine T3 of the Western Cluster is the only turbine of the Proposed Development sited in an area designated as 'Acceptable in Principle'. As shown in both the map above (Figure 14-5) and below (Figure 14-6, which enlarges the view of the Western Cluster), T3 is completely encircled to the north (approx. 130m), east (appro. 400m) and south (approx. 40m) by lands zoned as 'Strategic Area' for wind energy development. Analysis of the mapping process and constraints identified in the CWES which informed the wind energy zoning give no clear indication for the difference in zoning existent around T3.

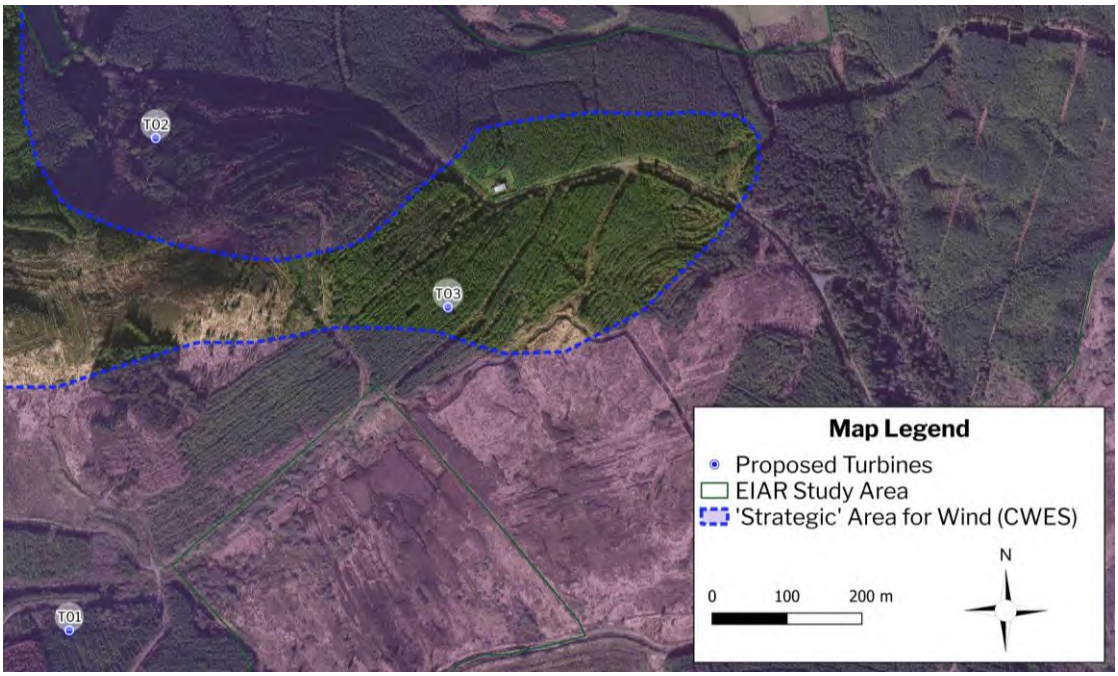


Figure 14-6 Aerial Map of the Western Cluster; Turbine T3 is encircled by Designated 'Strategic Area' for Wind Energy Development

Multiple site visits during assessments for this chapter of the EIAR and early-stage feasibility studies, including a landscape capacity assessment, evaluated the border of this peculiar piece of zoning. As shown from the aerial map above, T3 and the area zoned as 'Acceptable in Principle' is located in an active area of commercial forestry. This loop around T3 comprises privately owned land and holds no discernible landscape characteristics or sensitivities warranting a change in zoning from a landscape and visual perspective. No other environmental constraints, either identified from the CWES or through the course of the EIAR, could indicate the cause of this irregular zoning shape. The siting of this single turbine in an area enclosed by 'Strategic Area' lands has no real bearing on the visual impact of a wind farm in terms of the character and aesthetic of the wider landscape setting.

It is noted that the peak of Knockanuarha, as well as the walking trail to this peak called the 12 O'Clock Hills Walking Route, are located approximately 320m west of T3. This peak and walking trail are also relatively enclosed by areas designated as 'Strategic Areas'; these amenity resources are comprehensively addressed and assessed below in Section 14.7.3.3.3 'Discussion of Visibility and Visual Effects on Specific Visual Receptors in the LVIA Study Area'.

Landscape Character Areas (LCAs) from the CWES

Table 4a in Section 4 of the CWES reports the general landscape capacity for wind energy developments across the county's different Landscape Character Areas (LCAs). The LCAs in the LVIA Study Area are described further below in Section 14.4.1.1.2 'Clare County Landscape Character Assessment', and all proposed Knockshanvo turbines, as well as the Wind Farm Site, are located in LCA 8 – *Sliabh Bernagh Uplands. Table 4a* is reproduced below.

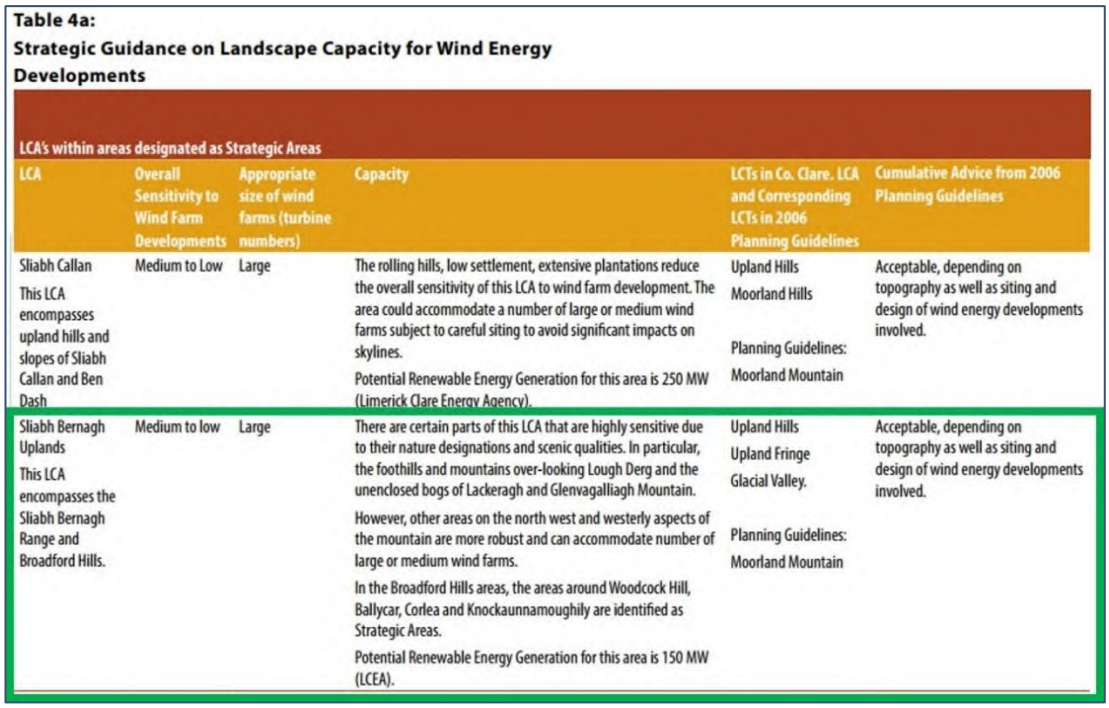


Table 4a:
Strategic Guidance on Landscape Capacity for Wind Energy Developments

LCA's within areas designated as Strategic Areas					
LCA	Overall Sensitivity to Wind Farm Developments	Appropriate size of wind farms (turbine numbers)	Capacity	LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	Cumulative Advice from 2006 Planning Guidelines
Sliabh Callan This LCA encompasses upland hills and slopes of Sliabh Callan and Ben Dash	Medium to Low	Large	The rolling hills, low settlement, extensive plantations reduce the overall sensitivity of this LCA to wind farm development. The area could accommodate a number of large or medium wind farms subject to careful siting to avoid significant impacts on skylines. Potential Renewable Energy Generation for this area is 250 MW (Limerick Clare Energy Agency).	Upland Hills Moorland Hills Planning Guidelines: Moorland Mountain	Acceptable, depending on topography as well as siting and design of wind energy developments involved.
Sliabh Bernagh Uplands This LCA encompasses the Sliabh Bernagh Range and Broadford Hills.	Medium to low	Large	There are certain parts of this LCA that are highly sensitive due to their nature designations and scenic qualities. In particular, the foothills and mountains over-looking Lough Derg and the unenclosed bogs of Lackeragh and Glenvagalliagh Mountain. However, other areas on the north west and westerly aspects of the mountain are more robust and can accommodate number of large or medium wind farms. In the Broadford Hills areas, the areas around Woodcock Hill, Ballycar, Corlea and Knockaunnamoughily are identified as Strategic Areas. Potential Renewable Energy Generation for this area is 150 MW (LCEA).	Upland Hills Upland Fringe Glacial Valley. Planning Guidelines: Moorland Mountain	Acceptable, depending on topography as well as siting and design of wind energy developments involved.

Figure 14-7 Reproduction of Table 4a from Section 4 of the CWES: 'Landscape Capacity of the Slieve Bernagh Uplands LCA to Wind Energy Development'

The text from *Table 4a* of the CWES relating to the landscape capacity of LCA 8 – *Sliabh Bernagh Uplands* is reported in the following table:

Table 14-2 Landscape Capacity of Co. Clare LCA 8 – Slieve Bernagh Uplands, as reported in Table 4a of the CWES

Criteria in CWES	Description for LCA 8 – Slieve Bernagh Uplands
Overall Sensitivity to Wind Farm Development	*'Medium to Low'*
Appropriate Size of Wind Farms	*'Large'*
LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	*'There are certain parts of this LCA that are highly sensitive due to their nature designations and scenic qualities. In particular, the foothills and mountains over-looking Lough Derg and the unenclosed bogs of Lackeragh and Glenvagalliagh Mountain. However, other areas on the north west and westerly aspects of the mountain are more robust and can accommodate number of large or medium wind farms. In the Broadford Hills areas, the areas around Woodcock Hill, Ballycar, Corlea and Knockaunnamoughily are identified as Strategic Areas. Potential Renewable Energy Generation for this area is 150 MW (LCEA)'.*
LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	*'Upland Hills; Upland Fringe; Glacial Valley.* *Planning Guidelines: Moorland Mountain'.*

Cumulative Advice from 2006 Planning Guidelines	*'Acceptable, depending on topography as well as siting and design of wind energy developments involved'.*

The 'Overall sensitivity to Wind Farm Development' of LCA 8 – *Slieve Bernagh Uplands* is given a rating of 'Medium to Low', which is the lowest sensitivity designation/category by the CWES attributable to LCAs in Co. Clare. Considering the local planning policy designations, this LCA is deemed to be of 'Low' sensitivity and capable of absorbing wind energy such as the Proposed Development.

Table 4a of the CWES also determines that the 'appropriate size of wind farms (turbine numbers)' in this LCA is rated as 'Large'. Section 1.4 of the CWES defines 'Large' as wind farms numbering 11 to 25 turbines and 'Medium' as wind farms numbering 6 to 10 turbines. In this regard, it is considered that the 9 No. proposed turbines are of a medium size, thus it is a development with the potential to be effectively absorbed by this LCA.

14.4.1.1.2 Clare County Landscape Character Assessment

Chapter 14 of the CCDP promotes alignment with the National Landscape Strategy for Ireland 2015–2025. However, in the absence of a National Landscape Character Assessment, the CCDP recommends the use of '*Clare County Landscape Character Assessment in both the preparation and assessment of planning applications*'. As reported in *Chapter 14.2.1* of the CCDP, the character, value, and sensitivity of different designated landscape areas within Co. Clare must refer to 'The Landscape Character Assessment of County Clare' published in 2004 (hereafter, the LCACC).

> *'**CDP14.1:** It is an objective of Clare County Council:*
>
> *a) To encourage the utilisation of the Landscape Character Assessment of County Clare, the forthcoming Regional Landscape Strategy and other relevant landscape policy and guidelines and to have regard to them in the facilitation, protection and management of appropriate landscape change in County Clare'.*

The LCACC designates areas of Co. Clare with two landscape classification scales:

- Landscape Character Types – *'Distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different localities throughout the County. Nonetheless, where they do occur, they commonly share similar combinations of geology, topography, land cover and historical land use'.*
- Landscape Character Areas (LCAs) – *'Units of the landscape that are geographically specific and have their own character and sense of place. Each LCA has its own distinctive character, based upon patterns of geology, landform, land use, cultural, historical and ecological features'.*

The Proposed Development is located in the 'Upland Hills' Landscape Character Type, described as follows in the LCACC:

> *'These upland hills are found predominantly in the north and east of the county, in Sliabh Bernagh and Sliabh Aughty. They are composed of rolling upland hills with core areas above 200m and rising to 526m at the highest point. Occasional small loughs are present (e.g. Lough Atorick) and small streams drain the open slopes. Land cover is largely blanket bog, however this has been modified through coniferous planting in recent times. Consequently, a mosaic of land cover is more dominant currently, with open areas of heather, gorse, blanket bog and rough grasses accompanied by forestry. There is very little natural woodland, and where it exists it is confined to valleys and the lower slopes. These upland hills are often open, reflecting commonage regimes, however where enclosures exist they are increasingly post and*

wire with drainage ditches. Occasional older enclosures can be seen, composed of low stone walls in poor condition. Very little settlement and roads, confined to fringes, apart from forestry access roads. From these upland hills, extensive views are afforded across and towards surrounding landscapes'.

As determined by site investigations, the character of the Wind Farm Site aligns with this description of the 'Upland Hills' Landscape Character Type. As detailed below in Section 14.4.2 'Landscape Character of the Site', the Wind Farm Site is generally considered to be rolling upland hills modified through coniferous planting.

The LCACC identifies 21 distinct LCAs. As reported in the previous section, the Proposed Development is predominantly sited in LCA 8 – *Slieve Bernagh Uplands* (with the proposed underground Grid Connection to traverse other LCAs), given the following 'key characteristics':

- *'Area of gentle and rolling hills reaching 530m at Sliabh Bernagh;*
- *Settlement is scattered, confined to lower fringes;*
- *Hedgerows create a wooded feel and are often planted with fuchsia around dwellings;*
- *Historically little settlement other than ritual, as evidenced by a number of cairns, barrows and standing stones identified on the eastern slopes. Broadford Gap is an important Bronze Age passing route;*
- *Remote and isolated with panoramic views afforded to Lough Derg, lower drumlin farmland and Shannon estuary;*
- *Vegetation dominated by heather moorland with plantation forests and semi-natural deciduous woodland on lower slopes and along water courses'.*

The section on landscape condition and sensitivity in the LCACC reports the landscape sensitivity of LCA 8 – *Slieve Bernagh Uplands*. Based on this, the classification of landscape value and landscape sensitivity from the LCACC may result in a 'Medium' landscape sensitivity for this LCA in this LVIA. However, since the LCACC was published in 2004, the CWES has been published and the designation of this LCA as a 'Strategic Area' for wind energy development takes precedence over the 2004 sensitivity classifications in the LCACC. As detailed above in Table 14-2, the CWES designates this LCA as having a 'Medium to Low' sensitivity to wind farm development, with 'Large' wind farms (11–25 turbines) being of appropriate size.

Ten other Co. Clare LCAs are identified within the 15km LCA Study Area for assessment of effects on designated LCAs:

- LCA-5 Slieve Aughty Uplands;
- LCA-6 Lough Graney;
- LCA-7 Lough Derg Basin;
- LCA-9 River Shannon Farmland;
- LCA-10 Sixmilebridge Farmland;
- LCA-11 East Clare Loughlands;
- LCA-12 Tulla Drumlin Farmland;
- LCA-13 Ennis Drumlin Farmland;
- LCA-14 Fergus Estuary.

These LCAs are mapped and further addressed below in Section 14.4.4: 'Landscape Character of the Wider Landscape Setting'. In that section, all designated LCAs are analysed using ZTV mapping to scope them in or out of assessment. All LCAs scoped in during the preliminary analysis are comprehensively assessed in Appendix 14-2: *LCA Assessment Tables.*

14.4.1.1.3 Co. Clare Living Landscapes

In *Chapter 14* of the CCDP, it is listed that one strategic aim is to:

> *'...implement the 'Clare's Living Landscapes' approach to landscape management and enhancement throughout the County'.*

The CCDP identifies three types of 'Living Landscape', as follows:

- *'Settled Landscapes – areas where people live and work;*
- *Working Landscapes – intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource;*
- *Heritage Landscapes – areas where natural and cultural heritage are given priority and where development is not precluded but happens more slowly and carefully'.*

Co. Clare applies different objectives and protections to each Living Landscape designation. 'Heritage' landscape areas are considered the most sensitive landscapes, while 'Settled' and 'Working' landscapes are of lower sensitivity.

The Wind Farm Site is located in 'Settled' landscape. Development in these Settled areas is guided by the development plan Objective CPD14.2, which is a general policy relating to sustainable development. The three living landscape designations cover the entirety of Co. Clare, comprising a total area of approximately 3,450 km^2. 'Settled' landscape comprises approximately 51.6% (1782 km^2) of the entirety of Co. Clare, therefore this policy pertains to a large area and is very general in nature. Item C in Objective CDP11.47 of the CCDP cites that it is an objective of the plan to assess wind energy proposals with regard to the CWES. The CWES designates only 2.9% of Co. Clare as 'Strategic Areas' for wind energy development. Considering the trade-off in a spatial context between the clear and specific designations of the CWES (and Objective CDP11.47) and the very general policy objective of CDP14.2, the limited amount (2.9% of Co. Clare) of viable areas reserved as 'Strategic' must take precedence over policy designations and objectives for 'Settled' landscape which comprises a vast area (51.6% of Co. Clare).

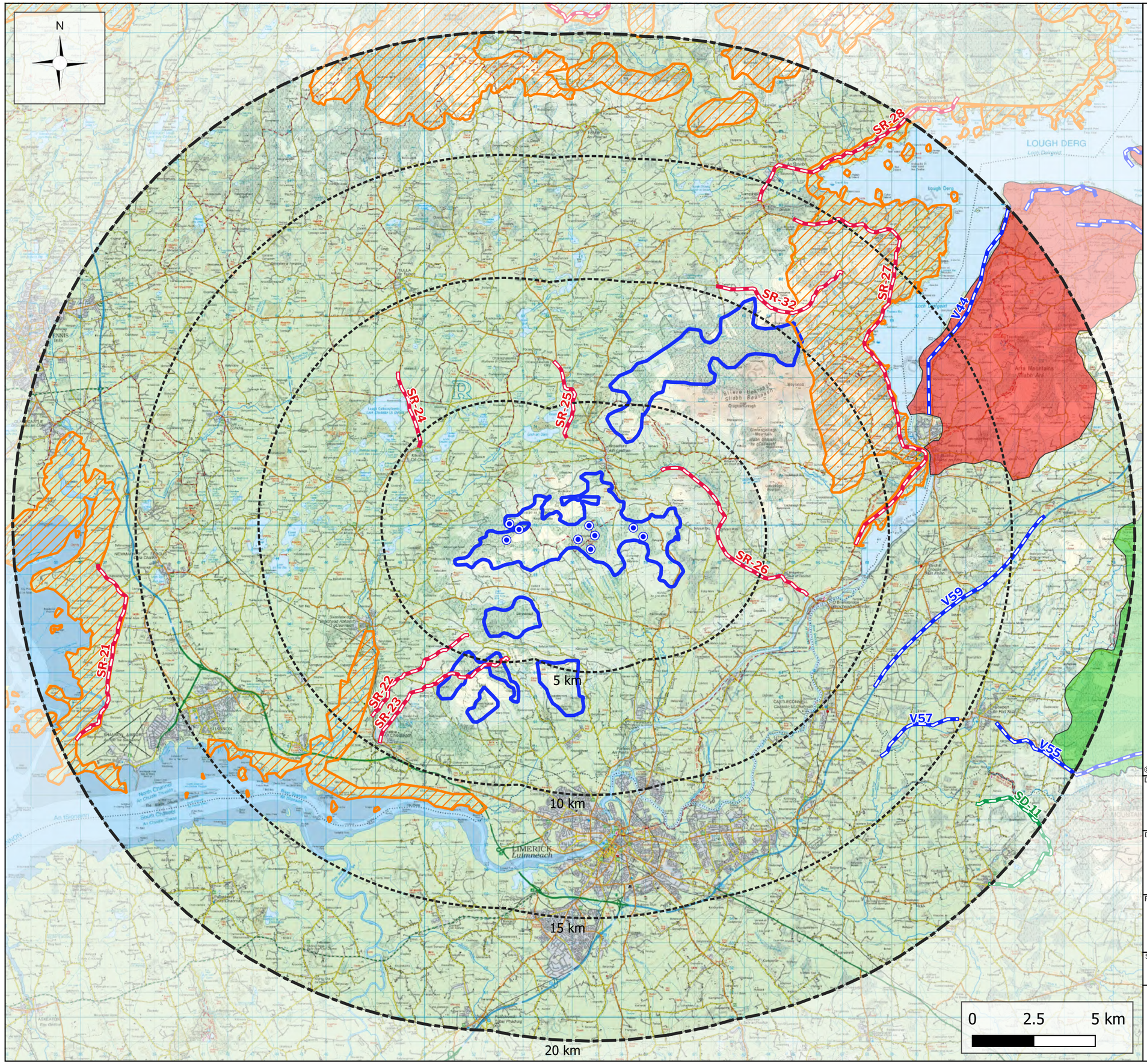
Co. Clare 'Heritage' landscape is the most sensitive of the Living Landscape designations, comprising sensitive landscape areas such as The Burren and Lough Derg, as well as coastal areas such as the Atlantic coastal corridor and the Shannon Estuary. Development proposals within and in close proximity to these landscapes must be highly cognisant of potential visual impacts under the Objective CDP14.2. In relation to wind energy development, the Co. Clare 'Heritage' landscapes generally mirror the 'Not Normally Permissible' areas designated in the CWES. Areas of Co. Clare 'Heritage' landscapes in the LVIA Study Area are mapped in Figure 14-8 below and include areas around Lough Derg and the Shannon Estuary. The impact of the Proposed Development upon these receptors are assessed later in this chapter. All policies relating to Living Landscapes place some form of protection with regards to intrusion upon designated Scenic Routes.

14.4.1.1.4 Protected Views and Prospects – Co. Clare Designated Scenic Routes

Section 14.5 of the CCDP relates to protected views and prospects through the designation of Scenic Routes as follows:

> *'There is a need to protect and conserve views adjoining public roads throughout the County where these views are of high amenity value. In conserving views, it is not proposed that this should give rise to the prohibition of development along these routes but development, where permitted, should not seriously hinder or obstruct these views and should be designed and located to minimise their visual impact'.*

Designated Scenic Routes are mapped in the CCDP in Volume 2 (Map C), Map 14A and Appendix 5 of that plan; those that exist in the LVIA Study Area have been mapped below in Figure 14-8.



Map Legend

- LVIA Study Area
- Proposed Turbines

Co. Clare Landscape Designations CCDP 2023-229

- Clare Designated Scenic Routes
- Clare Heritage Landscape
- 'Strategic Area' for Wind (CWES)

Co. Tipperary Landscape Designations TCDP 2022-2028

- Tipperarey Scenic Routes

Tipperary Landscape Amenity Areas

- Primary Amenity Area
- Secondary Amenity Area

Co. Limerick Landscape Designations LDP 2022-2028

- Limerick Views and Prospects

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Drawing No.

Figure 14-8

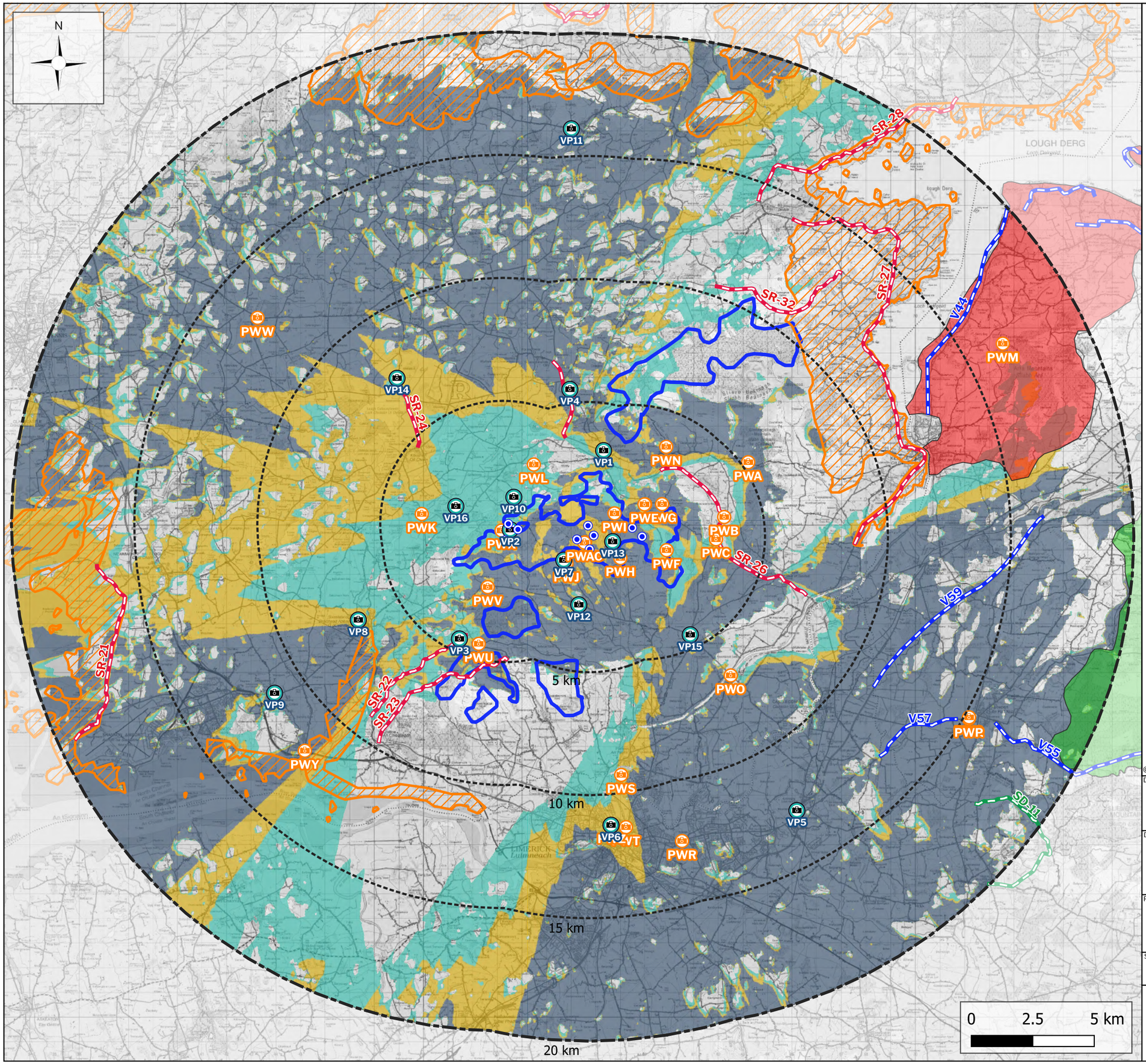
Drawing Title

Landscape Policy Context

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	06.11.2023	JW	JS



Map Legend

- LVIA Study Area
- Proposed Turbines

Half Blade Zone of Theoretical Visibility

- 1-3 Turbines Theoretically Visible
- 4-6 Turbines Theoretically Visible
- 7-9 Turbines Theoretically Visible
- Photomontage Viewpoint Locations Volume 2 Booklet
- Photowire Viewpoint Locations Appendix 14-5

Co. Clare Landscape Designations CCDP 2023-229

- Clare Designated Scenic Routes
- Clare Heritage Landscape
- 'Strategic Area' for Wind (CWES)

Co. Tipperary Landscape Designations TCDP 2022-2028

- Tipperarey Scenic Routes

Tipperary Landscape Amenity Areas

- Primary Amenity Area
- Secondary Amenity Area

Co. Limerick Landscape Designations LDP 2022-2028

- Limerick Views and Prospects

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Drawing No.

Figure 14-9

Drawing Title

ZTV & Landscape Policy Context

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	06.11.2023	JW	JS

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The CCDP has the following objective in relation to designated Scenic Routes:

> *'**CPD14.7:** It is an objective of Clare County Council:*
>
> *a) To protect sensitive areas from inappropriate development while providing for development and change that will benefit the rural community;*
>
> *b) To ensure that proposed developments take into consideration their effects on views from the public road towards scenic features or areas and are designed and located to minimise their impact; and*
>
> *c) To ensure that appropriate standards of location, siting, design, finishing and landscaping are achieved'.*

As shown in Figure 14-8, 9 No. Co. Clare designated Scenic Routes were identified in the LVIA Study Area. They are listed in Table 14-3 below and described as per Appendix 5: 'Scenic Routes' of the CCDP.

Table 14-3 Designated Co. Clare Scenic Routes in the LVIA Study Area

Number	Scenic Routes – Location (Appendix 5 of the CCDP)
C-SR-21	Road through Ballysallagh east, southwards to Ballycally.
C-SR-22	From Brickhill Bridge northeast to road junction at Reaskcamoge.
C-SR-23	Road from Cratloe northeast through Gallows Hill to Glennagross.
C-SR-24	Views in and out of Lough Cullaunyheeda.
C-SR-25	Views in and out of Doon Lough.
C-SR-26	R466 between Broadford and O'Briensbridge.
C-SR-27	R463 from O'Briensbridge through Killaloe to outside Ogonnelloe.
C-SR-28	R463 from Tuamgraney to Mountshannon.
C-SR-32	Road from church at Ballylaghan crossroads as far as the crossroads at Caherhurly (part of the East Clare Way).

These designated Scenic Routes are of a visual nature and are representative of visual receptors. Each route is therefore addressed and analysed in Section 14.5: 'Visual Baseline', where ZTV mapping and on-site appraisals determined the likely visibility of the proposed turbines from the Scenic Routes.

14.4.1.2 Landscape Designations in Other Counties: Co. Limerick and Co. Tipperary

While the Wind Farm Site is located in Co. Clare, Co. Tipperary and Co. Limerick are also located within the LVIA Study Area and ZTV mapping indicates there is some theoretical visibility of the proposed turbines in those counties (recall above Section 14.3). Therefore, relevant designations pertinent to the LVIA conducted in this chapter are identified and listed below from the following county development plans:

- Tipperary County Development Plan 2022–2028 (hereafter, the TCDP);
- Limerick Development Plan 2022 – 2028 (hereafter, the LDP).

14.4.1.2.1 Landscape Character Areas – Other Counties (Tipperary and Limerick)

The Landscape Character Assessment for Co. Tipperary designates 23 No. LCAs within the county. Three of these are located within the LCA Study Area for the assessment of effects on landscape character (15km):

- LCA 12 – River Shannon Newport;
- LCA 13 – Arra Mountains-Lower Lough Derg;
- LCA 3 – Nenagh Corridor.

Chapter 6 of the LDP details information and mapping of the Landscape Character Assessment of Co. Limerick and the designated LCAs in the county. Information and mapping of LCAs is also included in the document called '*Environment, Heritage, Landscape & Green Infrastructure'* which is a 'Background Paper' forming part of the LDP. Both documents list, map and describe 10 designated LCAs. Two of these are located within the LCA Study Area for the assessment of effects on landscape character (15km):

- LCA 06 – Shannon Coastal Zone;
- LCA 01 – Agricultural Lowlands.

'Limerick City' is mapped in both documents (Figure 6.1 in Chapter 6 of the LDP; Figure 6 of the Background Paper), but is not defined or listed as an LCA; instead, it is divided into four spatial zones called Urban Character Areas. Figure 6.1 of the LDP divides Limerick City into the zones 'Caherdavin', 'Southern Environs', 'Castletroy' and 'City', whereas Figure 6 of the Background Paper maps all of these areas together as the 'Limerick City Administrative Area'. The landscape and visual effects of the proposed turbines from Limerick City and its environs are comprehensively assessed later in this chapter with the aid of photomontage visualisations (VP6 and multiple photowires). It is not deemed necessary to include an impact assessment for each Urban Character Area of Limerick City.

14.4.1.2.2 Protected Landscapes and Amenity Areas – Other Counties

Section 11.7 of the TCDP designates and protects certain landscapes of Tipperary as 'Primary' and 'Secondary' Amenity Areas due to their scenic quality and opportunities for tourism development. The TCDP's policy for the protection and management of these landscapes states:

> *'The Council will seek to ensure that a balance is achieved between the protection of sensitive landscapes and the appropriate socio-economic development of these areas. In this respect, development proposals will be required to demonstrate that they integrate and respect the visual quality of the amenity area'.*

As illustrated above in Figure 14-8, one primary amenity area is located in the northeast of the LVIA Study Area along the eastern banks of Lough Derg. As shown above in Figure 14-9, the ZTV shows there is predominantly no theoretical visibility in the Co. Tipperary Primary Amenity Area around Lough Derg, thus it is deemed that the Proposed Development will have no impact upon the setting or key landscape sensitivities of the Primary Amenity Area and it was therefore scoped out of further assessment. One very small area of theoretical visibility occurs at the peak of Mt. Tountina in the Primary Amenity Area; therefore, one photowire (labelled PWM) was produced from the lookout point at the top of this peak and is included in the impact assessments later in this chapter.

One very small portion of Secondary Amenity Area is located to the very east of the LVIA Study Area, approximately 18km from the nearest proposed turbine. The very small portion of this landscape in the LVIA Study Area with theoretical visibility of the proposed turbines generally comprises commercial forestry and is not considered to be a particularly sensitive part of the landscape. The Proposed

Development is unlikely to have a 'Significant' impact upon the setting or key landscape sensitivities of the Secondary Amenity Area and it was therefore not included in any further assessment.

14.4.1.2.3 Protected Scenic Amenity – Other Counties

Counties Tipperary and Limerick protect scenic amenity within their respective counties through the designation of Scenic Views, Prospects, and Scenic Routes. Both counties have different naming conventions and policy objectives pertaining to their respective designations (Objective EH1 017 of the LDP; Section 11.7.2 of the TCDP). In a general sense, it is a policy objective for each county to take additional care in the protection of unique and valuable Scenic Routes and Views.

Scenic Routes and Views of Co. Tipperary are identified and mapped in Volume 3 'Landscape Character Assessment and Schedule of Views and Routes' of the TCDP. Scenic Views and Prospects in Co. Limerick are identified and mapped in Map 6.2 (Section 6.4.2 'Views and Prospects') of the LDP. Several Scenic Routes from the TCDP and LDP were identified in the LVIA Study Area and are mapped below in Figure 14-8 and listed in Table 14-4.

Table 14-4 Co. Tipperary and Co. Limerick Protected Scenic Amenities in the LVIA Study Area

Protected View No.	Map Ref. (Figure 14-8)	Description in County Development Plan
County Tipperary		
V 44	T-SR-44	*'Views west and sections of the Road to the east of the R494'.*
V 55	T-SR-55	*'North and South of the R503 from Newport to Balycahill'.*
V 57	T-SR-57	*'View west on the Cork Road approach to Newport'.*
V 59	T-SR-59	*'View of the surrounding landscape from M7 including Annaholty and Rosfinch'.*
County Limerick		
Slieve Felim Scenic Drive	L-SR-1	*'In the east of the County, the Slieve Felim way route close to Murroe, makes an attractive walking route to complement the attractions of the Clare Glens'.*

These scenic designations are of a visual nature and are representative of visual receptors. Each route is therefore addressed and analysed in Section 14.5, where ZTV mapping and on-site appraisals determined the likely visibility of the proposed turbines from the Scenic Routes.

14.4.2 Landscape Character of the Site

'Landscape character' in this case refers to the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how people perceive this. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement, and creates the particular sense of place found in different areas. The identification of landscape character as outlined in the 'Landscape and Landscape Assessment: Consultation Draft of Guidelines for Planning Authorities' (DoEHLG, 2000) comprises the identification of primarily physical units (areas defined by landform and landcover) and, where appropriate, of visual units.

The Wind Farm Site was visited multiple times during 2022 and 2023 where an assessment of topography, drainage, landcover and land use was conducted in conjunction with other LVIA surveys. Information gathered during these visits have informed the following descriptions of the Proposed Development Site. The landscape character of the proposed Grid Connection is discussed at the end of this section.

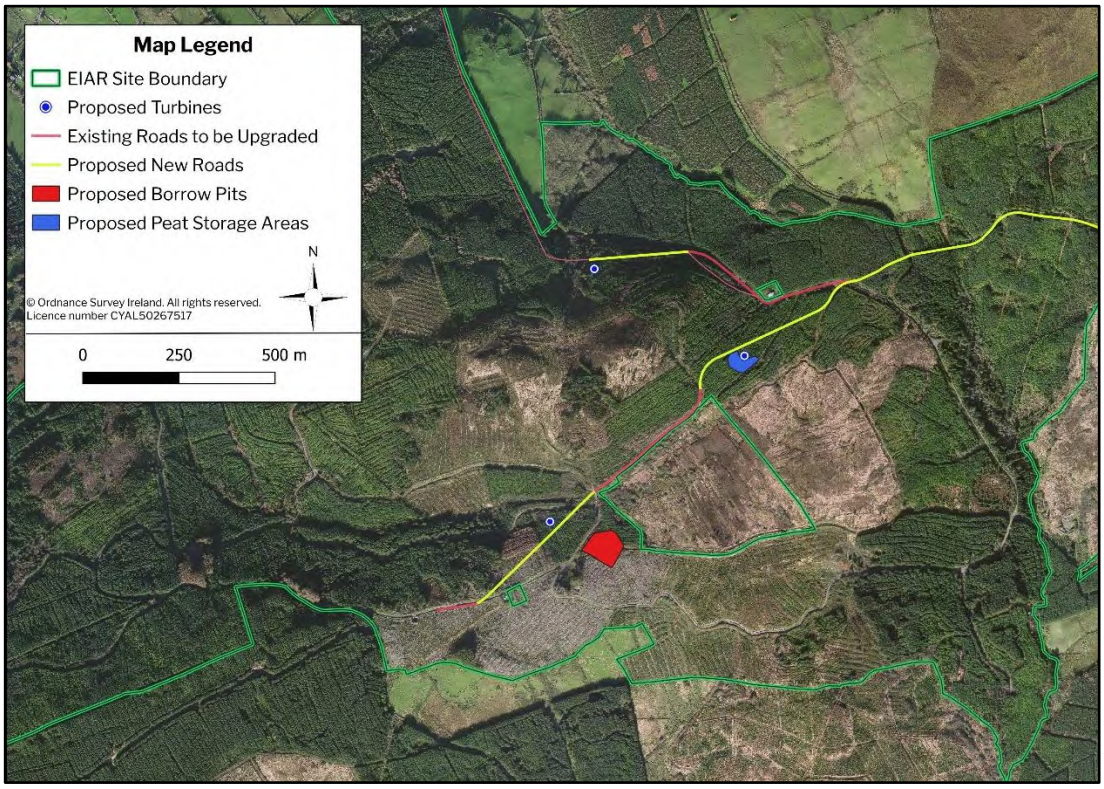

Figure 14-10 Aerial View of the Western Cluster of Turbines

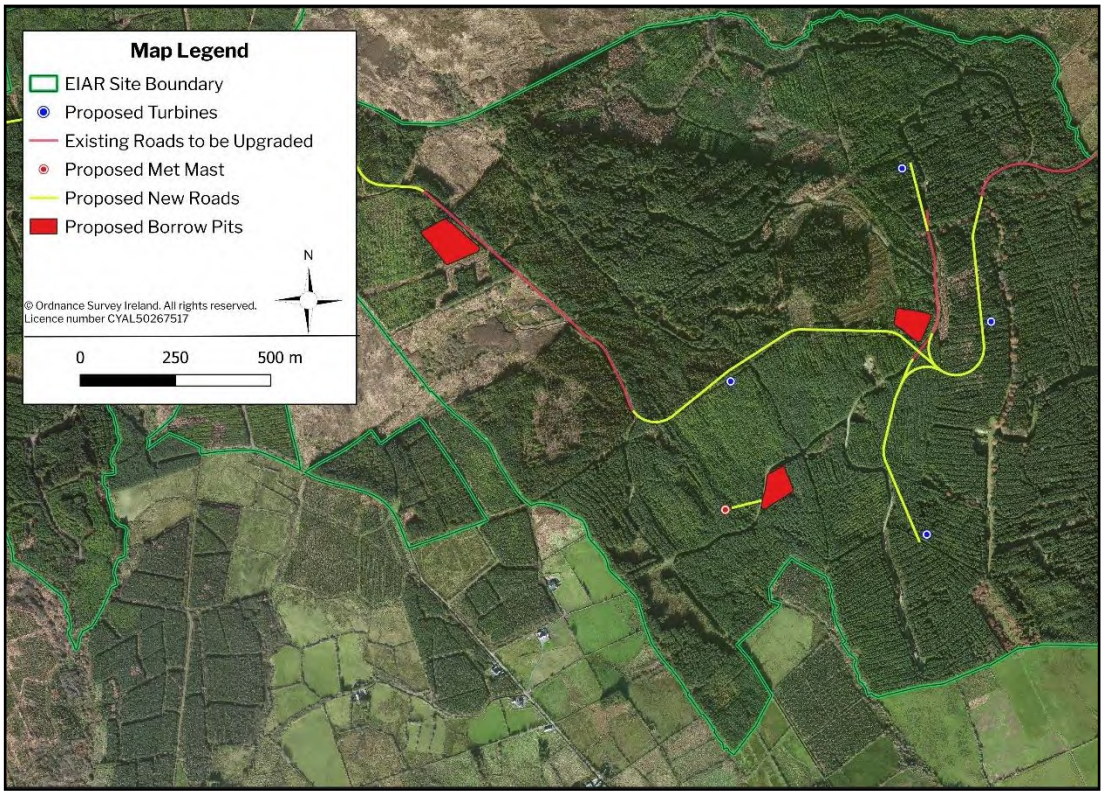

Figure 14-11 Aerial View of the Central Cluster of Turbines

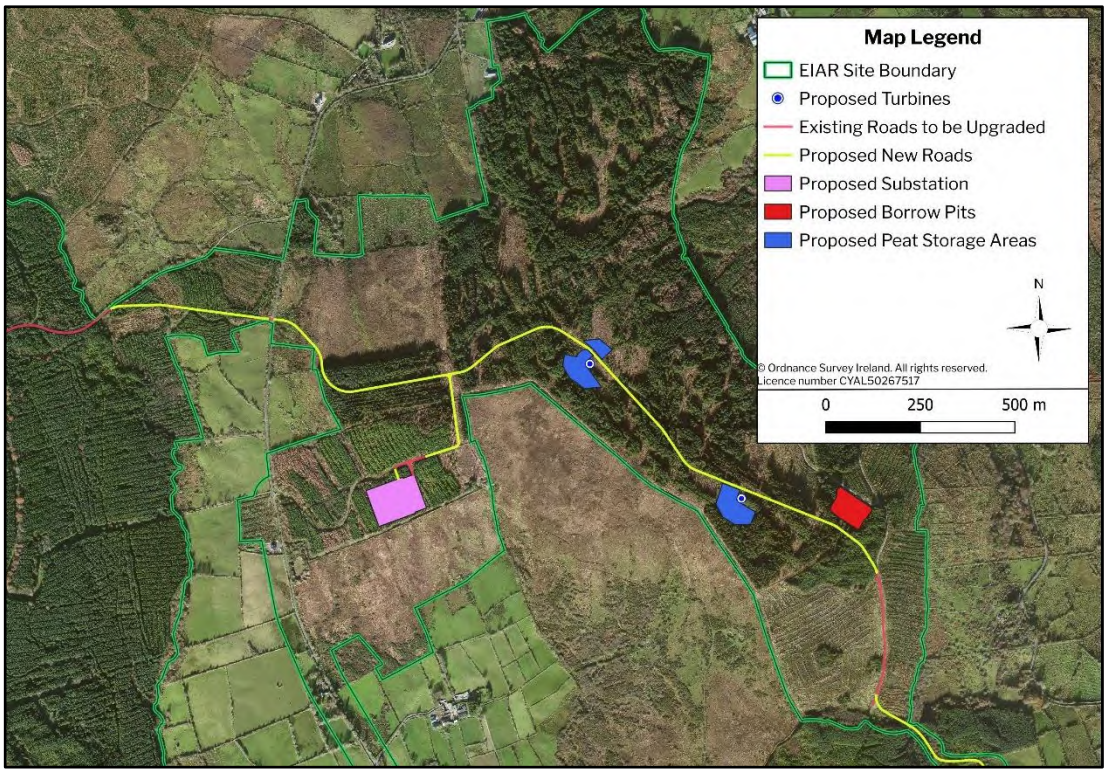

Figure 14-12 Aerial View of the Eastern Cluster of Turbines

Landform and Drainage

The Wind Farm Site is located on undulating upland terrain with a lot of topographical variation and changes in gradient. The topography is undulating, with the clusters of proposed turbines focused around different peaks in elevation, as shown in Figure 14-13 below. Turbines of the Western Cluster (T1–T3) are located at the highest elevated parts of the Wind Farm Site, clustered around the hill of Knockanuarha. Turbines from the Central Cluster (T4–T7) are situated on the southeast slope of the hill comprising the peaks Seefin, Knockaunnamoughilly, and Knockshanvo. Finally, turbines from the Eastern Cluster (T8 and T9) are located close to the top of the peak in Drumsillagh.

The proposed turbine clusters are separated from each other by valleys and peaks, creating a distinct visual separation between the different clusters. The proposed turbines are spaced across a large parcel of land, with 2.4km separating the Western and Central clusters, and 1.6km separating the Central and Eastern clusters. From a landscape perspective, the scale of the Wind Farm Site is large in relation to the number of proposed turbines, with large areas on-site being unoccupied by proposed turbines or other infrastructure.

N

Knockaunnamoughilly

Seefin

Knockshanvo

Knockanuarha

Drumsillagh

T01

T02

T03

T04

T05

T06

T07

T08

T09

0 0.5 1 km

Map Legend

- LVIA Study Area
- Proposed Turbines
- Elevated Peaks

Elevation (AOD)

- 1 Metre
- 100 metres
- 200 metres
- 300 metres
- 400 metres
- 500 metres
- Contours - 30m Interval
- Contours - 10m Interval

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Drawing No.

Figure 14-13

Drawing Title

Topograpghy of the Wind Farm Site

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:22,000	200513	30.04.2024	JW	JS

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The Wind Farm Site is located across 2 No. regional surface water catchments. The east and south of the Wind Farm Site is located in the Lower Shannon surface water catchment and the northwest of the Wind Farm Site is located in the Shannon Estuary North surface water catchment. Both regional catchments are located in the Shannon River Basin District.

The Lower Shannon Catchment (HA 25D) covers a total area of 1,041km^2 and includes the lower reaches of the River Shannon to Limerick City and the catchment of the Mulkaer River. The catchment is underlain by mostly impure limestones in low-lying areas and sandstone and metamorphic rocks in the uplands of the Slieve Bernagh and Arra Mountains in the northwest, and the Silvermines and Slieve Feilim Mountains in the east (see also Chapter 9: 'Hydrology and Hydrogeology' of this EIAR, in which all watercourses on-site are fully mapped).

Within the Lower Shannon surface water catchment, the Wind Farm Site is located in the sub-catchment labelled as 'Shannon[Lower]_SC_100'. More locally, this section of the Wind Farm Site lies within the catchment of the Blackwater (a.k.a. Clare) River. Several streams drain the Wind Farm Site and flow to the south before discharging into the Blackwater River. These tributaries of the Blackwater River include the O'Neill's, Mountrice, Drumsillagh rivers, the Sruffaunageeragh stream and several additional unnamed streams. The Blackwater River flows to the east, 3.2km to the south of the Wind Farm Site, before veering to the south and discharging into the River Shannon, 10.5km to the southeast.

Within the Shannon Estuary North surface water catchment, the Wind Farm Site is located in the sub-catchment labelled as 'Owenogarney_SC_010'. This area of the Wind Farm Site drains to the north and northwest towards the Owenogarney River via several unnamed streams and the Broadford River. The northeast of the site drains to the Broadford River which flows to the northwest before it discharges into Doon Lough 3.3km to the north of the Wind Farm Site. The Ahaclare River outflows from Doon Lough and is referred to as the Owenogarney River to the west of the Wind Farm Site. Meanwhile, the west of the Wind Farm Site drains via several streams, which flow to the northwest and discharge directly into the Owenogarney River. Downstream of the Wind Farm Site, the Owenogarney River discharges into Ballymulcashel Lough and Castle Lake. Further downstream, the Owenogarney River continues to the south, flowing through the village of Sixmilebridge, and past Bunratty before eventually discharges into the Shannon Estuary, 10km to the southwest.

Plate 14-5 Image of 19th Century Crag River Bridge spanning Crag River of the Owenogarney_030 Watercourse within the Wind Farm Site

Plate 14-6 Image of Watercourse flowing through the Northern Part of the Wind Farm Site

Landcover and Land Use

As can be seen from Figure 14-10 through Figure 14-12 above, landcover at the Wind Farm Site is dominated by coniferous forestry plantations comprised of Sitka Spruce and Lodgepole Pine. Only 2.6% of the Wind Farm Site is unplanted and either comprises wet heath habitats or is located along riparian buffer zones. An additional 6.1% of the forestry within the Wind Farm Site has been felled and is reverting naturally to wet heath.

The Wind Farm Site contains of an existing network of forestry access tracks. Access to the Wind Farm Site is via several local roads extending northwards from the R471 regional road. The Wind Farm Site can also be accessed via several small local roads from the north. The Site is primarily used for commercial forestry activities, as seen below in Plate 14-7 and Plate 14-8.

Plate 14-7 Forestry Access Track in the Northwest Part of the Wind Farm Site

Plate 14-8 View from within the Western Part of the Wind Farm Site

Plate 14-9 View to the Southeast from Approximate Location of the Western Cluster of Turbines

Plate 14-10 Forestry Access Track running between Proposed Turbines T5 and T6

Two waymarked walking routes pass through the Wind Farm Site: the East Clare Way and the 12 O'Clock Hills Walking Route. Both are shown below in Figure 14-14, where the East Clare Way can be seen to pass directly through the Central Cluster of turbines, and the 12 O'Clock Hills route passes directly through the Western Cluster.

The impact of the Proposed Development on these recreational receptors are comprehensively assessed in this Chapter (Section 14.7.3.3.3), including details of measures which will be implemented to offset effects on the recreational amenities of the 12 O Clock Hills at the Western Cluster. Amenities as part of the Proposed Development to offset effects are described previously in Section 14.1.3.4.

Plate 14-11 View Eastward from the East Clare Way, taken Close to the Location of Proposed Turbine T6

Plate 14-12 View East from Summit of the 12 O'Clock Hills Walking Route

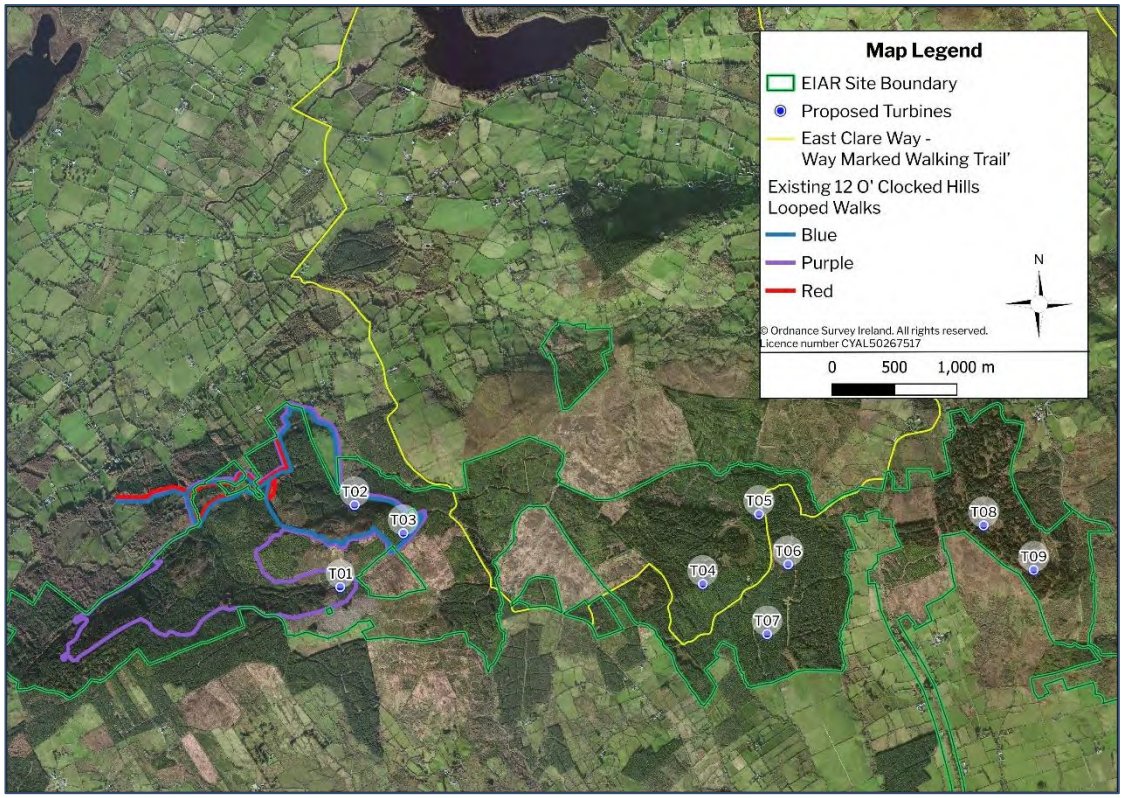


Figure 14-14 Existing Walking Routes within and nearby the Wind Farm Site

As detailed in Section 14.1.2.2, the key focus of the assessments in this Chapter are the impact of the proposed turbines at the Wind Farm Site, as these are the elements with the greatest likelihood to cause significant landscape and visual effects. However, all other elements of the Proposed Development are assessed, and the baseline landscape for these other areas of the site of the Proposed Development are considered below.

Landscape Character and Setting of the Proposed Substation

It is proposed to construct one 110 kV electricity substation within the Wind Farm Site, as shown previously in Figure 14-11 (and Figure 14-15 below). The footprint of the proposed on-site electricity substation compound measures approximately 13,450m^2, and will include 2 No. wind farm control buildings and all electrical substation components necessary to consolidate the electrical energy generated by each wind turbine as well as export that electricity from the wind farm substation to the national grid. The substation compound will be surrounded by an approximately 2.4m-high steel palisade fence (or as otherwise required by ESB), and internal fences will also segregate different areas within the main substation.

As seen below in Figure 14-15, the proposed substation is located within an area of commercial forestry, to the west of turbines T8 and T9 in the Eastern Cluster. Visibility of the proposed substation from receptors on this local road is expected to be limited from the south as a result of hummocky topography. Visibility is also limited from the west as a result of the screening and enclosure from the surrounding forestry. Two residential receptors located nearby to the proposed substation are the only two receptors in immediate proximity to this areas of the Wind Farm Site. As shown by Plate 14-13 below, both residential receptors will have limited views of the substation from their properties due to visual screening form localised landform, shrubs, trees and the existing forestry.

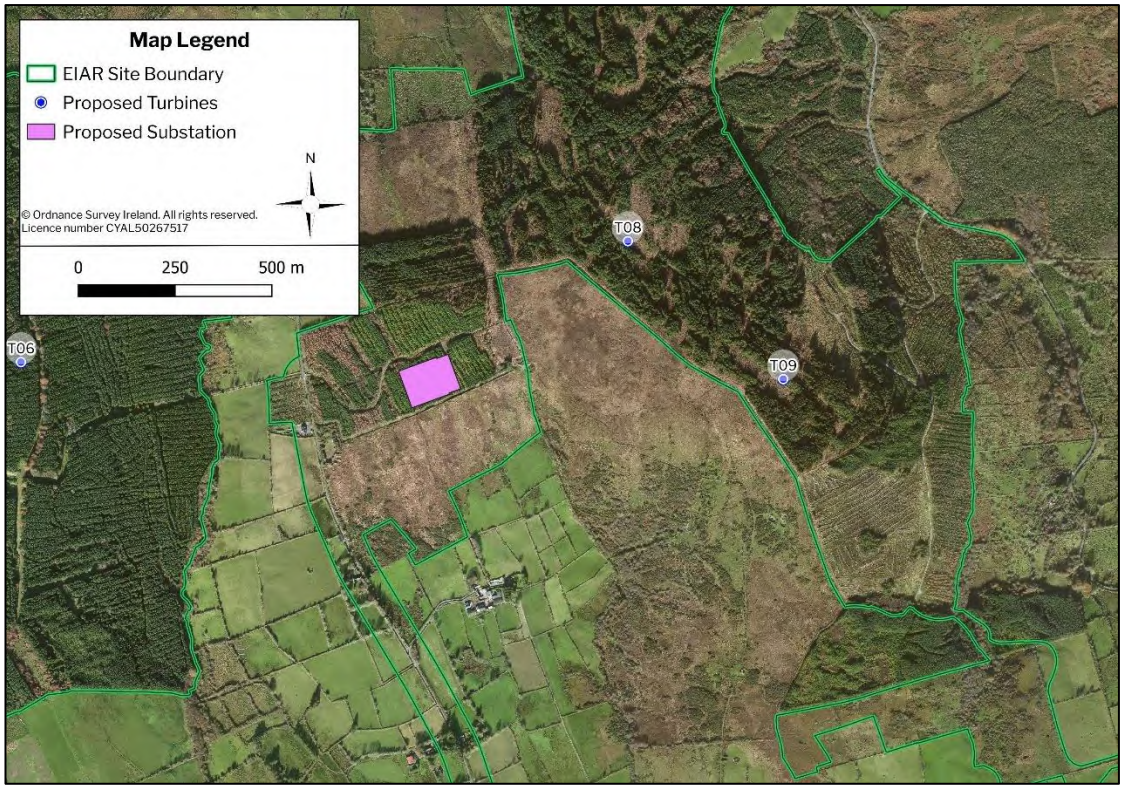


Figure 14-15 Aerial View of Proposed Substation Location

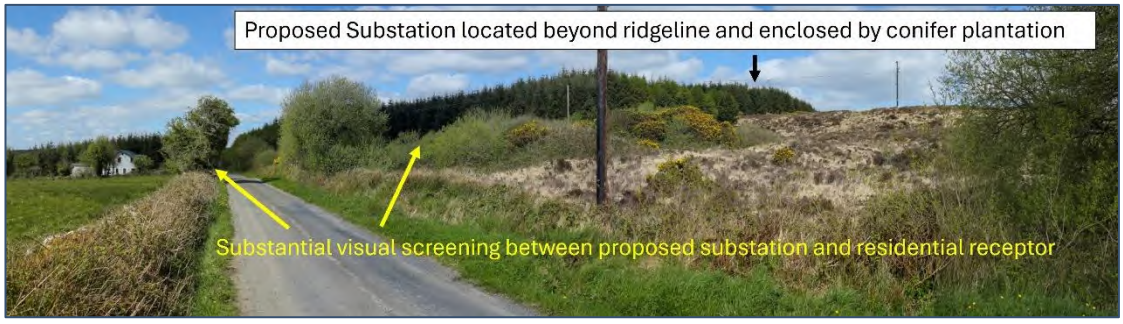


Plate 14-13 View north along local road to the south-west of the proposed substation. – no visibility likely to occur from local residential receptors.

Landscape Character of the Proposed Grid Connection

It is proposed to connect the substation to the existing Ardnacrusha 110kV substation, located several kilometres to the south of the Wind Farm Site. Connection via the Ardnacrusha route will comprise underground cabling, measuring approximately 9.2km in total, located within the public road corridor and forestry tracks for the entirety of the route. The path of the route can be seen on Figure 4-1b in Chapter 4 of this EIAR. To the north, the grid route predominantly follows the local road network through a rural landscape characterised by agricultural lands. To the south near Ardnacrusha the underground Grid Connection will come in proximity to residential receptors arranged alongside the local road network.

Turbine Delivery Route (TDR) and Temporary Transition Compound

Landscape and visual effects arising due to proposed upgrade works to the TDR will, in general, be very minor. However, a Temporary Transition Compound (TTC) is proposed adjacent to the N69 National Road west of Ferrybridge in Co. Limerick. This TTC is required as a space to transfer turbine blades from large haulage vehicles to other vehicles suitable for navigating the smaller roads of the

Slieve Bernagh Uplands. The TTC comprises three fields of flat agricultural grassland, seen in the image below. Construction of the TTC will involve some minor vegetation removal and re-surfacing with gravel hardstanding. Most of the mature boundary vegetation will be retained (excepting entrance and egress locations) enclosing the TTC and reducing visibility from receptors in the surrounding landscape which is very flat.

Plate 14-14 Drone View of Proposed Transition Area – View Looking West along the N69 National Road

14.4.2.2 Landscape Value and Sensitivity of the Proposed Development Site

Landscape value was assessed in order to determine the landscape sensitivity of the Proposed Development Site as well as the wider landscape setting and establish the capacity of the immediate landscape in which the Proposed Development will be built, as is prescribed by best practise guidance (GLVIA3, LI & IEMA, 2013, p.80):

> *'...as part of the baseline description the value of the potentially affected landscape should be established'.*

Comprehension of landscape value and the landscape susceptibility to change enables determination of the sensitivity of the landscape at a micro-level (meaning, the landscape of the Proposed Development Site) and its capacity to absorb the infrastructure of a wind farm development.

Determination of landscape value takes into consideration the scenic amenity designations, sensitivity and value designations found in the local landscape policy and other indications of landscape value attached to undesignated landscapes. Table 14-5 below describes various factors that aid in identifying landscape value. These factors and indicators were appraised collectively to determine a landscape value for the Wind Farm Site. The landscape value and susceptibility to change were then considered in forming a landscape sensitivity classification for the Wind Farm Site of either **Low**, **Moderate**, **High** or **Very High**.

Table 14-5 Indicators of Landscape Value

Indicator	Description
Landscape Designations	There are no sensitive Co. Clare landscape designations that fall within the Wind Farm Site. The Wind Farm Site is located within the LCA 8 – *Slieve Bernagh Uplands*, an LCA with the highest capacity for wind energy development in Co. Clare. Eight out of 9 No. proposed turbines are sited within a 'Strategic Area' for wind energy development in the CWES; the remaining 1 No. turbine is sited in an area designated as 'Acceptable in Principle'.
Landscape Elements / Qualities / Condition	Referring to the physical state of the landscape and the condition of each individual element: Due to its nature as a commercial forestry site, the Wind Farm Site is considered a modified working landscape. The condition of the landscape is degraded in several locations within the Site due to the forestry operations.
Scenic / Aesthetic Qualities	The Wind Farm Site has some natural aesthetic qualities, given its nature trails, lack of buildings and infrastructure and views of the surrounding landscape from its higher vantage points. However, the majority of views from within the Wind Farm Site are generally limited in many areas due to the steep topography and nature of the forestry.
Rarity or Conservation Interests	The habitats within the Wind Farm Site are dominated by conifer plantation (WD4) and clearfell (WS5) with small areas of wet heath (HH3), upland blanket bog (PB2), dry siliceous heath (HH2), cutover bog (PB4), and wet grassland (GS4). Eroding/upland rivers (FW1) are found throughout the Wind Farm Site.
Cultural Meaning / Associations	One recorded monument was identified in an upland area of the Wind Farm Site: A megalithic tomb, or wedge tomb, was identified at the Eastern Cluster, adding some cultural heritage value to the Wind Farm Site. Effects on this monument and others in the wider landscape setting are comprehensively assessed in Chapter 13: *Cultural Heritage* of this EIAR.
Wildness / Naturalness	The Wind Farm Site is in a highly managed area of coniferous plantation forestry. The entirety of the Wind Farm Site is located within this forested area and so it is considered to be a landscape highly modified by human interference.
Recreational Value	The 12 O'Clock Hills Waymarked Walking Route and the East Clare Way both pass directly through the Site, between the turbines of the Central and Eastern Clusters. These amenities contribute local recreational value to the Wind Farm Site.

In consideration of the factors detailed in Table 14-5 above, the landscape value of the Proposed Development Site is deemed **Low**.

Although there is recreational value to the Wind Farm Site, as the East Clare Way and 12 O'Clock Hills walking routes pass directly through the Proposed Development Site, these trails currently traverse a commercial forestry plantation, which is of lower landscape value. It is also noted that 8 of the 9 No. proposed turbines are sited within a 'Strategic Area' for wind energy development by the CWES, with the remaining turbine is sited in an area designated as 'Acceptable in Principle'. Considering these factors, the susceptibility of the Site to the proposed change is considered **Medium**. On balance, the overall landscape sensitivity of the Wind Farm Site is deemed **Low**.

Landscape value and sensitivity of other areas of the Proposed Development Site such as the Grid Connection route and Temporary Transition Area are deemed to be Low sensitivity.

14.4.3 Landscape Characterisation in the Wind Energy Development Guidelines for Planning Authorities

The following section considers the WEDGs (DoEHLG, 2006) and is cognisant of the Draft Revised WEDGs (DoHPLG, 2019). These guidelines offer guidance for the siting and design of wind energy developments in various landscape contexts by defining six landscape character types that represent most situations where wind turbines may be proposed. The guidance is intended to be indicative and general, noting that it represents the 'best fit' solutions to likely situations. The six landscape character types are 'Mountain Moorland', 'Hilly and Flat Farmland', 'Flat Peatland', 'Transitional Marginal Land', 'Urban/Industrial' and 'Coastal'. The guidelines note that where a wind energy development is located in one landscape character type but is visible from another, it will be necessary to decide which might more strongly influence the approach adopted for the assessment. In this regard it is noted that in the local planning policy, as outlined previously in Section 14.4.1: 'Landscape Designations and Policy Context', namely *Table 4a* of the CWES, the landscape of the Wind Farm Site is classified as 'Mountain Moorland'. Therefore, the best practice siting and design strategies prescribed for the 'Mountain Moorland' landscape character type in the WEDGs and Draft Revised WEDGs (DoEHLG, 2006; DoHPLG, 2019) were implemented for the Proposed Development.

14.4.3.1.1 *Mountain Moorland Landscape*

The key characteristic of the 'Mountain Moorland' landscape character type as stated in the WEDGs and Draft Revised WEDGs (DoEHLG, 2006; DoHPLG, 2019) are:

- *'Peaked, ridged or rolling mountains and upland with steep sides or gently formed valleys;*
- *Generally unenclosed;*
- *Landcover comprising blanket bog, a mottling of heather, wild grasses and some rush in wet flushes; and*
- *A landscape type of relative remoteness and often comprising pristine, unspoilt and remote landscapes'.*

Given the exposure and smoothness of their terrain, these landscapes are often sought for wind energy development. The exposure of mountains and the preference for wind energy developments to be located at high elevations result in high visibility.

> *'Mountain moorland may be inappropriate for wind energy development for reasons of natural heritage and the fact that some of these landscapes are of rare scenic quality and/or support some of the last wilderness areas of relatively pristine, unspoilt and remote landscapes. However, many examples of these landscapes should be open for consideration subject to appropriate design and landscape siting to minimise adverse impact and optimise aesthetic effect'.*

The siting and design guidance given for 'Mountain Moorland' in the WEDGs (DoEHLG, 2006) and Draft Revised WEDGs (DoHPLG, 2019) is set out below:

Location

> *'It may be acceptable to locate wind energy developments on ridges and peaks. They may also be appropriate, in certain instances, in a saddle between two peaks where they will be partially contained or "framed". A third acceptable location is lower down on sweeping mountainsides'.*

In terms of **location,** site selection was at the forefront of the Proposed Development design. In accordance with the guidance quoted above, all proposed turbines are sited on or near elevated peaks, and are clearly separated visually from the complexity of the lower ground. Siting for the infrastructure (including turbines) of the Proposed Development at its current location has resulted in sufficient distance from the greatest number of receptors within the nearby area. In terms of separation distance, the proposed turbines are also set-back a reasonable distance from dwellings, adhering to the recommended 4-times-tip-height set-back distance from the Draft Revised WEDGs (DoHPLG, 2019). Although the Draft Revised WEDGs are not yet adopted, this 4 x tip height set back distance is considered best practice for mitigating effects on residential visual amenity. The Proposed Development includes for a greater than 750m set-back distance from residential receptors. A distance greater than 10m beyond the minimum recommendations in the WEDGs (4 × Tip Height at 185m = 740m).

Spatial Extent

> *'Given the typical extensive areas of continuous unenclosed ground, larger wind energy developments can generally be accommodated because they correspond in terms of scale. However the spatial extent of a wind energy development would need to be reduced where a suggestion of smaller scale is provided by nearby landscape features'.*

In terms of **spatial extent**, the proposed turbines are sited within relatively small spatial extents within their clusters. The proposed turbines clusters are separated by valleys and peaks, creating a distinct visual separation between the different clusters. The proposed turbines are spaced across a large parcel of land, with 2.4km separating the Western and Central Clusters, and 1.6km separating the Central and Eastern Clusters. From a landscape perspective, the scale of the Wind Farm Site is notable in relation to the number of proposed turbines, with large areas on-site being unoccupied by proposed turbines or other infrastructure.

It can also be seen from the *Photomontage Booklet* and the photowires presented in Appendix 14-5: *Photowire Booklet*, that the proposed turbines are generally seen with an irregular layout that is visually sympathetic to the peaks in elevation that the separate clusters are located on.

Examples '1a' and '1c' provided on page 49 of the WEDGs (DoEHLG, 2006) provide clear support from the guidance for the design of the Proposed Development in relation to the spatial extent of the turbines; see the following quotes:

- *'1(a) Large wind energy development with random layout, irregular spacing and high turbines - this siting and design option is appropriate given the scale of this landscape;*
- *1(c) Wind energy development with relatively few and tall turbines'.*

Given the scale of the Wind Farm Site and the relatively few proposed turbines positioned throughout it, the design of the Proposed Development is clearly aligned with the guidance in this regard. Few tall turbines would be permissible in this landscape type that is classified as such in the local planning policy (recall *Table 4a* of the CWES). It is also noted that a larger wind energy development (as per example '1a' quoted above) would also be acceptable in this Mountain Moorland landscape type.

Spacing

> *'All spacing options are usually acceptable. Where a wind energy development is clearly visible on a crest or ridge there is considerable scope to vary the rhythm, though on simple*

ridges, regular spacing may be more appropriate. On sweeping and continuously even areas of mountain moorland or upland plateaux regular spacing may be most desirable'.

In terms of **spacing,** the proposed turbines are viewed as within a visual unit defined by the surrounding tracts of forestry on the site itself and are sited in a clustered layout or with even spacing in the case of the Central Cluster, which is located on the largest peak and takes up the largest extent. In this way the regular spacing of these turbines is appropriate for the specific landscape they are located within. Further, the proposed turbines are sited on or around peaks in elevation and within areas of commercial forestry, thus it is considered that the spacing of the turbines responds appropriately to the landcover and topography of the site given the clustered nature of the turbines around these peaks.

Layout

'All layout options are usually acceptable. However, the best solutions would either be a random layout, and clustered where located on hills and ridges (fig 1(a)), or a grid layout on sweeping and continuously even areas of moorland or plateaux (fig 1(b)). Where a wind energy development is close to a linear element, such as a river, road or long escarpment, a corresponding linear layout or staggered line might be most desirable'.

In terms of **layout**, the proposed turbines within their separate clusters are themselves arranged in a clustered layout around hilltops, in accordance with the guidance quoted above.

It is also noted that example '1d' given on page 50 of the WEDGs (DoEHLG, 2006) provides further support within the relevant national guidance for the design of the Central Cluster of proposed turbines, as follows:

'1(d) A wind energy development with a grid layout with tall turbines – the rhythmic grid layout is appropriate to the open expanse of moorland, especially when it relates to the geometric blocks of conifers'.

From viewpoint (VP)13 (see *Photomontage Booklet*), it can be seen that the Central Cluster of proposed turbines is located within blocks of commercial forestry, and in this way, the grid layout of this cluster relates appropriately to the geometric blocks of forestry that the proposed turbines are viewed as being within.

Height

'There would generally be no height restrictions on mountain moorlands as the scale of landscape is so great. However, shorter turbines may be more appropriate where they are located on small peaks and outcrops in order to maintain an appropriate scale. Profile, whether even or uneven, is dependent on topography: the more rugged and undulating (e.g., knolls and crags) the more uneven it will be. The profile of the wind energy development should not necessarily run in parallel to that of the topography'.

In terms of **height**, the proposed turbines are sited across relatively open and extensive upper ground, where they appear as large vertical objects within the landscape, appropriately scaled for the Wind Farm Site and the topographical features located within it, in accordance with the guidance quoted above.

Cumulative Effect

'The open expanse of such landscapes can absorb a number of wind energy developments, depending on their proximity. The cumulative impact will also depend on the actual visual complexity of landform, whether steeply rolling, undulating or gently sweeping. The more varied and undulating an area is topographically, the greater its ability to absorb and screen

wind energy developments. The aesthetic effect of wind energy developments in these landscapes is acceptable where each one is discrete, standing in relative isolation'.

In terms of **cumulative effect,** no other existing or permitted wind farms are located within or directly adjacent to the Wind Farm Site; therefore, two or more wind energy developments will not be visible within the same local landscape setting (within 5km) in a Do-Nothing Scenario. In a potential future baseline scenario, the proposed Oatfield Wind Farm is sited to the north of the Central Cluster and south of the Western Cluster. Information and mapping relating to the proposed Oatfield development are detailed below in cumulative context Section 14.6.3: 'Proposed Oatfield Wind Farm'. The proposed Oatfield turbines would be viewed within the same area of undulating upland landscape as the Proposed Development and this would be acceptable in accordance with the WEDGs guidance quoted above, considering the varied nature of the landform in this upland area.

Other existing, permitted and proposed wind energy developments in the LVIA Study Area are identified and mapped in Section 14.6 – *Cumulative Context.* Several of these permitted and proposed wind energy developments are visible from the Wind Farm Site itself and are visible within the wider landscape setting of the Slieve Bernagh Uplands. These other permitted and proposed developments are generally seen on other hills or mountains (in a future receiving environment), again aligned with the guidance quoted above or as demonstrated by example '1e' on page 51 of the WEDGs (DoEHLG, 2006). It is also noted that the scale of the Wind Farm Site is relatively large, with no sense that the 'Mountain Moorland' landscape is 'full' of turbines arising as a result of the Proposed Development, given the separation distances between the clusters of turbines (as outlined previously in this section). It is also the case, however, in accordance with the guidance quoted above, that the scale of the hills that make up the Wind Farm Site would be accepting of additional cumulative turbines.

14.4.4 Landscape Character of the Wider Landscape Setting

'Landscape character' in this case refers to the distinct, recognisable, and consistent pattern of elements that occur in a particular landscape and how it is perceived. The landscape surrounding the site to the north, west, southwest and southeast is considered a working agricultural landscape. It features a number of small lakes (e.g. Lough Gar, Doon Lough, Lough Cullaunyheeda, etc.) located north and northwest of the hills that make up the Wind Farm Site; although, as a result of the flat, heavily vegetated landscape in this part of the LVIA Study Area, views of the lakes are generally limited to areas in close proximity. Small tracts of woodland can also be seen throughout this area. The field boundaries formed by hedgerows predominate throughout the views and generally restrict visibility to medium ranges.

To the northeast and southwest of the site are areas of higher elevation, with two large upland areas surrounding the peak of Moylussa to the northeast and Woodcock hill to the southwest. Further northeast is Lough Derg, which flows south, forming the River Shannon to the east of the Proposed Development, on the other side of which is another rise in topography, forming the uplands of the Arra Mountains.

Plate 14-15 View to the Southwest from an Elevated Location on the Slopes of Moylussa in Glenomra Valley, facing towards the Wind Farm Site and Intervening Agricultural Valley

Plate 14-16 View to the North from 12 O'Clock Hills, showing the Settled Agricultural Landscape with Multiple Small Lakes

Plate 14-17 View from the Arra Mountains over Lough Derg and the River Shannon, with Moylussa in the Background

A number of smaller settlements occupy the surroundings of the Wind Farm Site. The closest settlement is Broadford, located approximately 3km away. Other notable settlements are O'Brienstown and Sixmilebridge which are within 10km of the proposed turbines, as well as Killaloe, located within 15km of the proposed turbines. A network of regional roads including the R465, R471, and R466 surround the site and service these settlements and the surrounding communities.

The largest settlement in the LVIA Study Area is Limerick City, located approximately 10km south of the proposed turbines, with larger road infrastructure, including a number of motorways, leading towards Limerick from different directions. The settlement of Shannon is also a notable feature of the wider landscape, located approximately 12.5km southwest of the nearest proposed turbine.

Plate 14-18 View to the East from within Sixmilebridge, with Knockanuarha (left) and Woodcock Hill (right) in the Background

The River Shannon travels south from Lough Derg, then curves to the west passing through Limerick City before widening into the Shannon Estuary, which is located to the southwest and makes up a large portion of the LVIA Study Area in this direction.

Plate 14-19 View from Bunratty, located North of where the River Shannon begins to widen into the Shannon Estuary

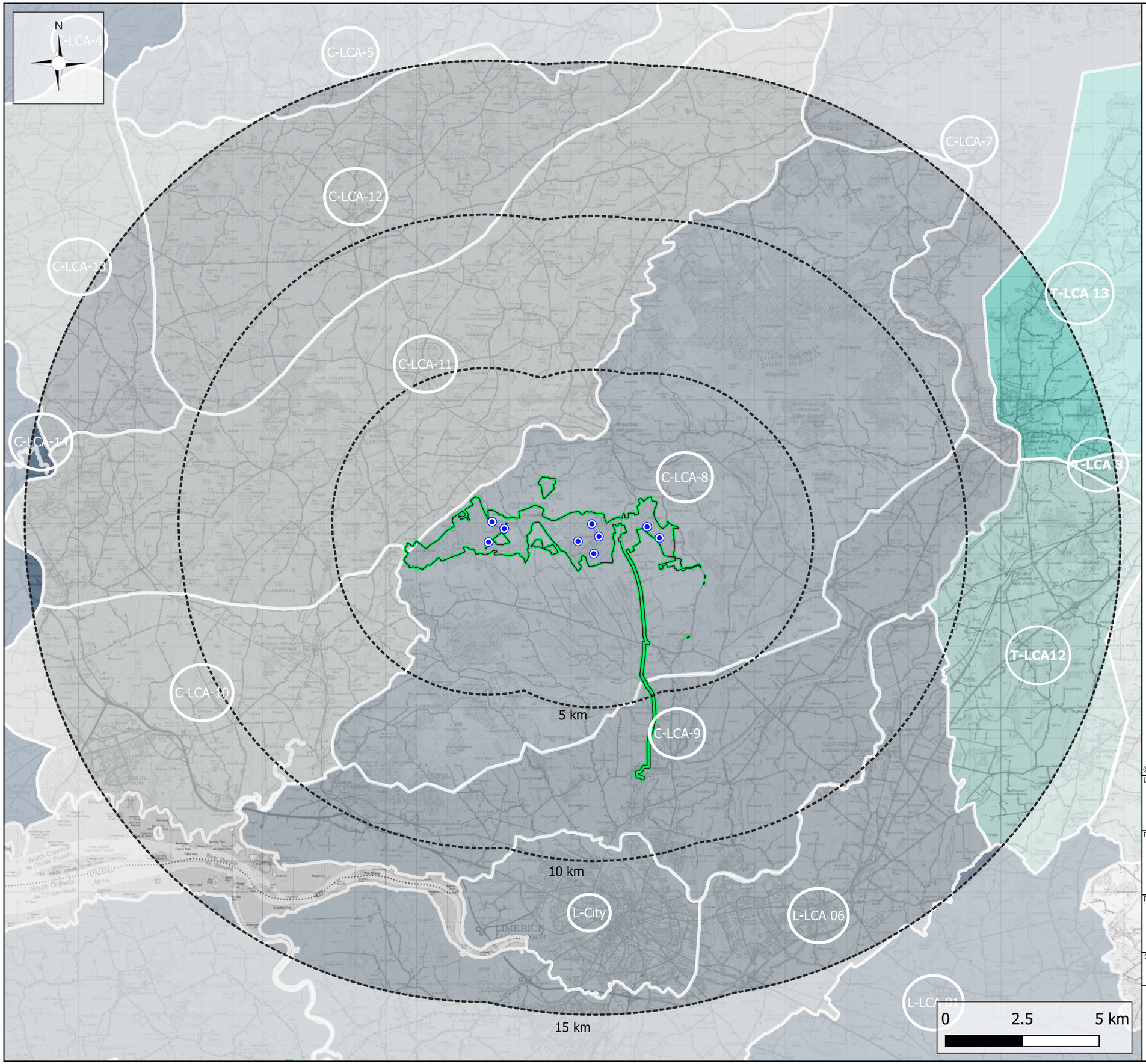
14.4.4.1 Designated Landscape Character Areas (LCAs) - Preliminary Analysis

As reported above in Section 14.2.1: 'Scope and Definition of the LVIA Study Area', the LCA Study Area for assessment of designated LCAs extends to 15km from the proposed turbines. Previously, in Section 14.4.1: 'Landscape Designations and Policy Context', 14 No. designated LCAs were identified within 15 km of the proposed turbines, in Counties Clare, Tipperary and Limerick and are mapped in Figure 14-16 below.

A map showing all LCAs within 15km of the proposed turbines and the distribution of theoretical visibility of the proposed turbines occurring in each LCA is shown in the ZTV and LCA Map (Figure 14-17) below.

Each LCA is listed in Table 14-6 below, as well as a description of theoretical visibility within each LCA, as indicated by the ZTV and LCA Map (Figure 14-17). The potential visibility of the proposed turbines was appraised during site surveys (multiple surveys conducted during 2022 and 2023) from all LCAs with limited or partial theoretical visibility. The ZTV and on-site visibility appraisals determine which LCAs are scoped in for full assessment later in this chapter (see also Appendix 14-2: *LCA Assessment Tables*); the scoping result is noted in the tables below. In some instances, LCAs were scoped out from further assessment in cases where a very small portion of the LCA with theoretical visibility is located in the LCA Study Area.

As noted previously, Limerick City is not a designated LCA but comprises multiple Urban Character Areas. The landscape and visual effects of the Proposed Development from Limerick City and its environs are comprehensively assessed in this chapter with the aid of photomontage visualisations (photomontage VP6 and multiple photowires). It was not deemed necessary to include an impact assessment for each Urban Character Area of Limerick City.



Map Legend

- LCA Study Area - 15km for assessment of effects on designated LCAs
- Proposed Turbines
- EIAR Site Boundary

Co. Clare Designated LCAs - Knockshanvo

- C-LCA-5 Slieve Aughty Uplands
- C-LCA-7 Lough Derg Basin
- C-LCA-8 Slieve Bernagh Uplands
- C-LCA-9 River Shannon Farmalnd
- C-LCA-10 Sixmilebridge Farmland
- C-LCA-11 East Clare Loughlands
- C-LCA-12 Tulla Drumlin Farmland
- C-LCA-13 Ennis Drumlin Farmland

Co. Tipperary Designated LCAs

- T-LCA 3 - Nenagh Corridor
- T-LCA 12 - River Shannon/Newport
- T-LCA 13 - Arra Mountains Lower Lough Derg

Co. Limerick Designated LCAs

- L-LCA 1 - Agricultural Lowlands
- L-LCA 6 - Shannon ICMZ
- L-Limerick City

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Drawing No.

Figure 14-16

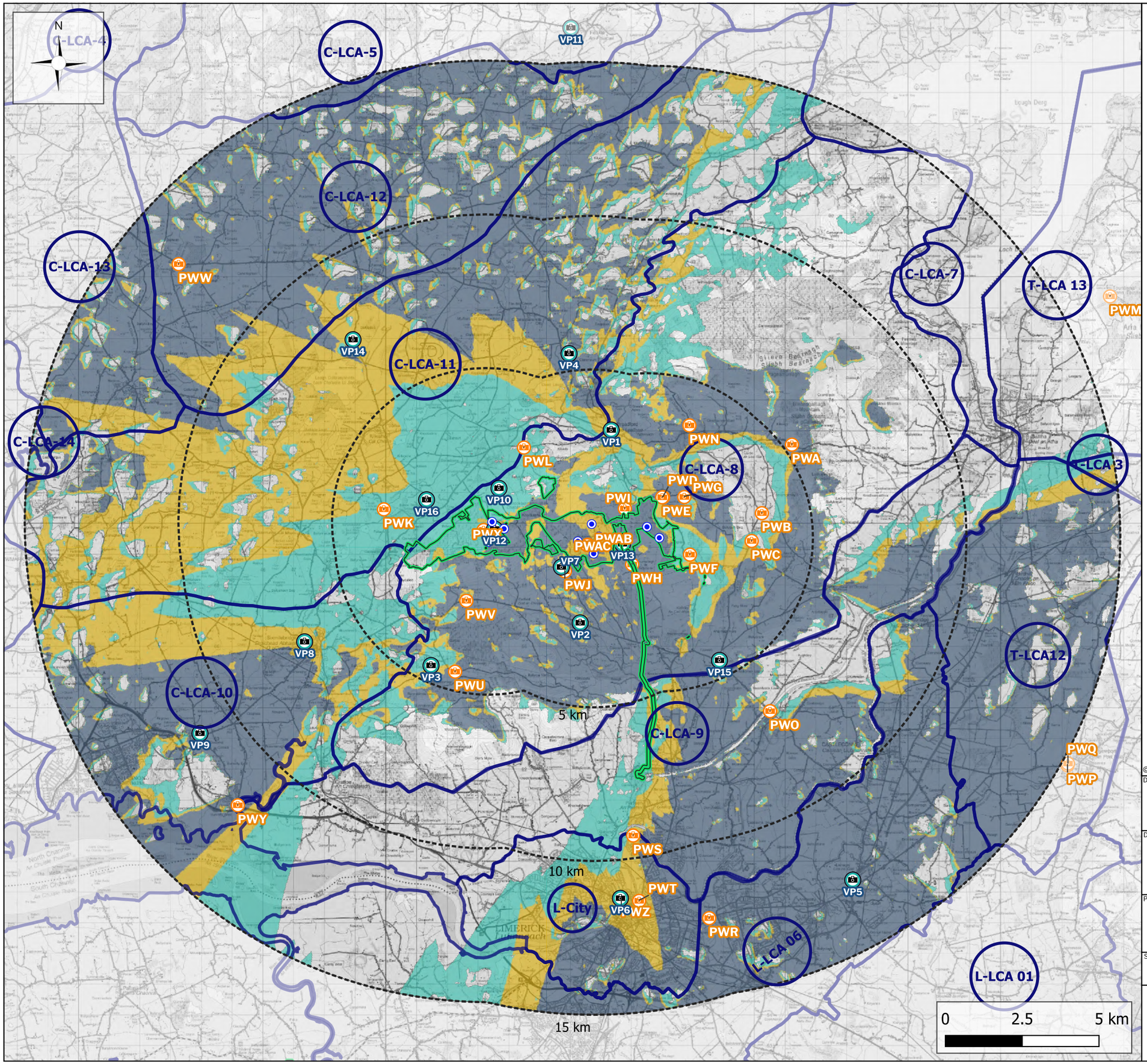
Drawing Title

Map of Designated LCAs

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:120,000	200513	18.07.2024	JW	JS



Map Legend

- LCA Study Area - 15km for assessment of effects on designated LCAs
- Proposed Turbines
- EIAR Site Boundary
- Designated Landscape Character Areas (LCAs)
- Photomontage Viewpoint Locations Volume 2 Booklet
- Photowire Viewpoint Locations Appendix 14-5

Half Blade Zone of Theoretical Visibility

- 1-3 Turbines Theoretically Visible
- 4-6 Turbines Theoretically Visible
- 7-9 Turbines Theoretically Visible

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Drawing No.

Figure 14-17

Drawing Title

ZTV and Map of Designated LCAs

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:120,000	200513	18.07.2024	JW	JS

Table 14-6 LCA Preliminary Analysis – Scoping LCAs in or out for Impact Assessment

Map Ref.	LCA	Theoretical Visibility (TV) as indicated by ZTV	Actual Visibility as determined during site visits	Scoped in for Assessment
Up to 5km				
C – LCA 8	Slieve Bernagh Uplands	Primarily full and partial TV within 5km of the proposed turbines with areas of primarily no TV to the northeast and southwest within 5–10km of the proposed turbines.	Visibility is far less than indicated by the ZTV, but the proposed turbines are likely to be visible in many areas of the LCA.	Yes
C – LCA 9	River Shannon Farmland	Primarily full TV in areas to the south and east of the proposed turbines. Large areas to the west of the of the LCA with no TV.	Visibility is far less than indicated by the ZTV, but the proposed turbines are likely to be visible in many areas of the LCA.	Yes
C – LCA 10	Sixmilebridge Farmland	Mostly partial TV within 5km of the proposed turbines with increasing areas of full TV from in the area within 5–15 km from the proposed turbines, with some patches of no TV between 10–15km.	Visibility is far less than indicated by the ZTV, but the proposed turbines are likely to be visible in many areas of the LCA.	Yes
C – LCA 11	East Clare Loughlands	Primarily partial TV within 5km of the proposed turbines with partial TV from 5–15km. The area west and north are characterized by patches of full and no TV.	Visibility is far less than indicated by the ZTV, but the proposed turbines are likely to be visible in many areas of the LCA.	Yes
5 to 10km				
C – LCA 12	Tulla Drumlin Farmland	Primarily full TV with undulations in the topography creating many small areas without TV.	Visibility will occur from elevated vantage points in the LCA, although far less than indicated by the ZTV.	Yes
T – LCA 12	River Shannon - Newport	Primarily full TV, some areas of no TV.	Visibility is far less than indicated by the ZTV, but the	Yes

			proposed turbines are likely to be visible in many areas of the LCA.	
L – LCA 6	Shannon ICZM	Primary full TV. No TV west of Limerick City	Visibility is far less than indicated by the ZTV, but the proposed turbines are likely to be visible in many areas of the LCA.	Yes
10 to 15km				
C – LCA 5	Slieve Aughty Uplands	The LCA is mostly outside the LCA Study Areas with one very small section within the 15km boundary primarily having full TV.	Visibility will occur from elevated vantage points in the LCA, although far less than indicated by the ZTV. Considering the set-back distance, and small portion of this LCA in the LCA Study Area, effects on this LCA will in reality be very limited.	No
C – LCA 7	Lough Derg Basin	No TV.	None anticipated.	No
C – LCA 13	Ennis Drumlin Farmland	Mostly intermittent patches of TV.	Visibility will occur from elevated vantage points in the LCA, although far less than indicated by the ZTV.	Yes
C – LCA 14	Fergus Estuary	One very small area of this LCA is within the LCA Study Area, comprising TV of 4–6 turbines.	Visibility is likely to be very limited in this LCA.	No
T – LCA 3	Nenagh Corridor	One very small section of this LCA is with the LCA Study Area, comprising partial TV.	Due to the distance and topographical features, views of the proposed turbines are expected to be very limited.	No
T – LCA 13	Arra Mountains – Lower Lough Derg	Primarily no TV with one small area to the south of the LCA having partial TV of 1–3 turbines.	Visibility is likely to be very limited in this LCA.	No

L – LCA 1	Agricultural Lowlands	One very small section is withing the LCA Study Area, with full TV.	Visibility is likely to be very limited in this LCA due to its location in the LCA Study Area.	No

The LCAs in Table 14-7 below are scoped out from further assessment in this LVIA, as visibility of the proposed turbines is likely to be very limited. In some cases, distance to the proposed turbines and the limited footprint of the LCA located within the LCA Study Area (15km for the assessment of effects on LCAs) precluded LCAs from being assessed further.

*Table 14-7 LCAs **Scoped out** from Further Analysis and Assessment*

Map Ref.	LCA
C – LCA 5	Slieve Aughty Uplands
C – LCA 7	Lough Derg Basin
C – LCA 14	Fergus Estuary
T – LCA 3	Nenagh Corridor
T – LCA 13	Arra Mountains – Lower Lough Derg
L – LCA 1	Agricultural Lowlands

Following the preliminary analysis, the 8n No. LCAs shown below in Table 14-8 below have been scoped in for assessment. A description of these LCAs and an impact assessment of the Proposed Development on each LCA is detailed in Appendix 14-2: LCA Assessment Tables. A summary of landscape effects on these LCAs are reported below in Section 14.7: 'Operational Phase Effects'.

*Table 14-8 LCAs **Scoped In** for Further Assessment*

Map Ref.	LCA
C – LCA 8	Slieve Bernagh Uplands
C – LCA 9	River Shannon Farmland
C – LCA 10	Sixmilebridge Farmland
C – LCA 11	East Clare Loughlands
C – LCA 12	Tulla Drumlin Farmland
C – LCA 13	Ennis Drumlin Farmland
T – LCA 12	River Shannon - Newport
L – LCA 6	Shannon ICZM

14.5 Visual Baseline

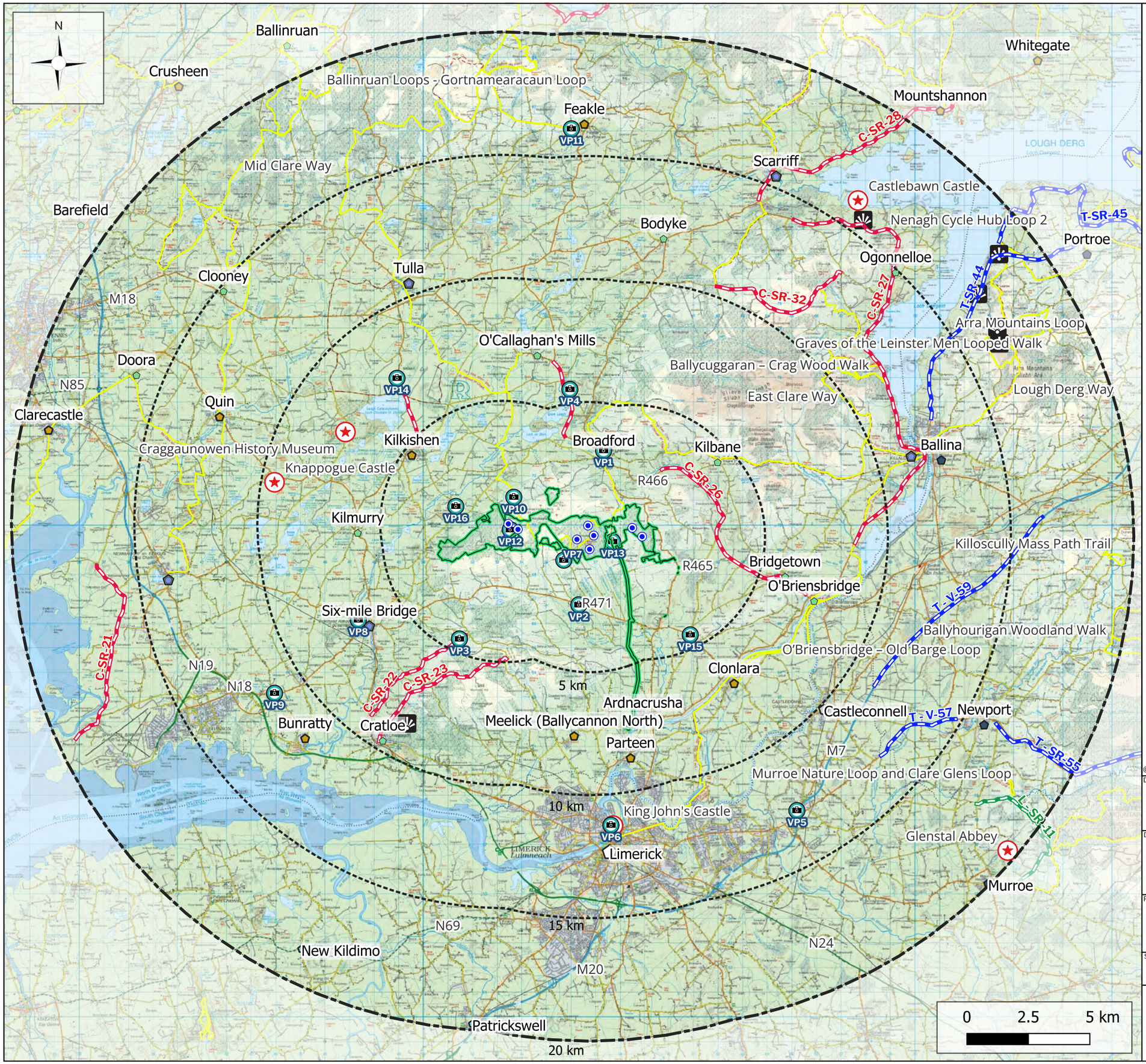
The main purpose of establishing the visual baseline is to identify the key visual receptors that should be considered for assessment within the LVIA Study Area. The visual baseline exercise uses ZTV mapping and on-site visibility appraisals to determine which receptors should be scoped out from further assessment.

14.5.1 Visual Receptors

The key visual receptors identified in the visual baseline exercise are represented by 'Viewpoints'. Viewpoints are locations from which visual effects are assessed using photomontages (see Appendix 14-1: *LVIA Methodology*). To this end, the following visual receptors have been identified within the LVIA Study Area:

- Designated Scenic Routes and Views;
- Viewing Areas (e.g., marked on OSi Maps);
- Settlements;
- Recreational Routes (Waymarked Walking Routes; Cycle Routes; Scenic Drives; Tourist Routes);
- Recreational, Cultural Heritage and Tourist Destinations;
- Transport Routes;
- Residential Receptors.

These visual receptors are identified in the visual baseline map below (Figure 14-18) and are listed in tables in the following sections along with theoretical visibility at those locations indicated by ZTV mapping, also seen below (Figure 14-19). During site visits conducted during 2023, the likely visibility of the proposed turbines was appraised from receptors where ZTV mapping has indicated theoretical visibility. Where there was no theorical visibility of the proposed turbines, or where on-site appraisal determined visibility of the proposed turbines to be very unlikely or very limited, the visual receptors were scoped out from further assessment.



Map Legend

- LVIA Study Area
- Proposed Turbines
- EIAR Site Boundary
- Photomontage Viewpoint Locations - Volume 2 Booklet

Scenic Routes and Views

- County Clare Scenic Routess
- County Tipperary Scenic Routes
- County Limerick Scenic Routes
- OSi Viewing Points

Settlements

Standardised Settlement Heirarchy

- County Hub Town
- Town
- Village
- Small Village of Local Importance

Recreational Routes and Destinations, Tourist and Cultural Heriatge Destinations

- Waymarked Walking Routes
- Recreational, Cultural Heritage and Tourist Destinations

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Drawing No.

Figure 14-18

Drawing Title

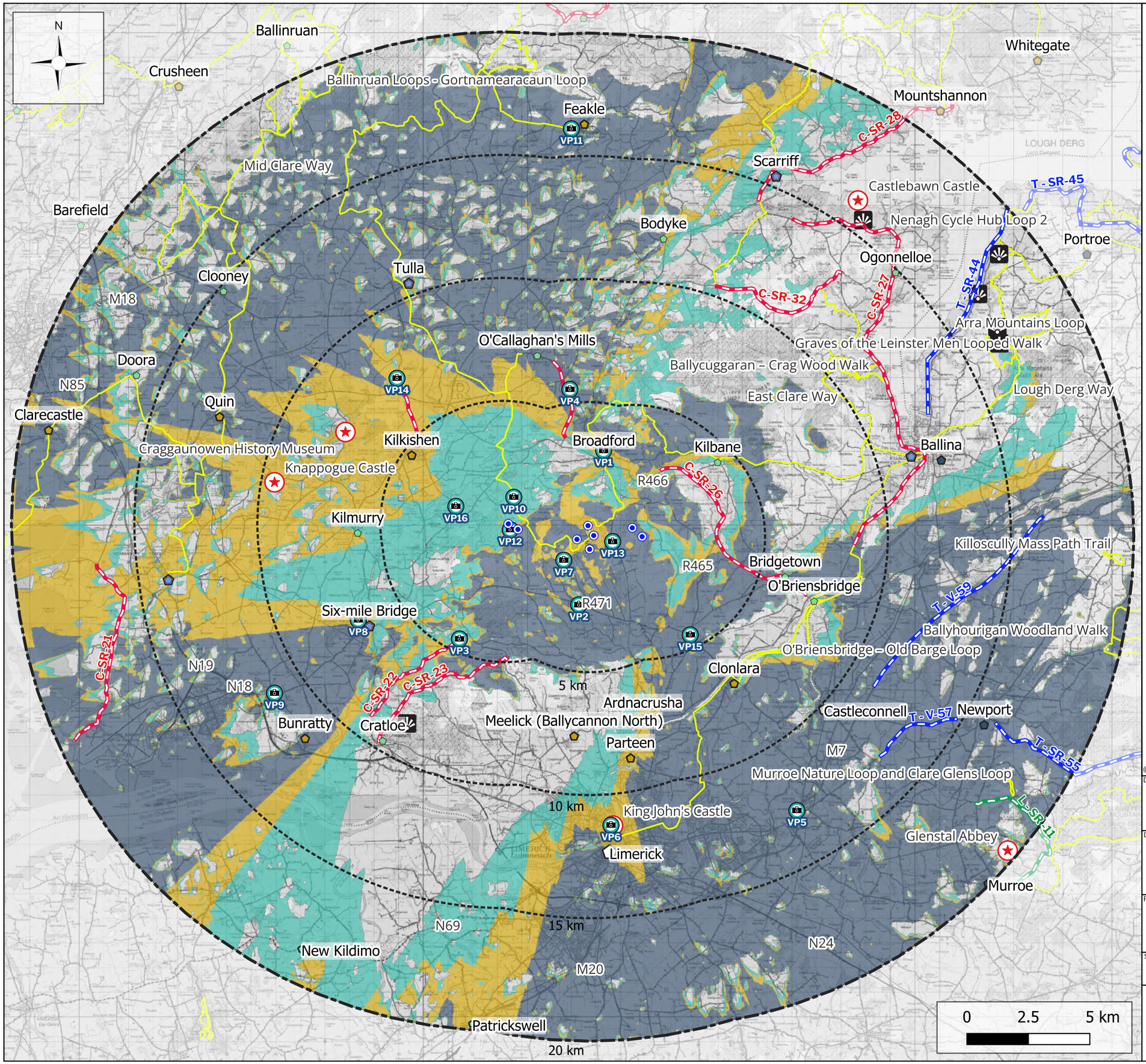
Visual Baseline

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	18.07.2024	JW	JS

MKO



Map Legend

- LVIA Study Area
- Proposed Turbines

Scenic Routes and Views

- County Clare Scenic Routess
- County Tipperary Scenic Routes
- County Limerick Scenic Routes
- OSi Viewing Points

Settlements

Standardised Settlement Heirarchy

- County Hub Town
- Town
- Village
- Small Village of Local Importance

Recreational Routes and Destinations, Tourist and Cultural Heriatge Destinations

- Waymarked Walking Routes
- Recreational, Cultural Heritage and Tourist Destinations

Visual Assessent Tools

- Photomontage Viewpoint Locations Volume 2 Booklet

Half blade Zone of Theoretical Visibility

- 1-3 Turbines Theoretically Visible
- 4-6 Turbines Theoretically Visible
- 7-9 Turbines Theoretically Visible

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Drawing No.

Figure 14-19

Drawing Title

Visual Baseline with ZTV

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	13.06.2024	JW	JS

MKO

14.5.1.1 Designated Scenic Routes and Views

Fourteen No. designated scenic routes and views were previously identified and described above in Table 14-3 and Table 14-4 which are shown previously in Section 14.4.1. These scenic amenity designations are mapped above in Figure 14-8 (Landscape Policy Context map) and Figure 14-18 (Visual Baseline map). Table 14-9 (below) lists the scenic designations located in the LVIA Study Area as well as any descriptions relating to the direction or object of the view detailed in the relevant county development plan. If detailed in the development plan, the direction of the view is reported in Table 14-9 and whether it is likely that the designated scenic amenity is directed towards the proposed turbines. Table 14-9 also notes the theoretical visibility of the proposed turbines from these designated locations is as indicated above by the ZTV and Visual Baseline map (Figure 14-19).

Based upon these initial visibility assessments, scenic amenity designations are either scoped in or out for full assessment in this LVIA.

**For purposes of clarity, continuity and reference to mapping figures in this chapter; designated scenic views are labelled 'V' and scenic routes 'SR', each is prefixed by the first letter of the county in which it is located e.g., 'C' for Clare and 'L' for Limerick. The last number in each label corresponds to the label or number assigned to each designation in the respective county development plans (e.g., C SR-22 = Clare – Scenic Route No. 22).*

Table 14-9 Designated Scenic Amenities - Preliminary Analysis

Map Ref.	Scenic Routes/View Description	Direction of View	Directed to Turbines?	Theoretical Visibility (TV)	Scoped in for Assessment
Up to 5km					
C SR-22	*'This view is from Brickhill Bridge northeast to road junction at Reaskcamoge'.* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	Partial	Yes
C SR-23	*"Road from Cratloe northeast through Gallows Hill to Glennagross."* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	Full TV within 5km of the nearest proposed turbines, transitioning to partial and primarily no TV beyond 6km from the nearest proposed turbine.	No, on-site appraisals determined that no actual visibility of the proposed turbines could be established as a result of screening from forestry located along the section with TV.
C SR-24	*'Views in and out of Lough Cullaunyheeda'.* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	Partial	Yes

Map Ref.	Scenic Routes/View Description	Direction of View	Directed to Turbines?	Theoretical Visibility (TV)	Scoped in for Assessment
C SR-25	*"Views in and out of Doon Lough."* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	Partial within 5km of the nearest proposed turbine, full TV beyond 5km.	Yes
C SR-26	*'R466 between Broadford and O'Briensbridge'.* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	Large stretch of no TV within 5km of the nearest proposed turbines, with a large stretch of partial and full TV along a section further south, within 5km of the nearest proposed turbine.	Yes
5-10km					
C SR-27	*'R463 from O'Briensbridge through Killaloe to outside Ogonnelloe'.* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	One small stretch within 5km of the nearest proposed turbine with full TV, no TV for the majority of the remainder of the scenic route.	No, on-site appraisals determined that no actual visibility of the proposed turbines could be established as a result of screening from topography and roadside vegetation located along the section with TV.
10-15km					
C SR-32	*'Road from Church at Ballylaghan crossroads as far as the crossroads at Caherhurly (part of*	Not indicated in the CDP.	Partially	There is one 150m stretch with partial TV, no TV along the	No, on-site appraisals determined that no actual visibility of the

Map Ref.	Scenic Routes/View Description	Direction of View	Directed to Turbines?	Theoretical Visibility (TV)	Scoped in for Assessment
	the East Clare Way)'. (Appendix 5, CCDP)			remainder of the route.	proposed turbines could be established from the stretch with TV given the level of roadside screening.
T SR-44	*'Views west and sections of the Road to the east of the R494".* (Volume 3, TCDP)	West and East.	Partially	No	No
C SR-28	*"R463 from Tuamgraney to Mountshannon."* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	One small stretch of partial TV between 10–15km from the nearest proposed turbines.	No, areas with partial visibility along this scenic route are within the Scariff Village where actual visibility is screened by buildings and trees in the area.
T SR-57	*'View west on the Cork Road approach to Newport'.* (Volume 3, TCDP)	West	Partially	Primarily full TV.	Yes
T SR-59	*"Views of surrounding landscape from M7 including Annaholty and Rossfinch."* (Volume 3, TCDP)	All directions.	Partially	Large stretches of full TV along the southwestern part of the scenic route, with patches of no TV to the northeast.	No, on-site appraisals determined that no, or very limited, actual visibility of the proposed turbines could be established from the stretch with TV given the level of roadside screening along the western side of the motorway.
15-20km					

Map Ref.	Scenic Routes/View Description	Direction of View	Directed to Turbines?	Theoretical Visibility (TV)	Scoped in for Assessment
C SR-21	*'Road through Ballysallagh east, southwards to Ballycally'.* (Appendix 5, CCDP)	Not indicated in the CDP.	Partially	Patches of full, partial and no TV along the route.	Yes
T SR-55	*'North and south of the R503 from Newport to Ballycahill'.* (Volume 3, TCDP)	North, South.	No	Primarily full TV.	No, given the distance from the nearest proposed turbines and the level of screening present in the landscape and along this scenic route, on-site visits determined that there will be no actual visibility of the proposed turbines.
L SR-1	*'In the east of the County, the Slieve Felim way route close to Murroe, makes an attractive walking route to complement the attractions of the Clare Glens'.* (Section 6.4.2, LCDP)	North, West.	Yes	Primarily full TV.	Yes

14.5.1.2 OSi Viewing Areas

Six viewing areas were identified in an Ordnance Survey of Ireland (OSi) map of the LVIA Study Area. These viewpoints are described below in Table 14-10. Five of these viewpoints have no theoretical visibility of the proposed turbines indicated by ZTV mapping and thus have been scoped out from further assessment. One viewing area has partial theoretical visibility and has been scoped in for further assessment.

Table 14-10 OSI Viewing Areas within the LVIA Study Area

View Description	Direction and Range of View	Directed to Turbines?	Theoretical Visibility	Scoped in for Assessment
View from the end of Cratloe Wood Forest Park Walking trail in the townland of Brickhill East.	Views facing southwest.	No	No	No
View along the R463 near Ogonnelloe in the townland of Caher.	Views facing north.	No	No	No
View from Tountinna Mountain on the Arra Mountains loop, in the townland of Killary	Panoramic views.	Yes	Partial	Yes
View along the Graves of the Leinster Men Looped Walk West of the Millennium Cross Trailhead, in the townland of Coolbaun.	Views facing north.	No	No	No
View along T SR-44 along the R494 in the townland of Townlough Lower.	Views facing northwest.	No	No	No
Lookout point on T SR-44 along the R494 regional road in the townland of Castletown.	Views facing north.	No	No	No

14.5.1.3 Settlements

In order to identify which settlements within the LVIA Study Area should be considered for viewpoint selection, the settlement strategies and hierarchy set out in the core strategy of the development plans of Counties Clare, Tipperary and Limerick were consulted. The settlement hierarchies of the three counties in the LVIA Study Area use differing classifications and naming conventions. MKO have created a standardised settlement hierarchy to enable cross-comparison of these population centres and clarity within the visual baseline mapping and throughout this assessment. Each settlement is given one of the following classifications in consideration of its size, population density and existing designation in the relevant county development plan.

- County Hub Town;
- Town;
- Village;
- Rural Settlement Clusters.

Table 14-11 below lists the settlements identified from the respective county development plans within the LVIA Study Area, also noting their county status within the settlement strategy and whether there is theoretical visibility indicated by ZTV mapping.

Table 14-11 Settlements within the LVIA Study Area

Settlement	County Settlement Hierarchy	Standardised Settlement Hierarchy	Theoretical Visibility (TV)	Scoped In for Assessment?
Up to 5 km				
Broadford	Small Village	Village	Partial	Yes
Kilkishen	Large Village	Village	Partial	Yes
Kilbane	Small Village	Village	None, with a small area of partial theoretical visibility.	No, site visits determined no locations where visibility of the proposed turbines could be established. At this distance within the heavily vegetated landscape, views of turbines will be substantially screened from view by vegetation and topography.
5 to 10 km				
Bridgetown	Small Village	Village	Mix of full and no visibility.	Yes
O'Briensbridge	Small Village	Village	Mix of full, partial, and no visibility.	Yes
Cloonlara	Large Village	Village	Full and Partial.	Yes
Sixmilebridge	Small Town	Town	Full and Partial.	Yes
Kilmurry	Small Village	Village	Partial	Yes
Castleconnell	Town	Town	Full	Yes
Ardnacrusha	Small Village	Village	Partial	No, site visits determined no locations where visibility of the proposed turbines could be

Settlement	County Settlement Hierarchy	Standardised Settlement Hierarchy	Theoretical Visibility (TV)	Scoped In for Assessment?
				established. At this distance within the flat, heavily vegetated landscape, views of turbines will be substantially screened from view.
Parteen	Large Village	Village	Partial	Yes
Cratloe	Small Village	Village	None	No
Meelick	Large Village	Village	None	No
10 to 15 km				
Tulla	Small Town	Town	Mix of full, partial, and no visibility.	Yes
Clooney	Small Village	Rural Settlement Cluster	Full	Yes
Killaloe	Small Town	Town	No	No
Athlunkard	Large Village	Village	Full	Yes
Bunratty	Large Village	Village	Full	Yes
Shannon	Metropolitan Area	County Hub Town	Mix of full, partial, and no visibility.	Yes
Limerick	City	County Hub Town	Full and Partial	Yes
New Market-on-Fergus	Small Town	Town	Mix of partial and no visibility.	No, views of turbines at this receptor will be partially screened by topography with primarily blade tips visible, these will be substantially screened by vegetation and built infrastructure in the flat landscape.

Settlement	County Settlement Hierarchy	Standardised Settlement Hierarchy	Theoretical Visibility (TV)	Scoped In for Assessment?
Quin	Large Village	Village	Full	Yes
Bodyke	Small Village	Rural Settlement Cluster	Mix of partial and no theoretical visibility.	No. Likely to be very limited visibility of the proposed turbines from most areas in an around this settlement due to visual screening from the built environment, vegetation and distant landform.
15 to 20 km				
Clarecastle	Large Village	Village	Mix of full, partial, and no visibility.	No, site visits determined no locations where visibility of the proposed turbines could be established. At this distance within the flat, heavily vegetated landscape, views of turbines will be substantially screened from view.
Doora	Small Village	Village	None	No
Feakle	Large Village	Village	Full	Yes
O'Gonnelloe	Small Village	Village	None	No
Scarriff / Tuamgraney	Service Town	Town	Mix of partial and no visibility.	No, given the level of topographical screening that will occur from locations around this receptor and the distances involved, there will be very limited or no

Settlement	County Settlement Hierarchy	Standardised Settlement Hierarchy	Theoretical Visibility (TV)	Scoped In for Assessment?
				visibility of the proposed turbines.
Newport	Local Town	Town	Full	Yes
Murroe	Large Village	Village	Mix of full, partial, and no visibility.	No, site visits determined that there were no locations where visibility of the proposed turbines could be established. At this distance within the flat, heavily vegetated landscape, views of turbines will be substantially screened from view.
Patrickswell	Rural Cluster	Rural Settlement Cluster	Partial	No, given the level of topographical screening that will occur from locations around this receptor and the distances involved, there will be very limited or no visibility of the proposed turbines.
New Kildimo	Small Village	Rural Settlement Cluster	Partial	No, given the level of topographical screening that will occur from locations around this receptor and the distances involved, there will be very limited or no visibility of the proposed turbines.

14.5.1.4 Recreational Routes

Recreational routes are sensitive receptors as people are likely to be using them in a recreational capacity where value is likely to be placed upon views and the scenic amenities of the landscape. The term recreational routes encompass the following:

- Waymarked walking routes (source: Sport Ireland designated trails);
- Cycle routes (source: Sport Ireland designated cycle routes);
- Scenic drives and tourist routes (e.g., the Wild Atlantic Way).

Routes were identified and located within the LVIA Study Area by examination of OSi maps and online sources such as: Sportireland.ie/outdoors/find-your-trails; Heritagemaps.ie and Activeme.ie. (these online resources were accessed in 2022 and 2023). Many routes exist of differing scale and prominence, thus only recreational routes of County or National importance were included in this LVIA. The identified routes are shown above in Figure 14-18 and listed below in Table 14-12, along with theoretical visibility distributed upon each route by ZTV mapping.

Table 14-12 Recreational Routes within the LVIA Study Area

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
Up to 5km				
East Clare Way	*'A 172km circular route that crosses the Slieve Bernagh Mountains before descending to the Clare lakeland areas around Tulla and Feakle. Circling Lough Graney, the route then climbs again over the rugged boglands of the Slieve Aughty Mountain back towards Lough Derg. The Way returns through the hills towards Scarriff and on to complete its circuit back at Killaloe'.* (Clare Walks)	A large portion of this route has theoretical visibility of the proposed turbines.	This trail passes directly through the Wind Farm Site, so there will be views of the proposed turbines. In reality, site visits determined that while there will be instances of visibility along the sections of this route within the wider study area, the majority of the views of the proposed turbines will likely occur within 5km of the site.	Yes
12 O'Clock Hills Looped Walks	*'This trail follows forest track, hard-cored pathway and boardwalk with some muddy spots on forest sections,*	The vast majority of this route has partial theoretical visibility of the proposed	There will be multiple views of the proposed turbines along this route considering its proximity to the proposed turbines.	Yes

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
	climbing steadily to the 12 O'Clock Hills peaks and then descending, passing sites of historic and cultural interest such as abandoned dwellings, old wells and mass rocks and along a section of Crag River with its stone bridge and waterfalls after heavy rain, taking in very scenic countryside with shaded stream-side paths, forest trails and open bog offering impressive views from higher up'. (Sport Ireland)	turbines, with the southeastern extent having full theoretical visibility.		
5 to 10km				
Lough Derg Way	*'The Lough Derg Way is a 64km walking route that starts in Limerick City and follows the River Shannon and its associated canals northwestwards to the lake port of Dromineer on Lough Derg'.* (Sport Ireland)	There is theoretical visibility along this route from Limerick City to Cloonlara, and another stretch of theoretical visibility from O'Briensbridge until a point just south of Killaloe.	There will be some views of the proposed turbines from along this route, although it is noted that from where it joins the River Shannon, views of the proposed turbines will be heavily screened by vegetation bordering the river.	Yes
O'Briensbridge – Parteen Weir	*'This loop follows the embankment of the Shannon Headrace as far as Parteen Weir, returning along the banks of the River Shannon. Apart from the climb up the road to join the embankment and descent off it, this is*	Primarily full theoretical visibility.	There is a large amount of vegetation bordering the banks of the River Shannon and the path of this route. A relatively high raised bank will prevent views from the southeastern half of the route, with views of the proposed turbines possibly occurring from the	Yes

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
	a level walk on grassy and riverside paths'. (Sport Ireland)		northwestern half of the route, from the raised bank following the river.	
O'Briensbridge – Errinagh Bridge	*'This loop follows the banks of the River Shannon and the tow path of the Errinagh Canal returning along the embankment of the Shannon Headrace. Apart from the climb up onto the embankment this is a level walk on sandy path, sandy road, tarred road, grassy path and field. It passes through a section of natural woodland'.* (Sport Ireland)	Primarily no theoretical visibility, with a small stretch of visibility within Cloonlara.	There will be no visibility of the proposed turbines from the stretch of this route with theoretical visibility, given the level of screening provided by vegetation in the landscape and the built infrastructure of Cloonlara.	No
O'Briensbridge – Old Barge Loop	*'This loop follows the banks of the River Shannon and the tow path of the Errinagh Canal as far as Clonlara, returning along the embankment of the Shannon Headrace. Apart from the climb up onto the embankment this is a level walk on sandy path, sandy road, tarred road and grassy path. It passes through a section of natural woodland'.* (Sport Ireland)	Primarily no theoretical visibility with some very small stretches of partial theoretical visibility.	There will be no actual visibility of the proposed turbines from this route given the vegetative screening along the river where theoretical visibility exists.	No
10 to 15km				
Mid Clare Way	*'A 130km long circular walking route around the centre of County*	A large portion of this route has theoretical visibility of the	In reality, site visits determined that while there will be instances of visibility along the	Yes

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
	Clare in the west of Ireland, with the county capital, the busy and picturesque town of Ennis, at its centre. The route touches on the Burren to the north and the broad Shannon Estuary to the south. Terrain on the route consists mainly of quiet tarmac side roads and farm roads with only brief sections on forestry tracks and through fields'. (Sport Ireland)	proposed turbines.	sections of this route within the wider study area, views of the proposed turbines will be well-screened with the proposed turbines seen as small features in the background of views.	
Ballycuggaran – Crag Wood Walk	*'This walk follows forest road, forest track and minor road through dense forest and open hillside on the shoulders of Feenlea Mountain and Crag'.* (Sport Ireland)	No theoretical visibility.	No actual visibility.	No
15 to 20km				
Graves of the Leinster Men Looped Walk	*'This trail, mostly on very quiet tarmac road with the final descent on purpose-built gravel footpath, takes the walk around the western slopes of Tountinna Mountain, passing through remote countryside with exceptionally spectacular and impressive views of Lough Derg and the surrounding*	Primarily no theoretical visibility with some very small stretches of partial theoretical visibility.	There are potential views of the proposed turbines from the higher points along the trail.	Yes

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
	area. The primary feature of interest is the remains of the Graves of the Leinster Men'. (Sport Ireland)			
Arra Mountains Loop	*'This fine walk on tarmac roads, bog roads, farm tracks, purpose built gravel walking paths and through fields at the northern edge of the Sliabh Arra hills offers the opportunity for some relatively strenuous exercise rewarded with impressive views of Lough Derg and the surrounding area'.* (Sport Ireland)	Primarily no theoretical visibility with some very small stretches of partial theoretical visibility.	There are potential views of the proposed turbines from the higher points along the trail.	Yes
Ballinruan Loops - Gortnamearacaun Loop	*'This trail offers pleasant walking on minor roads, forest tracks and forest and bog paths and old sunken tracks through a variety of landscape, including farmland, evergreen and deciduous woodland and blanket bog. The expansive bogland at the highest point is a good example of cutover and recovering blanket bog and also provides extensive views in all directions including towards the Slieve Aughty Mountains and the Burren*	Primarily no theoretical visibility with some very small stretches of partial theoretical visibility.	The section of the route with theoretical; visibility is heavily forested, with limited external views in the direction of the proposed turbines.	No

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
	while the Hen Harrier and Merlin are resident in the general area'. (Sport Ireland)			
Nenagh Cycle Hub Loop 2	*'This trail allows access to some of the more spectacular views of Lough Derg before descending into Castlelough and on through a working farm, along a slight off-road section to Garrykennedy'.* (Sport Ireland)	No theoretical visibility.	No actual visibility.	No
Murroe Nature Loop and Clare Glens Loop	These are 2km and 4km walking routes through a heavily wooded gorge and forest park.	Primarily full theoretical visibility.	There are limited external views from these looped walks given the nature of the wooded areas they are located within. Given this screening and the distance from the proposed turbines, there will be no actual visibility of the Proposed Development.	No
Ballyhourigan Woodland Walk	*'This loop follows forestry tracks and woodland trails to explore the lower afforested shoulders of Keeper Hill'.* (Sport Ireland)	Primarily full theoretical visibility along the parts of the trail located within the LVIA Study Area.	There are limited external views from this trail given the nature of the wooded areas the route is located within. Given this screening and the distance from the proposed turbines, there will be no actual visibility of the Proposed Development.	No
Killoscully Mass Path Trail	*'Nestled in the foothills of Keeper Hill, this superb, very enjoyable walk follows the old Mass Path and*	No theoretical visibility.	No actual visibility.	No

Route Name	Description	Theoretical visibility	Actual Visibility	Scoped in for Assessment?
	quiet roads passing many sites of local history and heritage interest with excellent vistas of the surrounding countryside and fine views of the Silevermines Mountains sloping down to the Mulcair River'. (Sport Ireland)			

14.5.1.5 Recreational, Cultural Heritage and Tourist Destinations

Popular recreational, cultural heritage and tourist destinations were identified in the LVIA Study Area through a desktop exploration of localised tourism plans as well as considering the most popular tourism destinations in Counties Clare, Tipperary and Limerick listed on Tripadvisor.ie (and other similar websites accessed in 2022 and 2023). Prominent outdoor tourism, cultural heritage, and recreational destinations identified in the LVIA Study Area are listed below in Table 14-13.

Table 14-13 Recreational, Cultural Heritage and Tourist Destinations within the LVIA Study Area

Tourist Destination	Description	Theoretical Visibility	Actual Visibility	Scoped in for Assessment?
Up to 10km				
Knappogue Castle	Tower house built in 1467 and expanded in the mid-19th century, located in the parish of Quin, Co. Clare, Ireland. It has been restored and is open for guided tours.	Partial	Site visits determined that due to the mature trees surrounding this site, there will be no actual visibility of the proposed turbines from the surrounds of the castle.	No
Craggaunowen History Museum	Archaeological open-air museum in eastern Co. Clare, Ireland. It contains reconstructions of ancient Irish architecture including a dolmen, crannog and currach boat, as well	Partial to None.	The Craggaunowen site is surrounded on all sides by wooded areas. As a result there are limited external views in the direction of the Proposed	No

Tourist Destination	Description	Theoretical Visibility	Actual Visibility	Scoped in for Assessment?
	as showing reconstructions of a Ringfort, Fulachta Fia (Bronze Age cooking and industrial site) and Standing Stone (Ogham Stone).		Development and the proposed turbines will not be seen.	
10-15km				
Bunratty Castle and Folk Park	Fifteenth century castle located in Bunratty Village in Co. Clare. This castle is a popular tourist destination with historical enactments and dining.	Full theoretical visibility.	Site visits determined that there is unlikely to be visibility off the proposed turbines from within the grounds of the castle due to screening from vegetation and built infrastructure, although from locations adjacent to the castle, there are views available in the direction of the proposed turbines.	Yes
Mooghaun Hill Fort	Bronze-Age hill fort located in Co. Clare. It is a well-preserved, recently excavated site, occupying the entire hill. It is believed to be the largest hill fort in Ireland and is one of the region's main tourist attractions.	There is full theoretical visibility on the eastern side of the hill, with no theoretical visibility on the western side.	Actual visibility of the proposed turbines is unlikely to occur due to the wooded nature of the hill and the surrounds of the hillfort.	No
King John's Castle	Also known as Limerick Castle, this is a 13th-century castle located on King's Island in Limerick, Ireland,	Partial theoretical visibility.	There will be views of the proposed turbines that occur form elevated turrets and locations	Yes

Tourist Destination	Description	Theoretical Visibility	Actual Visibility	Scoped in for Assessment?
	next to the River Shannon.		along the castle walls.	
15-20km				
Glenstal Abbey and Castle	Abbey located in and beside Glenstal Castle, a Normanesque castle, designed as a castle in 12th century style. It was built in the 1830s.	No theoretical visibility.	No actual visibility.	No
Castlebawn Castle	Sixteenth-century tower house on a small island of Lough Derg on the River Shannon, connected to the shore of Bealkelly by a man-made causeway. It was built by the McNamaras in ~1540 and severely damaged in 1827, but is now restored, although public access is not permitted to the castle.	No theoretical visibility.	No actual visibility.	No

14.5.1.6 Transport Routes

Motorways, national primary and national secondary roads were identified within the LVIA Study Area. The visual baseline exercise determined that most visibility of the proposed turbines will occur within 5km of the proposed turbines. Therefore, regional roads within 5km were included in the visual baseline exercise. Regional roads and local road transport routes within 3–5km (3km in the case of local roads and 5km in the case of regional or national roads) of the proposed turbines were also assessed as part of the RSA included in Section 14.3.3 'ZTV versus Actual Visibility'.

Table 14-14 below lists the transport routes and geographical extent of theoretical visibility upon each section of the identified transport routes as illustrated in the ZTV and Visual Baseline map (Figure 14-19). On-site appraisals determined that in most instances where ZTV mapping has indicated full theoretical visibility, there will actually be limited visibility from large portions of these routes due to local topography and roadside screening. For the purpose of viewpoint selection, certain locations on these transport routes were identified where the most open visibility is likely to occur.

Table 14-14 Major Transport Routes within the LVIA Study Area

Transport Route	Theoretical Visibility	Scoped in for Assessment?
Up to 5km		
R465	Mostly full and partial theoretical visibility between 5–15km from the proposed turbines.	Yes
R466	Mostly full and partial theoretical visibility between 5–10km from the proposed turbines.	Yes
R471	Mostly full theoretical visibility within the 5km of the proposed turbines.	Yes
5 to 10 km		
N18	A mix of partial and full theoretical visibility to the southwest of the proposed turbines, primarily between 10–15km from the nearest proposed turbines.	Yes
10 to 15 km		
M7	Large stretches of theoretical visibility of the proposed turbines from along this route, located to the southeast of the proposed turbines.	Yes
M18	A mix of full, partial, and patches of no theoretical visibility along this route, which passes to the west of the proposed turbines.	Yes
M20	Large stretches of theoretical visibility of the proposed turbines from along this route, located to the south of the proposed turbines.	Yes
N24	Primarily full theoretical visibility of the proposed turbines along the part of this route within the LVIA Study Area.	Yes
N69	A mix of partial and no theoretical visibility along the part of this route within the LVIA Study Area. Given the distance from the site and the low levels of theoretical visibility indicated, there are unlikely to be substantial views of the proposed turbines along this route and no potential for significant visual effects.	No
N19	Primarily full theoretical visibility of the proposed turbines along the part of this route within the LVIA Study Area.	Yes
15 to 20 km		
N85	Primarily full theoretical visibility of the proposed turbines along the part of this route within the LVIA Study Area. However, given the distance of the route from the proposed turbines and the level of screening existent within the	No

Transport Route	Theoretical Visibility	Scoped in for Assessment?
	landscape, there are unlikely to be substantial views of the proposed turbines and no potential for significant visual effects.	

14.5.2 Visual Receptor Preliminary Analysis

After identifying the visual receptors in the study area based on designated scenic routes, settlements, recreational routes, recreational, cultural heritage and tourist destinations, OSi viewing areas and transport routes, a preliminary assessment was carried out to scope out visual receptors that will not be impacted by the Proposed Development.

ZTV mapping and visibility appraisals conducted on-site during surveys undertaken in 2022 and 2023 were used to scope out visual receptors from further assessment. In the case of the visual receptors shown below in Table 14-15, views towards the turbines were either entirely screened or substantially screened from view. In some cases, the factor of distance to the Wind Farm Site as well as the directional focus of views was included in the preliminary analysis and was a contributing factor precluding these locations being selected as viewpoints.

*Table 14-15 Visual Receptors **Scoped Out** from Further Assessment*

Visual Receptor Category	Visual Receptor with no theoretical visibility from ZTV mapping (or view focussed away from the proposed turbine)
Designated Scenic Routes and Views	〉 C SR-23 〉 C SR-27 〉 C SR-32 〉 T SR-44 〉 C SR-28 〉 T SR-55 〉 T SR-59
OSi Viewing Areas	〉 View from the end of Cratloe Wood Forest Park Walking trail in the townland of Brickhill East 〉 View along the R463 near Ogonnelloe in the townland of Caher. 〉 View along the Graves of the Leinster Men Looped Walk West of the Millennium Cross Trailhead, in the townland of Coolbaun. 〉 View along T SR-44 along the R494 in the townland of Townlough Lower. 〉 Lookout point on T SR-44 along the R494 regional road in the townland of Castletown.
Settlements	〉 New Kildimo 〉 Patrickswell 〉 Murroe 〉 Scarriff / Tuamgraney 〉 Clarecastle 〉 New Market-on–Fergus 〉 Killaloe

	〉 Kilbane 〉 Ardnacrusha 〉 Doora 〉 O'Gonnelloe 〉 Bodyke 〉 Cratloe 〉 Meelick
Recreational Routes	〉 Ballyhourigan Woodland Walk 〉 Murroe Nature Loop and Clare Glens Loop 〉 Nenagh Cycle Hub Loop 2 〉 Ballinruan Loops - Gortnamearacaun Loop 〉 Ballycuggaran – Crag Wood Walk 〉 O'Briensbridge – Errinagh Bridge 〉 O'Briensbridge – Old Barge Loop 〉 Killoscully Mass Path Trail
Recreational, Cultural Heritage and Tourist Destinations	〉 Castlebawn Castle 〉 Glenstal Abbey and Castle 〉 Mooghaun Hill Fort 〉 Craggaunowen History Museum 〉 Knappogue Castle
Transport Routes	〉 N69 〉 N85

Following the pre-assessment exercise, the visual receptors shown below in Table 14-16 have been selected for assessment due to their prominence within the LVIA Study Area and the potential visual effects they may experience due to the Proposed Development. Photomontage imagery was captured to represent almost all of the receptors scoped in for assessment (See receptors in the Table below) following this initial scoping exercise.

All photomontage imagery captured from all viewpoints for this LVIA (a total of 44 No. viewpoints) were progressed to a draft stage – 'Photowires' (See Definition in Section 1.5.5 of Appendix 14-1). A selection of 16 No. Viewpoints were then selected for inclusion in the *Photomontage Booklet,* which includes assessment of cumulative effects with other wind energy developments. The viewpoints selected for the *Photomontage Booklet* represent the most sensitive receptors where open visibility of the proposed turbines occur and provide a good geographical spread of views surrounding the site. In many instances, viewpoints were not progressed from Photowire stage as the proposed turbines are almost entirely screened from view. Or else, photowires might not have been selected for the final *Photomontage Booklet* as another nearby viewpoint was felt to be a better representation of views from receptors in a particular area, or represented a greater number of sensitive receptors. All Photowires are included in Appendix 14-5, Prefixed by the term 'PW' in the table below. All viewpoints included in the *Photomontage Booklet* are prefixed by a 'VP' in the table below.

*Table 14-16 Visual Receptors **Scoped In** for Assessment*

Visual Receptor	Description	Viewpoint (VP) or Photowire (PW) No.
Designated Scenic Routes and Views	C SR-22	VP3
	C SR-24	VP14
	C SR-25	VP4

	C SR-26	PWB, PWC
	T SR-57	PWP, PWQ
	C SR-21	VP9
	L SR-1	PWP, PWQ
OSi Viewing Area	View from Tountinna Mountain on the Arra Mountains loop, in the townland of Killary.	PWM
Settlements	Broadford	VP1
	Kilkishen	VP16, PWK
	Bridgetown	VP15, PWO
	O'Briensbridge	VP15, PWO
	Cloonlara	PWO
	Sixmilebridge	VP8
	Kilmurry	VP8, PWK
	Castleconnell	VP5, PWO, PWP, PWQ
	Tulla	VP14, PWW
	Parteen	VP6, PWS
	Clooney	PWW
	Athlunkard	VP6, PWR, PWS
	Quin	PWW
	Bunratty	VP9, PWY
	Feakle	VP11
	Shannon	VP9, PWY
	Limerick	VP5, VP6, PWR, PWT, PWS, PWZ
	Newport	PWP, PWQ
Recreational Routes	East Clare Way	VP1, VP10, VP11, PWA, PWN, PWI, PWAC, PWAB
	12 O'Clock Hills Looped Walks	VP12, PWX

	Lough Derg Way	VP15, PWT, PWZ, PWO, PWM
	O'Briensbridge – Parteen Weir	VP15
	Mid Clare Way	PWW, VP9
	Graves of the Leinster Men Looped Walk	PWM
	Arra Mountains Loop	PWM
Recreational, Tourism and Cultural Heritage Destinations	King John's Castle	VP6, PWZ
	Bunratty Castle and Folk Park	PWY, VP9
Transport Routes	R465	VP1, VP4, VP15, PWE, PWD, PWF
	R466	VP4
	R471	VP2, VP15, PWV
	N18	VP9, PWY
	M7	VP5
	M18	VP9
	M20	VP6, PWR
	N24	VP5
	N19	VP9

Photomontages and Photowires

Imagery was captured from 44 No. viewpoints. These are presented in the following documents:

- 16 No. Viewpoints Selected for including in the **Volume 2 Photomontage Booklet** – which includes 'Cumulative Views' – photomontages with other existing, permitted and proposed wind energy developments rendered into photomontages and wireline views.
- 28 No. Photowires (draft, early stage photomontages) are presented in Appendix 14-5.

14.5.3 Visual Amenity and Residential Receptors

During multiple surveys conducted in 2022 and 2023, visibility appraisals determined that most visibility of the proposed turbines will occur within 5km of the proposed turbines. This area is modified 'Working' and 'Settled' landscapes with residential housing organised along the local road network, as well as small settlement clusters around local crossroads and junctions. Some residential receptors located in close proximity to the Wind Farm Site will likely have views of the proposed turbines and are likely to have the greatest visual effects arising as a result of the Proposed Development. Several

photomontage viewpoint locations representing residential properties located in close proximity to the proposed turbines were selected for inclusion in the *Photomontage Booklet* and are assessed in Appendix 14-3: *Photomontage Assessment Tables* and discussed later in this chapter. The following representative viewpoints are located in proximity to residential receptors and settlement centres within 5km from the proposed turbines.

- VP1 – Broadford in the townland of O'Shea's Acres;
- VP2 – townland of Derryvinnaan;
- VP3 – townland of Clogga;
- VP7 – townland of Cloontra;
- VP10 – townland of Snaty (Cooper);
- VP13 – townland of Drumsillagh or Sallybank (Peter);
- VP15 – townland of Tooreen;
- VP16 – townland of Belvoir.

As well as the above photomontage viewpoints, which can be seen in the *Photomontage Booklet*, there are 17 no. additional photowires shown in Appendix 14-5 'Photowire Booklet', located within 5km of the nearest proposed turbine. The impact of the proposed turbines on residential visual amenity is discussed in detail in Section 14.7.3.3.4 'Residential Visual Amenity'.

14.6 Cumulative Context

The purpose of this section is to identify all wind farm developments in the LVIA Study Area which potentially contribute to assessment of cumulative and in combination landscape and visual effects. This chapter assesses the likely landscape and visual impacts of the Proposed Development, both independently, as well as in combination with all other existing and operational wind farm developments in the LVIA Study Area. This chapter also assesses the Proposed Development in combination with the 'likely future receiving environments' according to the EPA (2022), which includes all permitted and proposed wind farm developments in the LVIA Study Area.

Overall, the landscape of the site and its wider setting is a highly suitable area for the development of wind energy; consequently, a variety of projects exist within differing stages of the wind farm life cycle (existing, permitted and proposed). All wind farm developments in the LVIA Study Area are identified in this section and each is within one of the following categories:

- **Existing** – Existing wind energy developments currently operational in the baseline landscape at the time of conducting this LVIA;
- **Permitted** – Permitted wind energy developments, permitted (consented) at the time of conducting this LVIA. These developments have a high probability of being operational in a future receiving landscape;
- **Proposed** – All well-developed wind farm proposals with project specifications in the public domain at the time of conducting this LVIA. This includes proposed projects currently lodged into planning and projects at pre-planning stage. Cumulative effects between the Proposed Knockshanvo Development and other proposed developments within this category are more uncertain and are reliant on the outcome of the planning and consenting system.

These categories are a useful guide to enable understanding and structure when viewing the *Photomontage Booklet* and identification of developments in this section. However, irrespective of how a development is categorised, the assessments of cumulative landscape and visual effects includes all wind farm developments.

In terms of cumulative landscape and visual effects, other wind energy projects are of primary focus, as only these would be described as very tall vertical elements in the landscape and therefore have the greatest potential to give rise to significant cumulative effects. Other wind energy developments within

20km of the Proposed Development were identified by searching past planning applications lodged through the various planning authorities online planning portals (Please refer to Chapter 2). The information identified in the initial planning search was then used to verify, by means of a desk-based study and ground-truthing, whether the permitted wind energy developments had been constructed. The list of existing, permitted and proposed wind turbines present within the LVIA Study Area are listed below in Table 14-17.

Table 14-17 Other Wind Farms Identified within the LVIA Study Area

Other Wind Farms	Status	No. of Turbines	Distance to the nearest turbine of another development from the nearest proposed Knockshanvo turbine
Up to 5km			
Oatfield	Proposed	11	Approx. 500m.
Fahy Beg	Permitted	8	4.3km
Ballycar	Proposed	12	4.8km
5 to 10km			
Lackareagh	Proposed	8	5km
Carrownagowan	Permitted	19	5.7km
Parteen	Existing	1	8.8km
10 to 15km			
Vistakon	Existing	1	12.1km

Two existing single turbines (Parteen & Vistakon), two permitted wind farms, and three proposed wind farms are existent within a 20km radius of the proposed turbines. The locations of the 7 No. wind farms can be identified on the Cumulative Context Map below (Figure 14-20). If the turbines are theoretically visible, all turbines are included within the photomontage imagery in the *Photomontage Booklet*.

14.6.1 Presentation of Cumulative Wind Farms in the Photomontage Booklet

A description of how the various cumulative categories (existing, permitted and proposed) are presented in the *Photomontage Booklet* is reported below and in Section 1.5.3 'of Appendix 14-1: *LVIA Methodology*. All existing turbines are presented in the 'Existing View' and accompanying wireline. The Proposed Development turbines are then presented in the 'Proposed Knockshanvo' view with an accompanying wireline. Then, to account for and address potential cumulative effects, a 'Proposed View with Cumulative' view is shown with a matching wireline which includes the Proposed Development as well as all other existing, permitted and proposed turbines which could potentially occur in a future receiving environment.

The following page layouts are included in the *Photomontage Booklet* as follows:

1. **Overview Sheet –** Viewpoint details include location description, grid reference, distance from nearest turbine and technical data in relation to photography. Three

maps at various scales show the viewpoint location. A 120-degree existing-view image without any proposed and permitted turbine is called the 'Key Image'. Existing turbines visible in the landscape may appear within this image, and the horizontal extent of the 90-degree and 53.5-degree image to be presented in subsequent images is also framed;

2. **Existing View at 90° –** A 90-degree visual baseline image without any proposed or permitted turbines and a matching wireline image of the same view which includes any existing turbines visible in the landscape. If turbines are already existing in the landscape, these will be visible on the photograph and are rendered in the wireline view;
3. **Proposed Knockshanvo Photomontage at 90°** – A 90-degree photomontage image with the proposed wind farm and all other existing wind farms within the view. A matching wireline image shows the turbines of all proposed Knockshanvo turbines and existing wind farms individually coloured and labelled for ease of identification;
4. **Proposed Knockshanvo Photomontage at 53.5°** –A photomontage image of the proposed Knockshanvo turbines and any existing turbines in a 53.5-degree horizontal field of view;
5. **Proposed Knockshanvo Wireline at 53.5°** - A wireline image of the proposed Knockshanvo turbines and any existing turbines in a 53.5-degree horizontal field of view. The Proposed Development turbines and any other existing wind farms are individually labelled for ease of identification.
6. **Proposed Photomontage with Cumulative at 90°** – A 90-degree photomontage image with the proposed wind farm and all other existing, permitted and proposed wind farms within the view. A matching wireline image shows the turbines of all proposed, permitted and existing wind farms individually coloured and labelled for ease of identification;
7. **Proposed Photomontage with Cumulative at 53.5°** –A photomontage image of the proposed turbines and any existing, permitted and proposed turbines in a 53.5-degree horizontal field of view;
8. **Proposed Wireline with Cumulative at 53.5°** - A wireline image of the proposed turbines and any existing and permitted turbines in a 53.5-degree horizontal field of view. The Proposed Development turbines and any other existing, permitted and proposed wind farms are individually labelled for ease of identification.

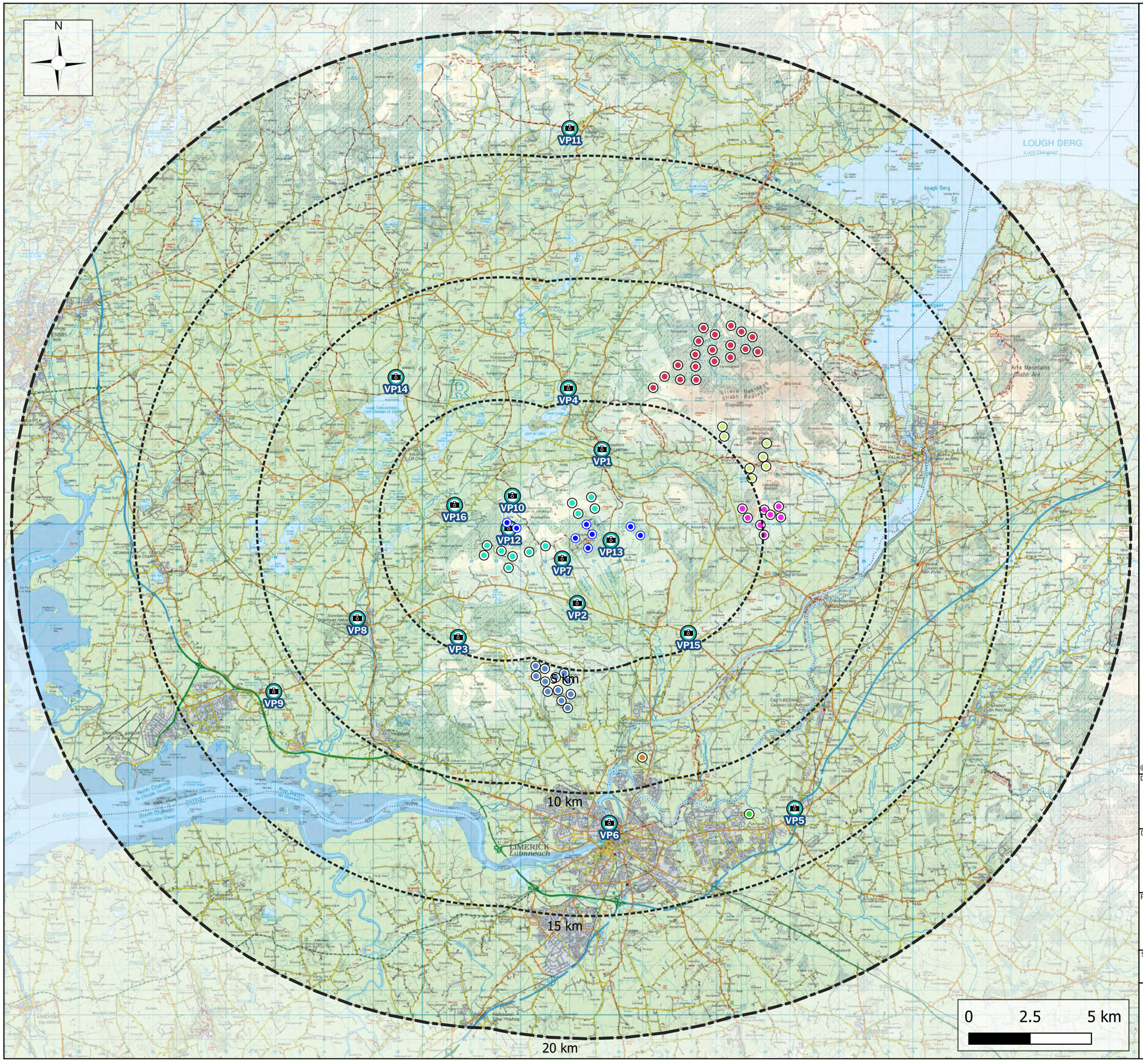
14.6.2 Assessment of Cumulative Landscape and Visual Effects

The effects reported both in this chapter and within the assessment appendices (Appendix 14-2: *LCA Assessment Tables*; Appendix 14-3: *Photomontage Assessment Tables*) uses appropriate and logical narrative to discuss cumulative interactions between the Proposed Development and all other wind energy developments irrespective of which category (Existing; Permitted; Proposed) they occur in. Discussion of cumulative interactions on specific landscape and visual receptors is relative to the effects on that receptor and proportionate to the likelihood of significant landscape and visual effects occurring. Discussion and the impact assessments also consider the probability of such cumulative effects arising in mind of the category of the other developments with which the Proposed Development interacts, meaning 'Existing', 'Permitted' or 'Proposed'.

Assessment of cumulative landscape and visual effects need to be proportional. The focus is on the extent to which the Proposed Development will contribute towards the cumulative effects on the particular receptors under assessment, these contributions are clearly explained in narrative in the cumulative impact assessments included in this Chapter (Sections 14.7.3.2 and 14.7.3.4), as well as the impact assessment Appendices (Appendix 14-2 and Appendix 14-3).

An assessment of cumulative landscape and visual effects are included in the assessment of effects detailed below in Section 14.7 'Likely Significant Landscape and Visual Effects' of this Chapter.

ZTV mapping is another useful tool for analysing the potential for cumulative landscape and visual effects. A cumulative ZTV map is presented in Figure 14-21 below, showing the collective theoretical visual exposure of all existing permitted and proposed wind energy developments in the LVIA Study Area. Figure 14-21 also illustrates the areas (in green) where only the Proposed Development is theoretically visible, comprising several small areas to the west and north of the Western Cluster of turbines.



Map Legend

- LVIA Study Area
- Proposed Turbines
- Photomontage Viewpoint Locations Volume 2 Booklet

Other Existing, Permitted and Proposed Wind Farms in the LVIA Study Area

- Existing Parteen Turbine
- Existing Vistakon Turbine
- Permitted Carrownagown Wind Farm
- Permitted Fahy Beg WF
- Proposed Lackareagh WF
- Proposed Ballycar Wind Farm
- Proposed Oatfield WF

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Drawing No.

Figure 14-20

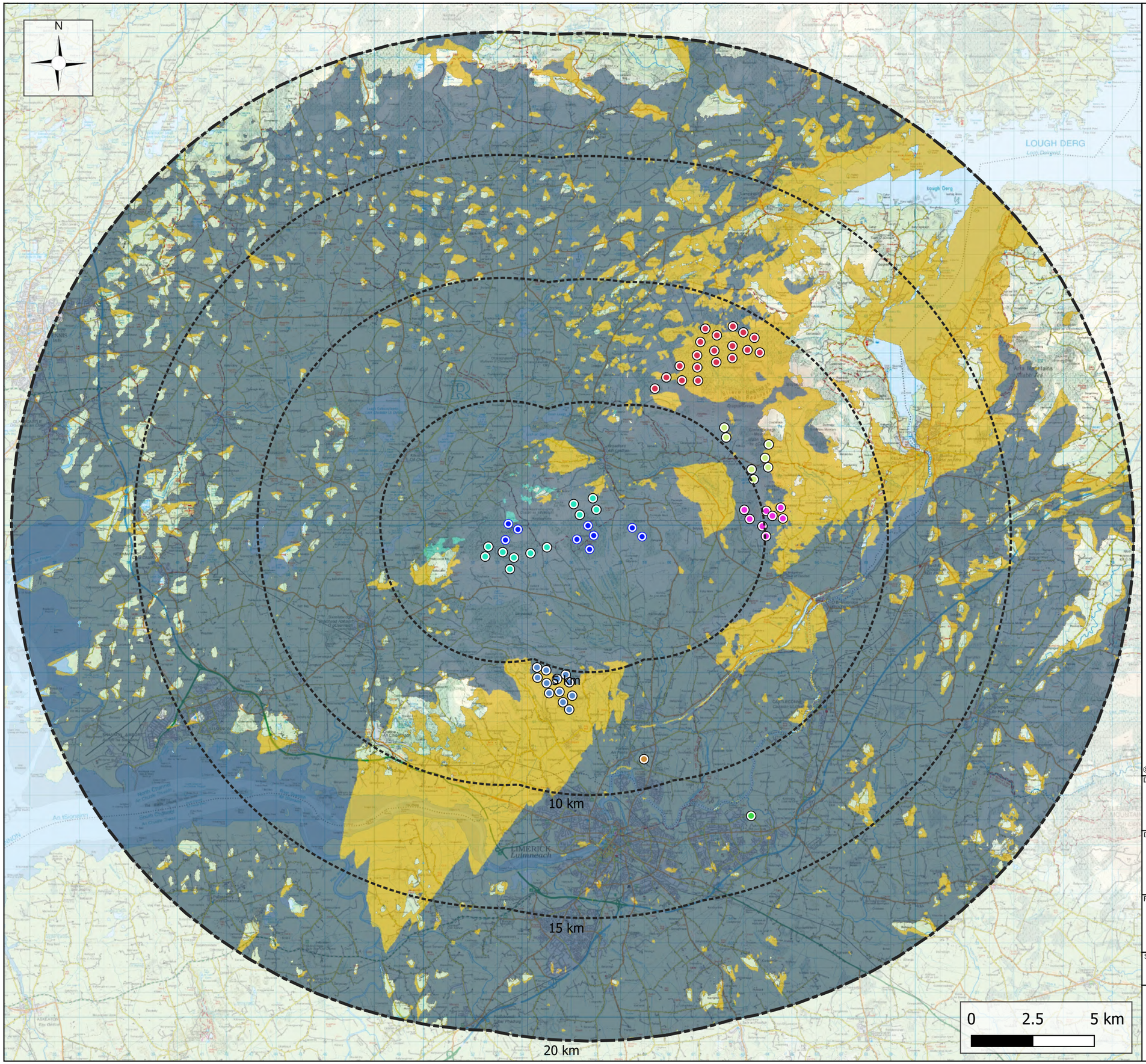
Drawing Title

Cumulative Context Map

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	19.04.2024	JW	JS



Map Legend

- LVIA Study Area
- Proposed Turbines

Cumulative ZTV Map

- Theoretical Visibility of the Proposed Development Only
- Theoretical visibility of other Existing, Permitted and Proposed Wind Energy Development - No theoretical visibility of The Proposed Development
- Theoretical visibility of the Proposed Development and all other Wind Energy Developments (Existing, Permitted and Proposed) in the LVIA Study Area

Other Existing, Permitted and Proposed Wind Farms in the LVIA Study Area

- Existing Parteen Turbine
- Existing Vistakon Turbine
- Permitted Carrownagown Wind Farm
- Permitted Fahy Beg WF
- Proposed Lackareagh WF
- Proposed Ballycar Wind Farm
- Proposed Oatfield WF

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Drawing No.

Figure 14-21

Drawing Title

Cumulative ZTV Map

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	19.04.2024	JW	EOS

14.6.3 Proposed Oatfield Wind Farm

The proposed Oatfield Wind Farm is sited in very close proximity to the Proposed Development. The proposed Oatfield turbines are sited upon the same elevated landform as the Proposed Development, and as demonstrated by the photomontage visualisations, they are often likely to be seen within the same visual unit as the proposed Knockshanvo turbines which are the subject of this planning application and assessment in this chapter. As shown in the map below, the proposed Oatfield turbines are separated into two turbine clusters. Four No. Oatfield turbines are sited north of the Knockshanvo Central Cluster of turbines and 7 No. Oatfield turbines are sited south of the Western Cluster.

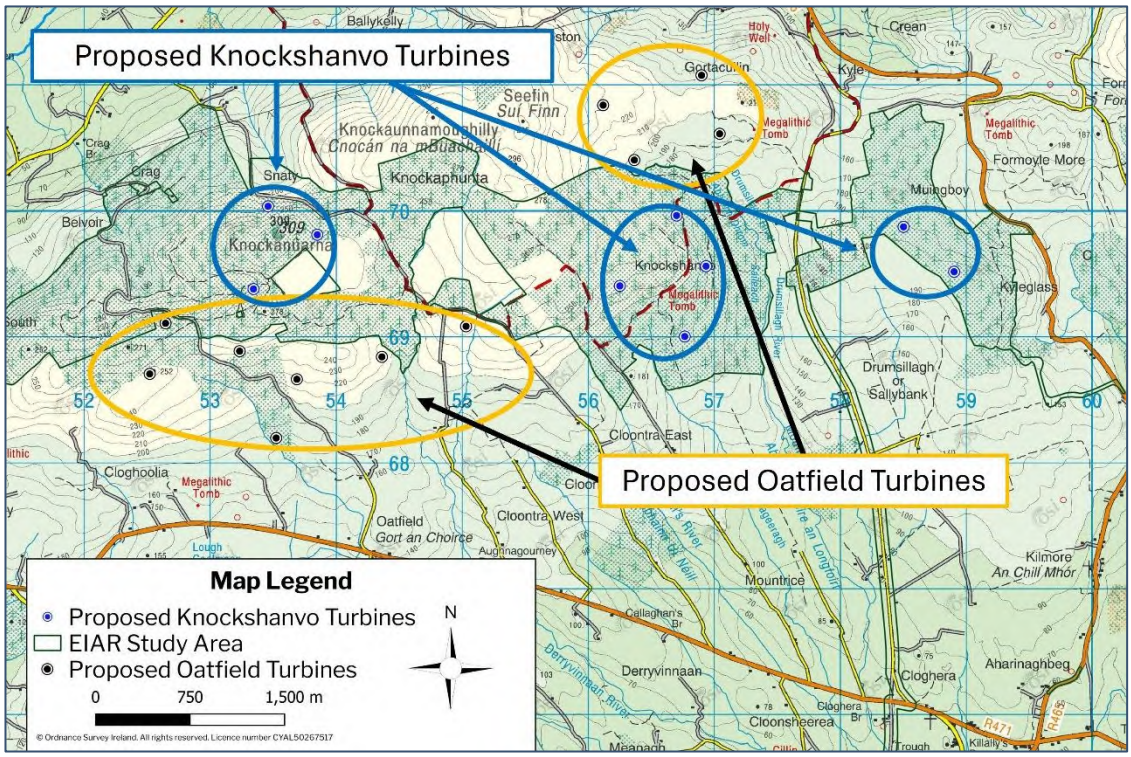


Figure 14-22 Proposed Oatfield Turbines and the Proposed Knockshanvo Development

There is a degree of uncertainty as to whether other 'proposed' developments such as the Oatfield Wind Farm will be present and seen within the landscape in combination with the proposed Knockshanvo turbines in a future receiving environment, a probability that is reliant on the consenting process and many other factors post consent such as successful grid connection offers being forthcoming from the System Operator(s), success in Renewable Energy Support Scheme auctions, etc., that may influence their construction beyond successful planning permission. In order to provide clarity for both the assessor and reader, two separate 'proposed views' are presented in the *Photomontage Booklet* to enable independent assessment of the Proposed Knockshanvo Development within the landscape in and of itself (without other proposed developments such as Oatfield where there is a large degree of uncertainty around their presence in the landscape, i.e. the 'Proposed Knockshanvo' view). The secondary 'Proposed View with Cumulative' is also presented, enabling clear illustration of the proposed turbines in combination with the proposed Oatfield development and the other permitted and proposed developments in the wider area.

14.7 Likely Significant Landscape and Visual Effects

A comprehensive description of the guidance and methodology used for the assessment of landscape and visual effects are included in Appendix 14-1. Appendix 14-1 also includes information about the tools such as photomontages which are used to inform the impact assessment, including their limitations (Section 1.5.2 of Appendix 14-1 *Limitations of Photomontages*).

Section 14.7.4 addresses the likely difference of effects arising from the proposed turbine range, including analysis of three different turbine models from four photomontage viewpoints. This analysis concludes that: irrespective of the turbine model implemented within the range proposed, the outcome of the significance of residual landscape and visual effects on receptors will not change.

14.7.1 Do-Nothing Scenario

If the Proposed Development was not developed, the landscape of the Wind Farm Site and Grid Connection will continue to function as they do at present, with no changes made to the current land-use of coniferous forestry, biodiversity areas under Coillte management and third-party lands currently being used for agricultural and forestry on the Wind Farm Site and public road corridor and coniferous forestry along the Grid Connection. The effect of this is considered neutral in the context of the EIAR. If the Proposed Development were not to proceed, the opportunity to capture an even greater part of County Clare's valuable renewable energy resource would be lost, as would the opportunity to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. Should the Proposed Development not proceed, the landscape and visual impact will be neutral in the context of this EIAR.

14.7.2 Construction Phase Effects

It is estimated that the construction phase of the Proposed Development will last between 18-24 months – Short-Term (EPA, 2022). The construction of the development will involve the construction of 9 No. turbines with a maximum blade tip height of 185m and all associated works, and a 110kV on-site substation and associated works, including underground cabling. Construction phase effects also include the associated effects resulting from the movement of construction and turbine transport vehicles into and out of the Proposed Development Site, to allow the construction of the turbines, roads, and associated elements.

All landscape and visual effects during the construction phase are deemed to be short-term and negative. The same mitigation will be applied regardless of the turbine model implemented within the range to ensure no difference of landscape and visual effects during the construction phase.

14.7.2.1 Landscape Effects (Construction Phase)

The earthworks such as cut, and fill required to facilitate the construction of the Proposed Development will have a direct effect on the landscape and have the greatest potential for landscape effects. Where excavation is required, the existing landcover, vegetation and spoil will be removed during the construction phase. In most instances, groundworks and excavation trenches will be re-installed upon the completion of construction. Excavation will be visually contained by the surrounding landform and will not be visible from the wider LVIA Study Area. The construction activities may potentially cause temporary impacts on the landscape such as the creation of temporary structures, dust and noise. In general, it is considered that the construction phase will have a **'Short-Term, Moderate, Negative'** effect in terms of direct landscape effects.

In the case of the Proposed Development, the construction works will be temporary/short-term in nature and completed as soon as practically possible. All construction activities will follow best practise methods to reduce impacts upon the environment and landscape of the Proposed Development Site.

Further details are set out in the Construction and Environmental Management Plan (CEMP) contained in Appendix 4-3 of this EIAR.

14.7.2.2 Visual Effects (Construction Phase)

The most substantial visual effects will arise from requisite construction activities such as building the tower sections and erecting the turbines. These will be temporary scenarios during the construction phase where the proposed turbines will be partially constructed and may be seen as either standalone tower sections, or incomplete turbines where only one or two blades are visible. The equipment and vehicles required to transport and erect the wind farm components include large cranes and large haulage vehicles. These construction activities will cause **'Slight, Short-Term, Negative'** visual effects.

General housekeeping measures, necessary for health and safety requirements, will be implemented to ensure that the active construction areas will be kept tidy, mitigating localised visual impacts during the construction phase. A detailed description of the Proposed Development is included in Chapter 4 of this EIAR. The following sections assess the visual effects associated with the construction phase of the other (non-turbine) components of the Proposed Development.

14.7.2.3 Ancillary Project Elements (Construction Phase)

14.7.2.3.1 *Site Access Roads and Hardstand Areas*

The proposed access roads and hardstand areas are flat features and will be most visible within their immediate surroundings, within the Wind Farm Site, hence no 'Significant' impacts will arise within the landscape. Every use will be made of the existing farm and access tracks on the site. Some tracks shall be upgraded appropriately whilst several stretches of new internal roads shall need to be newly constructed. The landscape and visual impact of the construction of these flat and hard surfaces will be extremely localised. Thus, the visual effects arising from the access roads and hardstand areas are considered to be localised, **'Slight and Short-Term'**.

14.7.2.3.2 *Turbine Delivery Route (TDR) Accommodation Works*

As detailed in Section 4.2.11.2 of Chapter 4, works are required along proposed turbine transport routes to accommodate the large vehicles used to transport turbine components to wind farm sites. In some instances (See Section 4.2.11.2), minor temporary alterations will be required to the existing streetscape, temporary local road widening, overruns of roundabout island and temporary relocation of some signs and street furniture. Full details of the assessment are included as part of the traffic impact assessment set out in Chapter 15: 'Material Assets' of this EIAR.

As detailed in Section 4.2.11.2 of Chapter 4, small areas of hedgerow and trees may need to either be removed or trimmed at several locations. The landscape value and sensitivity of the site of the TDR accommodation works are deemed to be **Low** and the change to occur will be highly localised. These works are likely to cause **'Not Significant, Temporary, Negative'** landscape and visual effects.

14.7.2.3.3 *Temporary Transition Compound*

A Temporary Transition Compound (TTC) is proposed adjacent to the N69 National Road west of Ferrybridge in Co. Limerick. This TTC is required as a space to transfer turbine blades from large haulage vehicles to other vehicles suitable for navigating the smaller roads of the Slieve Bernagh Uplands. The TTC comprises three fields of flat agricultural grassland (See drone image previously in Section 14.4.2). Construction of the TTC will involve some minor vegetation removal and re-surfacing with gravel hardstanding. Most of the mature boundary vegetation will be retained (excepting entrance and egress locations) enclosing the TTC and reducing visibility from receptors in the surrounding landscape which is very flat. The landscape of this compound area is deemed to be 'Low' sensitivity and changes will be mainly surface level and will be highly localised. The compound is not likely to be

seen by any high sensitivity visual receptors. **'Not Significant, Temporary, Negative'** landscape and visual effects are likely to arise.

14.7.2.3.4 Proposed Borrow Pits

It is proposed to construct 5 No. temporary borrow pits within the Wind Farm Site. The extraction of material from the borrow pits is a construction phase activity only, conducted through means of rock breaking and blasting. The effects of the borrow pits will be highly localised and the landscape value and sensitivity of the site of the borrow pits are deemed to be **Low**. These works are likely to cause **'Not Significant, Temporary, Negative'** landscape and visual effects. In addition, mitigation factors are implemented post-construction phase, where the borrow pits are to be backfilled with excavated spoil and then reseeded or left to vegetate naturally.

To manage any excess overburden generated through construction activities, peat storage areas have been selected within areas suitable for spoil management. The effects of peat storage areas will be highly localised within the Site; therefore, the creation of peat storage areas will have a **'Temporary, Imperceptible'** effect on the landscape.

14.7.2.3.5 Meteorological (Met) Mast

One No. met mast is proposed as part of the Proposed Development. This shall be a slender structure 105m in height, and will not be an imposing structure in terms of visual impact. The landscape and visual effects of the construction of the proposed mast will be highly localised, considering that construction activities related to this will be most visible within the immediate surroundings. Within the Site and its immediate landscape setting, the landscape and visual effects arising from the construction of the met mast are considered to be of highly localised **'Slight, Short-Term, Negative'** effects.

14.7.2.3.6 Proposed 110kV Substation

Visual effects will occur as the proposed substation is built due to the earthworks and requisite construction activities; these will cause a 'Substantial' but highly localised magnitude of change to views in the immediate area. As established in the baseline investigations, the proposed substation is located within commercial forestry with a large set-back distance from the nearest residential receptor, located approx. 280m west of the proposed substation). Visibility of the substation will be limited from this receptor due to the screening effect from the vegetation enclosing the boundary of the property and in the intervening space (i.e. commercial forestry). There are a number of other residential receptors located in relatively close proximity to the proposed substation, with substantial levels of visual screening in the landscape between these receptors and the substation, predominantly in the form of hummocky topography and treelines. Therefore, the visual effects are likely to be highly localised, **'Negative, Short-Term and Slight'**.

14.7.2.3.7 Grid Connection – Underground Electrical Cabling Route and Connection to the National Grid (Construction Phase Effects)

It is proposed to connect the substation to the existing Ardnacrusha 110kV substation, located approximately 7.7km south of the site. Connection via the Ardnacrusha route shall comprise underground cabling, measuring approximately 9.2km in total, located within the public road corridor and forestry tracks for the entirety of the route. The path of the route can also be seen on Figure 4-1b in Chapter 4 of this EIAR. The underground electrical cabling route will be located underground, therefore the greatest effects attributed to this element of the Proposed Development will occur during the construction phase. The underground electrical cabling route works are to be carried out along existing public road corridors and within private commercial forestry. The construction phase of the underground electrical cabling route will be short-term, localised, and transient in nature, as the works shall relocate incrementally along the cabling route. The works will include roadside vegetation removal, soil/road surface stripping, excavation, and other associated construction activities. Regarding

the Grid Connection, changes will be localised to the immediate environment surrounding the Grid Connection and shall not permanently affect the character of the landscape setting or visual amenity of the wider area. Therefore, the proposed Grid Connection underground electrical cabling works are likely to cause '**Slight, Temporary, Negative'** landscape and visual effects.

The following measures will be implemented to mitigate effects during the construction phase and operational phase of the Grid Connection underground electrical cabling route and line break:

- In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used;
- Where the cable trench is to be located in the road verge, subsoil will be piled on-site and re-used after cabling works. Should any medium planting be removed, it will be replaced with the same or similar species in cases where it is not possible to salvage and reinstate the original plants;

14.7.3 Operational Phase Effects

14.7.3.1 Landscape Effects (Operational Phase)

14.7.3.1.1 *Landscape of the Wind Farm Site*

The landscape of the Wind Farm Site will undergo substantial changes in the landscape by the introduction of vertical man-made structures within the landscape of the Site. The footprint of the proposed turbines and ancillary infrastructure comprises 7.18ha of area within the EIAR Site Boundary at the Site. There will be a 'Substantial' magnitude of change to the landscape in localised areas within the site where the landscape is materially altered (infrastructure footprint).

As reported in this chapter, the Wind Farm Site is located in a modified upland landscape designated as a 'Strategic Area' for wind energy development in local planning policy, and commercial forestry is the dominant landcover and land use. The 12 O'Clock Hills Waymarked Walking Trail and lookout point adds some local recreational value to the Site. On balance, the landscape value and sensitivity of the Wind Farm Site was deemed to be Low (recall Section 14.4.2.2 'Landscape Value and Sensitivity of the Proposed Development Site'). Thus, a 'Low' sensitivity balanced with a 'Substantial' magnitude of change amounts to long-term landscape effects of **'Moderate'** significance upon the physical fabric of the landscape of the site (see Appendix 14-1: *LVIA Methodology*); these direct landscape effects shall be highly localised to the footprint of the Proposed Development. Effects on the perceptual and aesthetic character of the Site are also deemed to be Long term, Negative and of '**Moderate**' significance.

Mitigation of Landscape Effects within the Landscape of the Wind Farm Site

The following measures have been included in the Proposed Development design and will be implemented in order to avoid, reduce, mitigate or offset effects on landscape receptors of the Proposed Development Site:

- The spatial configuration of the proposed infrastructure footprint has been carefully designed to minimise the loss of valuable landscape receptors on the Site, such as peatland of high biodiversity value, intact bog, and features of cultural-heritage value;
- The proposed internal site road layout maximises the use of the existing forestry tracks wherever possible, to minimise the requirement for new tracks within the Site;
- In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible;
- The Proposed Development includes for plans to provide 2 No. new accessible viewing areas, an upgrade to an existing viewing area, and a new section of walking trail to offset effects upon the existing 12 O' Clock Hills amenity areas which

- contribute recreational value to the landscape of the Wind Farm Site. The existing trails are representative of Visual Receptors; therefore, effects of the Proposed Development on the existing amenity and the offsetting measures are comprehensively assessed and discussed below in Section 14.7.3.3.3: 'Discussion of Visibility and Visual Effects on Specific Visual Receptors in the LVIA Study Area'.
- A Biodiversity Management and Enhancement Plan (Appendix 6-5) is included as part of the Proposed Development. This includes measures such as creation of peatland habitats, 1.7km of linear vegetation planting as measures to bolster wildlife corridors and habitat connectivity within the Site;

Residual Landscape Effects

Once the Proposed Development is operational and construction activity is complete, the landscape will naturally re-vegetate around the Proposed Development footprint. Considering the mitigation measures above, residual effects upon the landscape of the Wind Farm Site are deemed to be **'Slight' Negative** and **Long-Term**.

14.7.3.1.2 *Effects on Landscape Receptors of High Sensitivity*

Several designated landscape receptors were identified in the landscape baseline as having 'High' sensitivity and some theoretical visibility indicated by ZTV mapping; the likely landscape effects on these receptors are discussed below. The Proposed Development will not directly alter the physical fabric of these landscape receptors and thus, any landscape effects are likely to impact only the character or setting. In all instances, there will be no 'Significant' impact on the sensitivities of these receptors due to the large set-back distances and limited visibility of the proposed turbines from them. Where appropriate, assessment of visual effects from these landscape receptors are discussed and reported below in Section 14.7.3.3 'Visual Effects (Operational Phase)'. All effects on landscape receptors discussed below are Long term and Negative.

County Clare 'Heritage' Landscape

Effects on several areas of Co. Clare 'Heritage' landscape were assessed. The following areas of 'Heritage' landscape identified in the LVIA Study area were assigned a sensitivity rating of 'High':

- Lough Derg and the Eastern Uplands; north and northeast of the LVIA Study Area;
- Fergus Estuary and River Shannon; southwest of the LVIA Study Area.

Lough Derg and the Eastern Uplands: ZTV mapping and on-site appraisals determined that the Proposed Development will have no impact upon this 'Heritage' landscape (in the LVIA Study Area), forming the western banks of Lough Derg. The 'Heritage' landscape of the Slieve Aughty Uplands is located approximately 17km north of the nearest proposed turbine. Theoretical visibility of the proposed turbines occurs on the southern slopes of the upland range as the landform rises to the north from the lowland plains comprising drumlin farmland. Whilst the proposed turbines will be visible in the background of views from elevated vantage points in the 'Heritage' landscape with south-facing aspects, they will only be visible as small background features of views at distances >17km (e.g., see VP11) and will bring about a 'Negligible' change to the setting and characteristics of this landscape receptor. The 'High' sensitivity combined with a 'Negligible' magnitude of change equates to a **'Long-Term and 'Slight'** landscape effect.

Fergus Estuary and River Shannon: One area of Co. Clare 'Heritage' landscape follows the northern bank of the River Shannon Rover and extends north towards the settlement of towards Sixmilebridge along the course of the Ratty River. This landscape is approximately 6.5km southwest of the Western Cluster at its closest point and ZTV mapping illustrates a mix of theoretical visibility in this area. Photomontage imagery was captured from several viewpoints in very close proximity to this landscape area in regions of full theoretical visibility. Photowire PWY (see Appendix 14-5) was captured near

Bunratty Castle, while photomontages VP9 northeast of Shannon Town and VP8 within Sixmilebridge are generally representative of areas with open views towards the proposed turbines from this part of the landscape. The visual effects of these receptors are assessed and discussed further in Section 14.7.3.3.3. This area of 'Heritage' landscape is deemed to be 'High' sensitivity on account of the designations in the CCDP as well as attributes and characteristics which provide cultural-heritage value. As shown by the photomontage visualisations, the proposed turbines are visible, but are partially screened beyond a distant hillside (generally at distances ranging from 6.5–12km), thus the magnitude of change on this landscape and its key sensitivities is deemed to be 'Slight'. The residual landscape effect is therefore deemed to be **Long-Term and 'Moderate'**.

One area of the Fergus Estuary designated as 'Heritage' landscape within the LVIA Study Area shows full theoretical visibility in proximity to Shannon Airport. However, visibility of the proposed turbines is likely to be far less than is indicated by ZTV mapping, given the distance and vegetated nature of this low-lying part of the landscape. The Proposed Development is not likely to have any impact upon the key sensitivities, characteristics or setting of this area of 'Heritage' landscape. In reality this area is of Low sensitivity with a Negligible magnitude of change and therefore effects are **Long Term** and **'Not Significant'**.

14.7.3.1.3 *Landscape Character Areas – Landscape Effects*

An assessment of the effects on landscape character was undertaken for the 10 No. designated LCAs within the 15km LCA Study Area for effects on landscape character that were identified as having potential for visibility of the proposed turbines in the previous Section 14.4.4.1: 'Landscape Receptor Preliminary Analysis'. The individual assessments for each LCA are summarised below in Table 14-18 and are detailed in Appendix 14-2: *Landscape Character Assessment Tables*. The assessment criteria and grading scales which aided the assessment of landscape effects are detailed in Section 1.6.1 'Assessing Landscape Effects' of Appendix 14-1: *LVIA Methodology*.

Table 14-18 LCA Assessment Summary

Designated Landscape Character Area	LCA Sensitivity to Wind Farm Development	Magnitude of Change	Significance of Landscape Effect (EPA, 2022)
C-LCA 8: Slieve Bernagh Uplands	Low	Moderate	**Slight**
C-LCA 9: River Shannon Farmland	Medium	Slight	**Slight**
C-LCA 10: Sixmilebridge Farmland	Medium	Slight	**Slight**
C-LCA 11: East Clare Loughlands	Medium	Slight	**Slight**
C-LCA 12: Tulla Drumlin Farmland	Medium	Slight	**Slight**
C-LCA 13: Ennis Drumlin Farmland	High	Negligible	**Slight**
T-LCA 12: River Shannon - Newport	Medium	Slight	**Slight**
L-LCA 6: Shannon ICZM	Medium	Slight	**Slight**

All effects in the table above and discussed below are **Long Term** and **Negative.**

Discussion of Landscape Effects on LCAs

A full and comprehensive analysis and assessment of each LCA is included in Appendix 14-2: *LCA Assessment Tables*. As shown above in Table 14-18, the Proposed Development will cause a 'Slight' magnitude of change in all assessed LCAs.

The largest magnitude of change will occur in the Slieve Bernagh Uplands where the majority of the Proposed Development and all turbines are sited. As reported in this chapter, this LCA is attributed a 'Low' sensitivity in mind of the policy designations in the CWES (see Table 4a in Section 4 of the CWES, and the previous Section 14.4.1.1.1) and the capacity of its upland landscape to accommodate large wind farms.

The Co. Clare LCA 13 – *Ennis Drumlin Farmlands* is the only LCA assessed which was deemed to be of 'High' sensitivity (according to the CWES). Considering the very limited extent of turbine visibility likely to occur from receptors in this LCA, the magnitude of change is 'Negligible' and therefore the residual effect is 'Slight'. Other 'High'-sensitivity LCAs, such as those in and around Lough Derg were scoped out in the preliminary analysis due to factors such as there being no areas of theoretical visibility shown by ZTV mapping, and therefore no impact.

A 'Slight' magnitude of change was deemed to occur in the remaining LCAs, which have some open visibility of the proposed turbines within the LCA in relative proximity. However, ultimately the changes have a relatively small impact upon the character of the LCA itself. These LCAs were deemed to be of 'Medium' sensitivity, resulting in a residual landscape effect of 'Slight'.

14.7.3.2 Cumulative Landscape Effects: Other Wind Energy Developments

The Co. Clare LCA 8 – *Slieve Bernagh Uplands* (where the Proposed Development is located) comprises all designated 'Strategic Areas' and 'Acceptable in Principle' areas for wind energy development in East Clare. Consequently, there are a number of other permitted and proposed wind energy developments in this LCA and the wider landscape setting of the Wind Farm Site.

As reported and mapped previously in Section 14.6: 'Cumulative Context', the permitted Carrownagowan Wind Farm is located to the north of this LCA, separated from the Proposed Development by 6km and several substantial landform features. The proposed Oatfield Wind Farm is located within the same localised upland area as the Proposed Development, with several Oatfield turbines located north of the Central Cluster and several Oatfield turbines south of the Western Cluster. The proposed Lackareagh Wind Farm and permitted Fahy Beg Wind Farm are both one ridgeline over in the Glenomra Valley to the east. The proposed Ballycar Wind Farm is one valley over to the south, also separated by well-defined and prominent ridgelines. Excepting Carrownagowan and Fahy Beg, all other developments are 'proposed' (Oatfield, Ballycar, and Lackareagh) and their likelihood of influencing cumulative effects on this LCA are reliant upon many factors, primarily including the outcome of the consenting system.

The proposed Oatfield Wind Farm development is discussed and identified previously in Section 14.6.3 'Proposed Oatfield Wind Farm'. The Oatfield development is located in the same area of upland as the Proposed Knockshanvo Wind Farm and therefore shall be seen within the same visual unit as the Proposed Development. Due to it's location within the same tract of upland landscape, it would contribute to cumulative effects on the physical fabric of this landform in combination with the proposed turbines in a potential future receiving environment. In this scenario, the undulating nature of the upland landscape would adequately accommodate both the proposed turbines of the Oatfield project in combination with all three turbine clusters of the Proposed Development. Cumulative effects on landscape character are likely to arise (in this uncertain future receiving environment) in cases where the Proposed Development is visible in combination with the Oatfield turbines, which would generally occur from most receptors in the landscape surrounding the site. The *Photomontage Booklet* effectively

illustrates the representative cumulative effects on the landscape character of this area. The visual effects of the Proposed Development in combination with the proposed Oatfield turbines (and other developments) are comprehensively analysed and discussed in representative photomontages in Appendix 14-3: *Photomontage Assessment Tables.* In general, the proposed Oatfield turbines increase the density of turbines upon the elevated ridgelines around the Central and Western Clusters of the Proposed Development.

All of the other wind energy developments in combination with the Proposed Development have the potential to contribute to cumulative landscape effects on the Slieve Bernagh Uplands LCA. However, this is to be anticipated considering the policy designations in local planning policy (recall Table 4a of the CWES) as well as the characteristics of this upland landscape type, which indicate its capacity to absorb multiple wind energy developments. Table 4a of the CWES states the following in relation to cumulative effects in the Slieve Bernagh Uplands LCA, related to the cumulative siting and design guidance for the 'Mountain Moorland' landscape type in the WEDGs (2006, DoEHLG):

> *'Acceptable, depending on topography as well as siting and design of wind energy developments involved'.*

The set-back distances between projects and the narrow valleys between prominent landforms create relatively small and separate visual units within the Slieve Bernagh Uplands LCA. These characteristics give this landscape the capacity to absorb and accommodate multiple wind energy developments, thus the cumulative effects to the landscape of the site are deemed acceptable.

Cumulative impacts on the character of the wider landscape are most likely to occur where the proposed turbines are visible in conjunction with other wind farm developments. A comprehensive assessment of likely effects arising from the intervisibility of the proposed turbines and other wind turbines in a visual context are included below in Section 14.7.3.4: 'Discussion of Cumulative Visual Effects'.

14.7.3.3 Visual Effects (Operational Phase)

14.7.3.3.1 *Selection of Photomontage Viewpoints*

Photomontages were used to assess the visual effects arising as a result of the proposed turbines from 16 No. viewpoint locations, which are presented in the *Photomontage Booklet*. These 16 No. viewpoint locations are depicted in the A0 Map in Appendix 14-4: *LVIA Baseline Map* and below in Figure 14-23 and Figure 14-24. The locations chosen for photomontages follow a detailed and extensive process including review of baseline information, site visits and high-quality photography taken at multiple locations within the LVIA Study Area. Many locations, which, according to the desktop review, were deemed to have potential views of the site, in reality, had complete intervening screening or views were visually screened to such an extent that the development of photomontages was not considered useful in terms of the assessment process, i.e. the viewpoints had little or no visibility towards the proposed turbines.

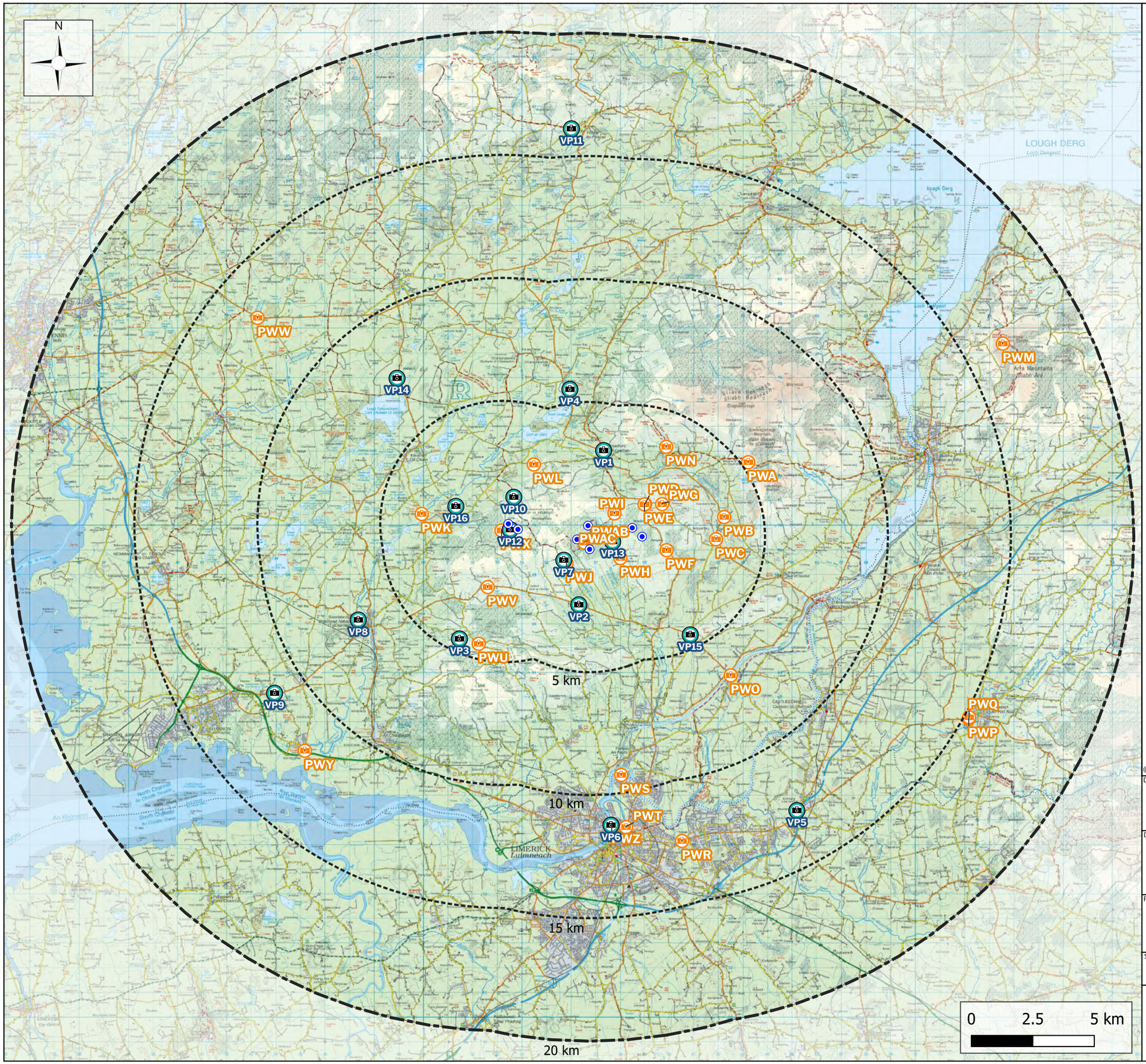
Multiple on-site surveys and visibility appraisals conducted throughout the 2022 and 2023 determined that visibility of the proposed turbines is greatest from the locations in close proximity to the Wind Farm Site owing to the characteristics of the surrounding landscape. Due to this, viewpoint selection was particularly focused on locations proximate to the site; 9 of the 16 No. final photomontage locations are located within 5km of the proposed turbines. In this regard, it is important to note that the visual impact of the proposed turbines shown in the photomontages selected for the *Photomontage Booklet* is **not entirely representative** of visual effects in the wider landscape of the 20km LVIA Study Area, **where in reality, very little visibility occurs**.

Alternative Photomontage Viewpoints – Photowires

Photomontage imagery was captured from a number of additional locations in the LVIA Study Area other than the 16 No. photomontage viewpoints selected for the *Photomontage Booklet*; these are presented as 'photowires'. Imagery was captured from 44 No. Viewpoints in total:

- 16 No. Viewpoints presented as Photomontages in the *Photomontage Booklet;*
- 28 No. Viewpoints presented as photowire visualisations (draft photomontages) in Appendix 14-5;

As early-stage photomontage visualisations, photowires comprise panoramic photos with overlaid wirelines (classified as a 'Type 3 Visualisations' in the 'Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19', 2019). For this LVIA, photowires were produced from 28 No. additional viewpoint locations in the LVIA Study Area. These viewpoints were not selected for inclusion in the *Photomontage Booklet* due to their limited visibility of the proposed turbines, or v. These photowires do not form part of the assessment of visual effects included in Appendix 14-3: *Photomontage Assessment Tables*. However, the 28 No. photowires are presented within Appendix 14-5 and are discussed below to illustrate certain important points of this assessment. The location of photowire viewpoints in Appendix 14-5 are marked as orange icons below in Figure 14-23, labelled as PW (i.e. PWA to PWAC).



Map Legend

- LVIA Study Area
- Proposed Turbines
- Photomontage Viewpoint Locations Volume 2 Booklet
- Photowire Viewpoint Locations Appendix 14-5

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Drawing No.

Figure 14-23

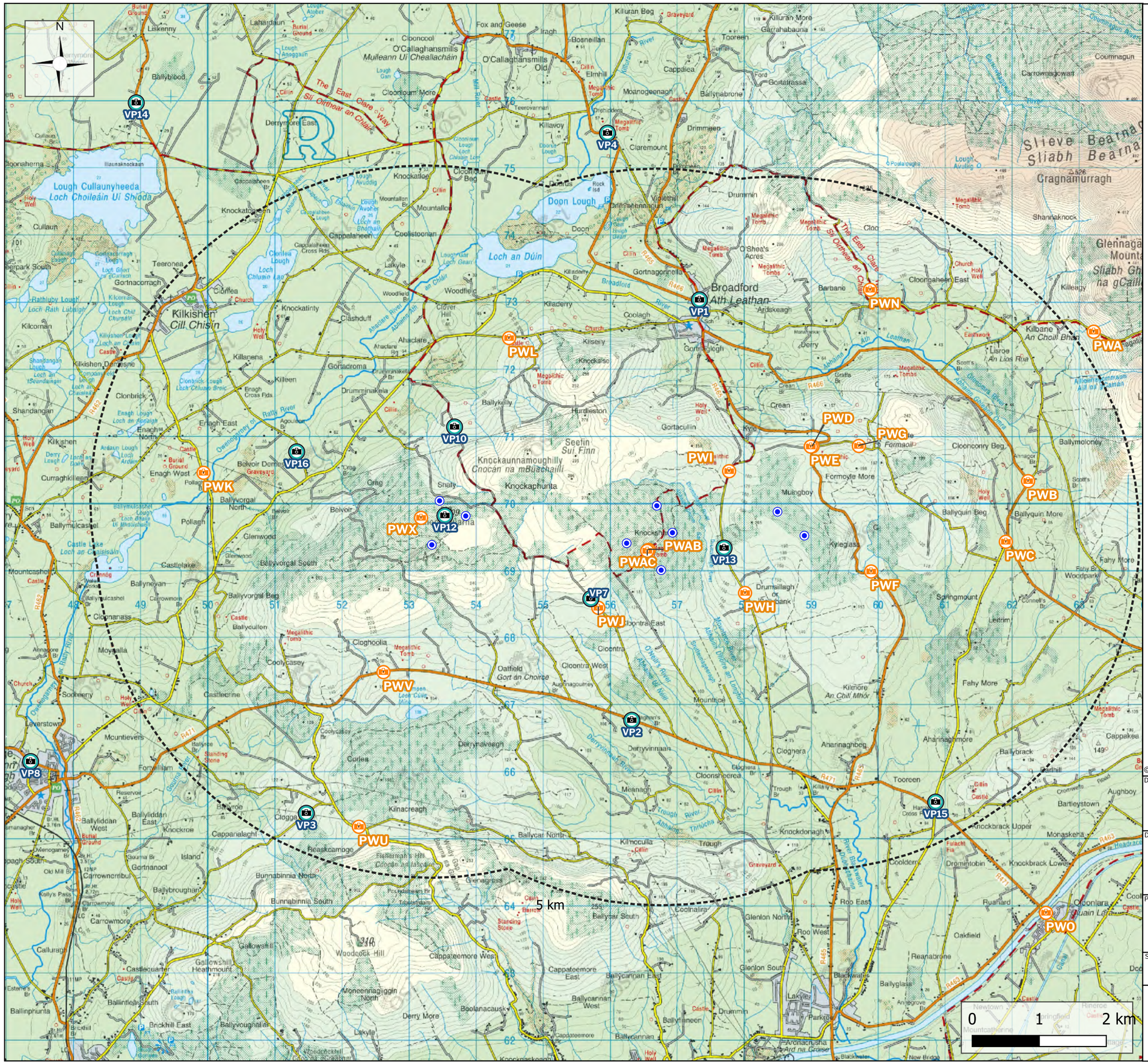
Drawing Title

Photomontage Viewpoints

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	200513	13.06.2024	JW	JS



Map Legend

- Proposed Turbines
- Photomontage Viewpoint Locations Volume 2 Booklet
- Photowire Viewpoint Locations Appendix 14-5

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Drawing No.

Figure 14-24

Drawing Title

Photomontage Viewpoints

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:55,000	200513	29.05.2024	JW	JS

14.7.3.3.2 *Summary of Photomontage Viewpoint Assessment – Appendix 14-3*

Visual effects were assessed using the assessment methodology described in Appendix 14-1: *LVIA Methodology*. Each viewpoint location is shown in Figure 14-23 and Figure 14-24 above. The comprehensive, detailed assessment of the 16 No. viewpoints is presented in Appendix 14-3: *Photomontage Assessment Tables* and summarised below in Table 14-19. Appendix 14-3 and Table 14-19 should be read in conjunction with the *Photomontage Booklet* forming Volume 2 of the EIAR.

The visual effect of the Proposed Project was assessed from each viewpoint in terms of the sensitivity of visual receptors, along with the magnitude of change, as recommended in the GLVIA3 (LI & IEMA, 2013) guidelines. This, in conjunction with a detailed review of the photomontages themselves as well as the likely visibility of the Proposed Development within the LVIA Study Area informed the assessment of visual effects.

Visualisations such as photomontages are tools that represent the likely effect of a development and are used to inform the reader's prediction of how that development will appear visually in the landscape. In terms of the predicted visual quality of the Proposed Development, however, whether a visual effect is deemed to be positive, negative or neutral, this involves a degree of subjectivity. What appears to be a positive effect to one viewer could be deemed to be a negative effect by another viewer. All predicted visual effects of the viewpoints below are deemed to be '**Long-Term**', '**Direct**' effects.

Table 14-19 Viewpoint Assessment Summary

VP No.	Viewpoint Description	Grid Ref.	Distance and Direction from nearest proposed turbine	Visual Sensitivity of Receptor(s) (at viewpoint)	Magnitude of Change	Residual Significance of Visual Effect
VP1	View from St. Peter's Church in the village of Broadford, within the townland of O'Shea's Acres. This viewpoint is located approximately 3.1km north of the nearest proposed turbine (T5).	E: 557,298 N: 673,084	3.1km S	Medium	Slight	**Slight (EPA, 2022)**
VP2	View from R471 regional road in the townland of Derryvinnaan. This viewpoint is located approximately 2.3km south of the nearest proposed turbine (T7). **Two No. fields of view are presented in the EIAR Volume 2: Photomontage Booklet to show the full horizontal extent of the proposed turbines*	E: 556,289 N: 666,813	2.3km N	Medium	Moderate	**Moderate (EPA, 2022)**
VP3	View from the townland of Clogga along Co. Clare designated Scenic Route (SR)-22 (CCDP). This viewpoint is located approximately 4.4km south of the nearest proposed turbine (T1).	E: 551,434 N: 665,426	4.4km N	High	Negligible	**Slight (EPA, 2022)**
VP4	View from the townland of Moanogeenagh along Co. Clare designated SR-25 (CCDP). This viewpoint is located approximately 5.6km north of the nearest proposed turbine (T5).	E: 555,927 N: 675,571	5.6km S	Hight	Slight	**Slight (EPA, 2022)**

VP No.	Viewpoint Description	Grid Ref.	Distance and Direction from nearest proposed turbine	Visual Sensitivity of Receptor(s) (at viewpoint)	Magnitude of Change	Residual Significance of Visual Effect
VP5	View from the R445 regional road in the townland of Mountshannon. This viewpoint is located approximately 12.8km southeast of the nearest proposed turbine (T9).	E: 565,159 N: 658,448	12.8km NW	Medium	Slight	**Not Significant (EPA, 2022)**
VP6	View from Thomond Bridge in Limerick City. This viewpoint is located approximately 11.2km south of the nearest proposed turbine (T7).	E: 557,598 N: 657,853	11.2km N	High	Slight	**Slight (EPA, 2022)**
VP7	View from a local road in the townland of Cloontra. This viewpoint is located approximately 975m southwest of the nearest proposed turbine (T4).	E: 555,678 N: 668,627	975m NE	High	Substantial	**Moderate (EPA, 2022)**
VP8	View from the settlement of Sixmilebridge in the townland of Sixmilebridge. This viewpoint is located approximately 6.8km southwest of the nearest proposed turbine (T1).	E: 547,318 N: 666,197	6.8km NE	Medium	Negligible	**Not Significant (EPA, 2022)**
VP9	View from R471 regional road in the townland of Clonmoney North. This viewpoint is located approximately 11.3km southwest of the nearest proposed turbine (T1).	E: 543,915 N: 663,219	11.3km NE	Medium	Slight	**Slight (EPA, 2022)**
VP10	View from local road in the townland of Snaty (Cooper). This viewpoint is located	E: 553,646 N: 671,189	1.1km S	High	Moderate	**Moderate (EPA, 2022)**

VP No.	Viewpoint Description	Grid Ref.	Distance and Direction from nearest proposed turbine	Visual Sensitivity of Receptor(s) (at viewpoint)	Magnitude of Change	Residual Significance of Visual Effect
	approximately 1.1km north of the nearest proposed turbine (T2).					
VP11	View from a local road near the village of Feakle in the townland of Baurroe. This viewpoint is located approximately 16km north of the nearest proposed turbine (T5).	E: 555,986 N: 686,167	16km S	Medium	Slight	**Not Significant (EPA, 2022)**
VP12	View from the summit of the 12 O'Clock Hills walking route in the townland of Snaty (Wilson). This viewpoint is located within the western cluster of turbines, approximately 224m south of the nearest proposed turbine (T2). **Three No. fields of view are presented in the EIAR Volume 2:* Photomontage Booklet *as a result of the positioning of this viewpoint within the Western Cluster of turbines.*	E: 553,501 N: 669,867	224m N	High	Substantial	**Significant (EPA, 2022)**
VP13	View from L3042 local road in the townland of Drumsillagh or Sallybank (Parker). This viewpoint is located approximately 800m west of the nearest proposed turbine (T6).	E: 557,666 N: 669,383	800m E	High	Substantial	**Significant (EPA, 2022)**
VP14	View from the townland of Ballyblood along Co. Clare designated Scenic Route SR-24 (CCDP).	E: 548,897 N: 676,025	7.4km SE	High	Slight	**Slight (EPA, 2022)**

VP No.	Viewpoint Description	Grid Ref.	Distance and Direction from nearest proposed turbine	Visual Sensitivity of Receptor(s) (at viewpoint)	Magnitude of Change	Residual Significance of Visual Effect
	This viewpoint is located approximately 7.4km northwest of the nearest proposed turbine (T2).					
VP15	View along the R471 regional road within the townland of Tooreen. This viewpoint is approximately 4.4km southeast of the nearest proposed turbine (T9).	E: 560,823 N: 665,593	4.4km NW	Low	Slight	**Not Significant (EPA, 2022)**
VP16	View from a local road in the townland of Belvoir. This viewpoint is located approximately 2.2km west of the nearest proposed turbine (T2).	E: 551,290 N: 670,817	2.2km E	Medium	Moderate	**Slight (EPA, 2022)**

The assessment of visual effects determined the residual significance of the visual effects to range from 'Significant' to 'Not Significant', with the number of findings at each level of significance listed in Table 14-20 below.

Table 14-20 Summary of Viewpoint Impact Assessment Results

Significance of Residual Visual Effect	Description (EPA, 2022)	No. of Viewpoints
Profound	An effect which obliterates sensitive characteristics.	0
Very Significant	An effect, which by its character, magnitude, duration, or intensity alters most of a sensitive aspect of the environment.	0
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.	2
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.	3
Slight	An effect which causes noticeable changes in the character of the environment but without significant consequences.	7
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.	4
Imperceptible	An effect capable of measurement but without significant consequences.	0

The significance of the residual visual effect was not considered to be 'Profound' or 'Very Significant' at any of the 16 No. viewpoint locations. A residual effect of 'Significant' was deemed to arise at two locations, whilst the remaining residual effects were found to be 'Moderate' (three), 'Slight' (seven) and 'Not Significant' (four). There were no 'Imperceptible' residual effects. The determination of significance of effects in the table above accounts for likely cumulative visual effects which are discussed in Section 14.7.3.4.

The viewpoint assessment results from Appendix 14-3: *Photomontage Assessment Tables* are summarised and discussed in more detail in the following sections.

14.7.3.3.3 Discussion of Visibility and Visual Effects on Specific Visual Receptors in the LVIA Study Area

The assessment of visual effects uses photomontages shown in the *Photomontage Booklet* and discussion of these effects is aided by the photowires presented in Appendix 14-5: *Photowire Booklet*. As reported in this chapter, ZTV mapping was also used for scoping receptors in and out (based purely on topography) and selection of photomontage viewpoints. The ZTV indicates vast areas of the LVIA Study Area where the proposed turbines will not be visible, as comprehensively discussed in Section 14.3. The following section discusses the visual effects arising at key sensitive visual receptors within the zone of theoretical visibility and scoped in for assessment previously in Section 14.5: 'Visual Baseline'.

Designated Scenic Routes and Views

As reported above in Section 14.5, 7 No. designated Scenic Routes and Views were scoped out of the assessment as the ZTV indicated no visibility and site visits indicated substantial visual screening, and 7 No. designated Scenic Routes and Views and one OSi Viewing Point were scoped in for further assessment; the scoped-in receptors are discussed here.

C SR-22 – From Brickhill Bridge north-east to road junction at Reaskcamoge.
There is primarily partial theoretical visibility along this Scenic Route as a result of the undulating topography of the landscape in this area and along the route itself. Site visits determined that views would be limited by roadside vegetation in the direction of the proposed turbines and that the key sensitive scenic amenity from the route is to the west and north-west in a different direction than the proposed turbines. Viewpoint VP3 is located along this Scenic Route, at the eastern end of the route, which is one of the closest locations along the route to the proposed turbines. The sensitivity of VP3 was determined to be 'High', with a 'Negligible' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Slight'**.

C SR-24 – Views in and out of Lough Cullaunyheeda.
There is primarily partial theoretical visibility of the proposed turbines along this Scenic Route as a result of the undulating topography of the Wind Farm Site located in the Slieve Bernagh uplands. Site visits determined that views in the direction of the proposed turbines would also be limited by roadside vegetation, particularly from locations closest to Lough Cullanyheeda. Viewpoint VP14 is located along this Scenic Route, where open and unobstructed views towards the proposed turbines were available. The sensitivity of VP14 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

C SR-25 – Views in and out of Doon Lough.
There is full theoretical visibility along the northern part of this Scenic Route, with partial theoretical visibility along the southern part, which is located closer to the proposed turbines. Site visits determined that views on the ground would be limited by roadside vegetation in the direction of the proposed turbines, particularly from locations closest to Doon Lough, and where partial theoretical visibility is indicated by the ZTV. Viewpoint VP4 is located along this Scenic Route, where open and unobstructed views towards the proposed turbines were available. The sensitivity of VP4 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

C SR-26 – R466 between Broadford and O'Briensbridge.
There is full theoretical visibility along the southeastern half of this Scenic Route, with no theoretical visibility along the northwestern half, with a small section of partial theoretical visibility in the middle of the route. Site visits determined that the section of the route with full theoretical visibility would have no or very limited actual visibility of the proposed turbines given the high level of roadside screening present. This was confirmed during the RSA undertaken (recall above Figure 14-3), where the dominant visual screening classes along this stretch were recorded as 'Full Screening' and 'Intermittent/Partial Screening' (see also discussion of this road in Section 14.3.3.1 'Visibility in Close Proximity: RSA'). Photowires PWB and PWC (See Appendix 14-5) are both located along this Scenic Route and show no visibility in the case of PWC, and very limited visibility of the Eastern Cluster of proposed turbines in PWB. Given the very low level of visibility of the proposed turbines from along this Scenic Route, residual visual effects will be Long-term and **'Not Significant'**.

T SR-57 – View west on the Cork Road approach to Newport.
There is full theoretical visibility of the proposed turbines along this Scenic Route, located approximately 13km from the nearest proposed turbine at its closest point. Site visits determined many locations along the route where visibility of the proposed turbines could not be established as a result of roadside screening. Photowires PWP and PWQ are both located near the southern end of the route, with very limited visibility of the proposed turbines apparent in both of those views (see Appendix 14-5). Where views of the turbines do occur, they are seen as very small background elements within the

view, seen through gaps in the hedgerow from an elevated location. This is representative of the types of views of the proposed turbines that will intermittently be available along this Scenic Route. Given the very low level of visibility of the proposed turbines and the distances involved from along this Scenic Route, residual visual effects will be Long-term and '**Not Significant**'.

C SR-21 – Road through Ballysallagh east, southwards to Ballycally.
There is a mix of full, partial, and no theoretical visibility along this Scenic Route, which is located approximately 15.6km west of the nearest proposed turbines at its closest point. Visibility along this route will be more limited than indicated by the ZTV as a result of roadside screening the heavily vegetated landscape that makes up this part of the LVIA Study Area. Viewpoint VP9 is located at a similar geographic orientation as this route, although it is located 4.4km closer to the proposed turbines than the route. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

L SR-1 – *'In the east of the County, the Slieve Felim way route close to Murroe, makes an attractive walking route to complement the attractions of the Clare Glens'* (Section 6.4.2, LDP).
This Scenic Route is partially located within the LVIA Study Area, with the northern section of the route located between 17.5 and 20 km from the nearest proposed turbine. There are expansive views directed towards the proposed turbines available from along the route, although site visits determined that roadside screening would limit visibility in some locations. Photowires PWP and PWQ are both located near this route, with very limited visibility of the proposed turbines apparent in both of those views (see Appendix 14-5). Where views of the turbines do occur, they are seen as very small background elements within the view, seen through gaps in the hedgerow from an elevated location. This is representative of the scale of the proposed turbines in views that will intermittently be available along this route. Given the very small horizontal and vertical extent of the proposed turbines in these views, and the distances involved from along this route, residual visual effects will be Long-term and '**Not Significant**'.

OSi Viewing Area: View from Tountinna Mountain on the Arra Mountains loop, in the townland of Killary.
There is partial theoretical visibility at this viewpoint, which is located approximately 16.5km from the nearest proposed turbines. This viewpoint represents receptors of High sensitivity. Photowire PWM is located here; as can be seen from the photowire in Appendix 14-5, only visibility of the blade tips of three turbines is likely to occur from this viewpoint. Given the very small extent of the proposed turbines in these views, and the distances involved, residual visual effects will be Long-term and '**Not Significant**'.

Other Visual Receptors – Settlements

Of the 32 No. Settlements identified in the LVIA Study Area, 14 No. were scoped out in the 'Visual Receptor Preliminary Analysis', as the ZTV indicated that there was no theoretical visibility and/or no visibility of the proposed turbines could be established on-site, or the Settlements were located at such a substantial distance from the Proposed Development that 'Significant' visual effects were deemed not likely to arise from receptors of medium sensitivity. Hence, viewpoints were selected for the remaining 18 No. Settlements; these are discussed below.

Broadford – VP1
This is the closest Settlement to the proposed turbines and has a mix of theoretical visibility. With no visibility occurring to the southwest of the Settlement, partial theoretical visibility at the centre and across the majority of the Settlement, and an area of full theoretical visibility to the northeast. Viewpoint VP1 is located within this Settlement, captured from an elevated vantage point outside St. Peter's Church. The proposed turbines are well screened from this viewpoint with lower levels of visibility likely to occur from lower elevated locations, in around the rest of the Settlement, given increased screening by built form and vegetation, as well increased screening from the ridgelines seen in this view. The sensitivity of VP1 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Kilkishen – VP16, PWK
This Settlement is located 4.8km from the nearest proposed turbines at its closest point and has primarily partial theoretical visibility. Viewpoint VP16 is located at a similar geographic orientation as the Settlement, although it is located 2.6km closer to the proposed turbines than this Settlement. The sensitivity of VP16 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Photowire PWK is also located within this part of the LVIA Study Area, although situated 1.3km closer to the proposed turbines than Kilkishen. It shows a similar view as VP16, with only the western cluster of turbines visible from this viewpoint. Views from Kilkishen will be similar to the views shown here, although with a smaller-scale turbine visible given the increased set-back distance. Site visits also determined multiple screening elements within the village that would make these types of views intermittent. There will be some locations, however, where this type of view is available from the Settlement. Given the small horizontal extent of the proposed turbines in these views, and the residual visual effect determined to arise at VP16, which is located 2.6km closer to the proposed turbines, residual visual effects will be Long-term and '**Not Significant**' for the Settlement of Kilkishen.

Bridgetown – VP15, PWO
Bridgetown is located within a valley and consequently has a narrow strip of theoretical visibility that occurs between the topographical screening provided by the adjacent ridgelines. There are also areas within the north of the Settlement with no theoretical visibility. From locations within the Settlement where theoretical visibility was indicated, it was determined during site visits that visibility of the proposed turbines would be further limited by the treelines present within the village and on the surrounding valleys. There will be some limited visibility of the proposed turbines from certain locations within the village, but there will also be substantial visual screening provided by these treelines and other built infrastructure. Viewpoint VP15 is located at a similar geographic orientation and distance as Bridgetown in relation to the proposed turbines. The sensitivity of VP15 was determined to be 'Low', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Not Significant**'.

Bridgetown is likely a 'Medium' sensitivity receptor, but with more limited views than those seen in VP15, for the reasons discussed previously. Photowire PWO is also located at a similar geographic orientation and distance as Bridgetown, and demonstrates the effect that treelines within the landscape have on visibility of the proposed turbines at locations where full theoretical visibility is indicated. Given the likely level of visibility from Bridgetown outlined here, and the residual visual effect determined to arise at VP15, residual visual effects will be Long-term and '**Not Significant'.**

O'Briensbridge – VP15, PWO
O'Briensbridge is located near Bridgetown, but 1.5km further from the proposed turbines, at a similar geographic orientation. There is no theoretical visibility in the southern part of the Settlement, and partial theoretical visibility for the northern part. The same topography that limits views from O'Briensbridge gives rise to this pattern of theoretical visibility. There will be very limited visibility of only the upper components of the Eastern Cluster of turbines from this location, as a result of topographical screening and built from within the village, which will prevent views of the proposed turbines from the majority of the Settlement. Viewpoint VP15 is located at a similar geographic orientation and distance as O'Briensbridge in relation to the proposed turbines. The sensitivity of VP15 was determined to be 'Low', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-Term and '**Not Significant**'.

O'Briensbridge is a 'Medium' sensitivity receptor, but with more limited views than those seen in VP15, for the reasons discussed previously. Photowire PWO is also located at a similar geographic orientation and distance as O'Briensbridge, and demonstrates the effect that treelines within the landscape have on visibility of the proposed turbines at locations where full theoretical visibility is indicated. Given the

likely level of visibility from O'Briensbridge outlined here, and the residual visual effect determined to arise at VP15, residual visual effects will be Long-term and **'Not Significant'**.

Cloonlara – PWO
There are areas of full, partial, and no theoretical visibility in Cloonlara, with photowire PWO captured from a high point within the Settlement, along the raised banks of the River Shannon. As can be seen from this view, there is no visibility from this location and this is likely to be the case for the rest of the Settlement, given the distance from the site and the level of visual screening provided by treelines, which appear frequently in this locale. Site visits could not determine any further open locations from this Settlement, and as a result, it is unlikely that the proposed turbines will be seen from this receptor. In winter months, there may be less screening provided by the deciduous trees seen in PWO. However, considering the distances involved (see for example the scale of the turbines seen in VP15, which is 2.3km closer than PWO to the proposed turbines), and the level of visual screening already seen in PWO, the residual effects of views are likely to be Long-term and **'Not Significant'**, if turbines are seen in winter months.

Sixmilebridge – VP8
This Settlement is located 6.5km from the nearest proposed turbines and has partial theoretical visibility. Viewpoint VP8 is located within this Settlement. The proposed turbines are well-screened from this viewpoint, with lower levels of visibility again likely to occur from lower elevated locations, in and around the majority of the Settlement, given increased screening by the built environment and vegetation, as well increased visual screening from the ridgelines seen in this view. The sensitivity of VP8 was determined to be 'Medium', with a 'Negligible' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Not Significant'**.

Kilmurry – VP8, PWK
This Settlement is located 6km from the nearest proposed turbines at its closest point and has primarily partial theoretical visibility. Viewpoint VP8 is located at a similar geographic orientation and distance from the proposed turbines as this Settlement. The sensitivity of VP8 was determined to be 'Medium', with a 'Negligible' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Not Significant'**.

Photowire PWK is also located within this part of the LVIA Study Area, although situated 2.5km closer to the proposed turbines than Kilmurry. It shows that only the Western Cluster of turbines is visible from this viewpoint. Views from Kilmurry will be similar to the views shown here, although with a smaller-scale turbine visible given the increased set-back distance. Site visits also determined that there were multiple screening elements within the village that would make these types of views intermittent. There will be some locations, however, where this type of view will be available from this Settlement. Given the small horizontal extent of the proposed turbines in these views, and the residual visual effect determined to arise at VP8, which is located 2.5km closer to the proposed turbines, residual visual effects will be Long-term and **'Not Significant'**.

Castleconnell – VP5, PWO, PWP, PWQ
Castleconnell is located 11km from the proposed turbines of the Eastern Cluster and has primarily full theoretical visibility. Viewpoint VP5 is located at a similar geographic orientation and distance from the proposed turbines as this Settlement. The sensitivity of VP5 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Not Significant'**.

Newport – PWP, PWQ
Newport is located 15.1km from the nearest proposed turbines and has full theoretical visibility. Photowires PWP and PWQ are both located on the northwestern edge of this Settlement, with very limited visibility of the proposed turbines apparent in both of those views (see Appendix 14-5). Where views of the turbines do occur, they are seen as very small background elements within the view, seen through gaps in the hedgerow from an elevated location. This is representative of the most open views possible of the proposed turbines that will be available from Newport. Given the very small horizontal

and vertical extent of the proposed turbines in these views, and the distances involved, residual visual effects will be Long-term and **'Not Significant'**.

Tulla – VP14, PWW
Tulla is located 10.5km from the nearest proposed turbine and has an area of full theoretical visibility existent within the Settlement. Viewpoint VP14 is located at a similar geographic orientation and distance from the proposed turbines as this Settlement. The sensitivity of VP14 was determined to be 'High' on account of the designated Scenic Route that it is located along. The sensitivity of Tulla is determined to 'Medium', a lower sensitivity receptor than the Scenic Route, with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Not Significant'**.

Feakle – VP11
Feakle is located 16.3km from the nearest proposed turbine and features one area of full theoretical visibility existent within the Settlement. Viewpoint VP11 is located just outside Feakle. The sensitivity of VP11 was determined to be 'Low', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Not Significant'**.

Parteen – VP6, PWS
Parteen is located 8.6km from the nearest proposed turbine, with partial theoretical visibility indicated. Photowire PWS is located 500m southwest of Parteen, on the southern side of St. Thomas Island in Limerick, and shows no visibility of the proposed turbines as a result of screening from vegetation. PWS demonstrates the effect that treelines within the landscape have on visibility of the proposed turbines at locations in this part of the LVIA Study Area where theoretical visibility is indicated. There will also be many locations within Parteen where the turbines are entirely screened by built infrastructure and vegetation. Viewpoint VP6 is located at a similar geographic orientation as Parteen, in relation to the proposed turbines, although situated approximately 2.7km further from the proposed turbines. The sensitivity of VP6 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Slight'**.

Parteen is a 'Medium' sensitivity receptor, although the type of view shown in VP6 is likely to occur from some limited locations within Parteen. Given the likely level of visibility from Parteen outlined here, and the residual visual effect determined to arise at VP6, residual visual effects will be **'Not Significant'**.

Athlunkard – VP6, PWR, PWS
Athlunkard is located approximately 1km southeast of Parteen, with similar levels of visibility likely to arise from this Settlement. Again, photowire PWS demonstrates the effect that treelines within the landscape have on visibility of the proposed turbines at locations in this part of the LVIA Study Area where theoretical visibility is indicated. There will also be many locations within Athlunkard where thew turbines are entirely screened by built infrastructure and vegetation. VP6 is located at a similar geographic orientation as Parteen, in relation to the proposed turbines, although it is located approximately 1.1km further from the proposed turbines. The sensitivity of the VP6 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Slight'**.

Athlunkard is a 'Medium' sensitivity receptor, although the type of view shown in VP6 (see also photowire PWR) is likely to occur from some limited locations within Athlunkard. Given the likely level of visibility from Athlunkard outlined here, and the residual visual effect determined to arise at VP6, residual visual effects will be Long-term and **'Not Significant'.**

Limerick: VP5, VP6, PWR, PWT, PWS, PWZ
Limerick City is located between 10–15km from the nearest proposed turbine, with large areas of partial theoretical visibility to the west of the city, and full theoretical visibility indicated for the centre and east of the city. Site visits determined that from much of the city itself, considering the set-back distance from the turbines, the built environment will prevent visibility of the proposed turbines. This will occur in the

majority of the city, see photowire PWS, for example. From locations where open views are available, such as bridges (see photowires PWR and PWT), where open water allows longer-ranging views, there will be intermittent and partial visibility of the proposed turbines. Viewpoint VP6 is located within Limerick City, at Thomond Bridge where there are unobstructed views towards the proposed turbines. The sensitivity of VP6 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'. This represents one of the most open views of the Proposed Development from the city, and this level of visibility reduces quickly with a change in locations (e.g. see photowire PWZ, which is located only on the eastern side of the same bridge).

Bunratty: VP9, PWY
Bunratty is located 11.4km from the nearest proposed turbine and has full theoretical visibility. Photowire PWY is located on the bridge in Bunratty, above the Owenagarney River, and shows that the proposed turbines will be visible from locations around the village. The view of turbines is similar to that seen in viewpoint VP9, located 2.6km to the northwest, at a similar geographic orientation and distance from the proposed turbines as Bunratty. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Shannon: VP9, PWY
The Settlement of Shannon is located 14.4km from the nearest proposed turbine and has large areas of full theoretical visibility. From within the town itself, views will be quite limited as a result of screening from built infrastructure and vegetation, particularly at these distances. Viewpoint VP9 is located on the eastern edge of Shannon. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Clooney: PWW
Clooney is located 15km from the nearest proposed turbines, and has full theoretical visibility. Site visits determined that actual visibility from Clooney will be very limited as a result of vegetation in the flat landscape where Clooney is located. Photowire PWW is located southeast of Clooney and demonstrates one of the most open views available from the surrounds of Clooney. The proposed turbines are seen as very small background elements within this view, partially screened by the roadside vegetation. The proposed turbines are also well-screened by the topography of the site. Given the separation distances involved and the scale of the proposed turbines seen within PWW, residual visual effects will be Long-term and '**Not Significant**'.

Quin: PWW
Quin is located within the same part of the LVIA Study Area as Clooney, with full theoretical visibility indicated. Site visits determined that actual visibility from Quin will be very limited as a result of vegetation in the flat landscape. Photowire PWW is located east of Quin and demonstrates one of the most open views available from the surrounds of Quin. The proposed turbines are seen as very small background elements within this view, partially screened by the roadside vegetation. The proposed turbines are also well-screened by the topography of the site. Again, given the separation distances involved and the scale of the proposed turbines seen within PWW, residual visual effects will be Long-term and '**Not Significant**'.

Other Visual Receptors - Recreational, Cultural Heritage and Tourist Destinations

Of the 17 no. recreational, cultural heritage and tourist destinations identified within the LVIA Study Area, 8 No. recreational routes were scoped out from further assessment in the 'Visual Receptor Preliminary Analysis', as the ZTV indicated that there was no theoretical visibility and/or no visibility of the proposed turbines could be established on-site. Hence, viewpoints were selected for the remaining 9 No. recreational, cultural heritage and tourist destinations.

East Clare Way: VP1, VP10, VP11, PWA, PWN, PWI, PWAC, PWAB

The East Clare Way travels through much of the northern part of the LVIA Study Area, with large stretches of no theoretical visibility where it passes close to Lough Derg, in the northeastern part of the LVIA Study Area, where the route moves south of Moylussa, it enters an area of full theoretical visibility approximately 5.7km east of the Eastern Cluster of turbines. Photowire PWA is located at this point, and shows a view from an elevated vantage point of all proposed turbines, across the Wind Farm Site. Photowire PWN is located approx. 3.5km further along the walking route, where there is slightly more visual screening from topography and vegetation, but with views of all proposed turbines, seen across the valley, as in PWA. The route then passes through Broadford where viewpoint VP1 is located. The sensitivity of VP1 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Passing through Broadford, the route travels into the Central Cluster of proposed turbines, with photowire PWI located along this part of the route, close to where the route leaves the public road network. There are open views of the Eastern Cluster from here but with the Central Cluster screened by roadside vegetation. Photowires PWAB and PWAC are both located further along the route, within the Central Cluster of turbines, with views of the proposed turbines available in multiple directions from this location.

The route then traverses the site, after passing through the Central Cluster and travelling northwards, viewpoint VP10 is located along this part of the route, where it begins to descend the hill of Knockaunnamoughilly. The sensitivity of VP10 was determined to be 'High' on account of the residential receptors located nearby, with a 'Moderate' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Moderate'**. As the route travels north away from the site, it enters a large flat, heavily vegetated area of partial theoretical visibility, with an increased visual screening effect arising with increased distance from the Wind Farm Site.

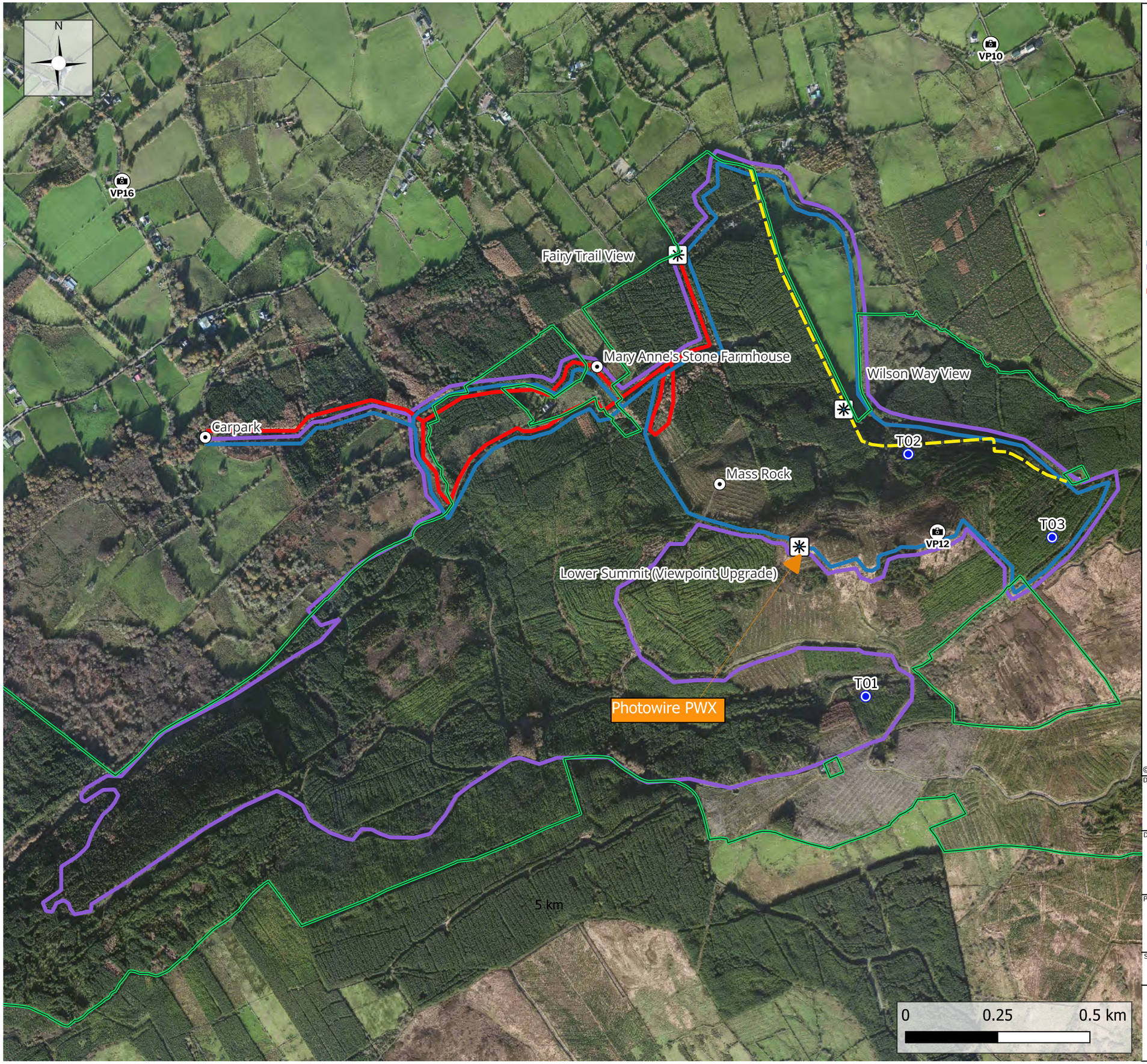
The section of the route located within the Site passes through commercial plantation forestry that covers most of the site. While this section does have recreational value, this aesthetic value and naturalness of this part of the route is reduced by human interference in the form of plantation forestry, which also heavily restricts views, although from certain locations long range views are available. Due to the cyclical nature of commercial forestry, this will be felled at some point in the future, although it is likely that the Site will remain fundamentally unchanged in terms of its character as a commercial forestry landscape.

Receptors on this walking route will potentially encounter visual effects from other wind energy developments in a future receiving environment, as there are a number of other permitted and proposed wind energy developments in the Slieve Bernagh uplands which is a strategic LCA for wind energy development. For example, the Mid Clare Way passes through the proposed Lackareagh Wind Farm in close proximity to the viewpoint shown in Photowire PWA, and therefore sequential cumulative effects will arise on users of the walking route. A more comprehensive discussion of cumulative visual effects is included in Section 14.7.3.4 – *Cumulative Visual Effects.*

Overall, taking into consideration all of the above factors, including the overall length of the route and the relatively small section where the proposed turbines are located, the Proposed Development will give rise to a Long-term and '**Moderate**' visual effect on the East Clare Way.

12 O'Clock Hills Looped Walks: VP12, PWX

The 12 O'Clock Hills Walking Route is a looped walking route that passes through the western part of the Wind Farm Site, including between the turbines of the Western Cluster. The majority of the route passes through an area of partial theoretical visibility, with a small stretch of full theoretical visibility indicated along the south-eastern section of the route.



Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Photomontage Viewpoint Locations
- Point of Interest
- Proposed New Section of Walking Trail (Not public road)
- Proposed Viewing Areas

Existing 12 O'Clock Hills Looped Walks

- Blue
- Purple
- Red

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Drawing No.

Figure 14-25

Drawing Title

12 O'Clock Hills Walking Route

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:10,000	200513	18.07.2024	JW	JS

As illustrated above in Figure 14-25, the walking route generally commences from the 12 O'Clock Hills car park, located at the westernmost point along the route. The route then climbs the hill passing through large tracts of commercial forestry. At these locations lower on the route, there will likely be no, or very limited, actual views of the proposed turbines, given the level of screening from the surrounding forestry. There are a number of locations of interest along this part of the route, such as Mary Anne's Stone Farmhouse, and Mass Rock, as indicated by the information signage present at these locations (see below Plate 14-20 and Plate 14-21). These locations are also indicated below in Figure 14-25. At these locations, there will be no actual visibility of the proposed turbines, as a result of screening from the surrounding forestry. Although, it is noted that there are long-range views to the north available from Mass Rock, see below Plate 14-22.

Plate 14-20 Signage near Mary Anne's Stone Farmhouse

Plate 14-21 Signage and Seating at Mass Rock

Plate 14-22 View to the North from the Location of Mass Rock

Further along the path from Mass Rock, the route leaves the forestry and approaches the lower summit of the 12 O'Clock Hills. There will be views of the proposed turbines to the east from this location, situated 380m from the nearest proposed turbine (T2) (see photowire PWX in Appendix 14-5). This lower summit has impressive views of the surrounding landscape in particular to the northwest, north and northeast), along with benches and information signage; for example, see below Plate 14-23 and Plate 14-24.

Plate 14-23 View to the West from the Lower Summit of 12 O'Clock Hills

These images show an area where upgrades to the viewing amenities are included as part of the Proposed Development, where the panoramic scenic views are not impacted by the proposed turbines. This location is marked on Figure 14-25 above, labelled 'Lower Summit Viewpoint'.

Plate 14-24 View to the Northwest from the Lower Summit of 12 O'Clock Hills

The route then continues east towards the summit of Knockanuarha. This is the location of viewpoint VP2, which shows the panoramic view available from the summit, situated within the middle of the Western Cluster of turbines. The sensitivity of VP12 was determined to be 'High' on account of the recreational users of the path, as well as the summit views available, with a 'Substantial' magnitude of change determined to arise. The residual visual effect was deemed to be Long Term and '**Significant**', as detailed in full in Appendix 14-3: *Photomontage Assessment Tables*. This significant impact accounts for potential cumulative effects with other proposed developments in the area. It is noted that, in views from this location, turbines T2 and T1 are sited in a 'Strategic Area' for wind energy development by the CWES (Volume 6 of the CCDP). Turbine T3 is located approx. 35m from the border of the 'Strategic Area', within an area designated as 'Acceptable in Principle'. The proposed turbines are therefore visible within an area of the landscape where it is envisioned for turbines to be seen, as guided by local planning policy. In addition, while the proposed turbines are seen within parts of the panoramic view, including long-range views to the north over the flat agricultural plain, the proposed

turbines do not obstruct these views. Given that the three closest of the proposed turbines are seen in different directions from this viewpoint, with a large degree of visual separation in views, the expansive long-range views are still available from this location.

Following this summit, the route proceeds east where it passes by T3 itself, before turning back north down the hill, where the primary focus of views will be to the north, away from the proposed turbines. The route passes the turbines to the west at the bottom of the hill, re-entering dense forestry until it returns to the car park. There will be a Long-term and '**Significant**' visual effect that arises on the summit of the route, given its proximity to the proposed turbines. However, this effect is limited to this location at the summit. From large parts of the route, there will be no, or very limited visibility of the proposed turbines. In addition, as seen above in Figure 14-25, additional mitigation measures are proposed as part of the Proposed Development to offset effects upon the recreational amenity of this route. Early-stage LVIA analysis identified that the proposed turbines will likely give rise to 'Significant' effects on visual amenity from this viewpoint and some areas of the walking trails. Therefore, plans have been prepared in order to mitigate and offset potential impacts on these local recreational amenities, as detailed below.

New recreational amenities are proposed as part of the Proposed Development. These amenities include for the provision of a new recreational walking trail comprising a 1.4km route, illustrated by a dashed yellow line in the above amenity map (Figure 14-25). The map shows 3 No. 'Proposed Viewing Areas' which are proposed amenities comprising viewing decks and seating as per the example below in Plate 14-25. Specific details of the proposed amenities include the following:

- Two new viewing areas and one upgrade to an existing viewing area will be provided as part of the Proposed Development. These viewing areas provide unobstructed landscape views to the north. A viewing deck, seating, signage and binoculars are proposed for both new viewing areas, where there will be long-ranging views, unobstructed by turbines;
  - One new viewing area will be placed along the north-eastern extent of the existing 12 O'Clock Hills' Red Trail, this is named 'Fairy Trail View' on Figure 14-25 previously;
  - Upgrades will be made to the existing viewing area at the Lower Summit of Knockanuarha – west of viewpoint VP12.
  - A new viewing area is also proposed on the new walking trail to the north of turbine T2, this is named 'Wilson Way View' on Figure 14-25 previously.
- The construction methodology for the Proposed Development will ensure that access to the peak of the 12 O'Clock Hills (Knockanuarha) during the construction phase of the Proposed Development is maintained, aside from a maximum of 9 No. days while the proposed turbines are erected;
- Whilst the proposed turbines will cause a 'Significant' impact on the existing views at the 12 O'Clock Hills peak, the proposed design and construction of the new recreational walking trail and new viewing areas will enable access to, as well as enjoyment and appreciation of, landscapes and scenic amenity of equivalent quality.

An example of the type of viewing areas to be created can be seen below in Plate 14-25, which shows an example viewing area located at the Slieve Bawn Wind Farm, situated within a similar upland forestry landscape as the Wind Farm Site.

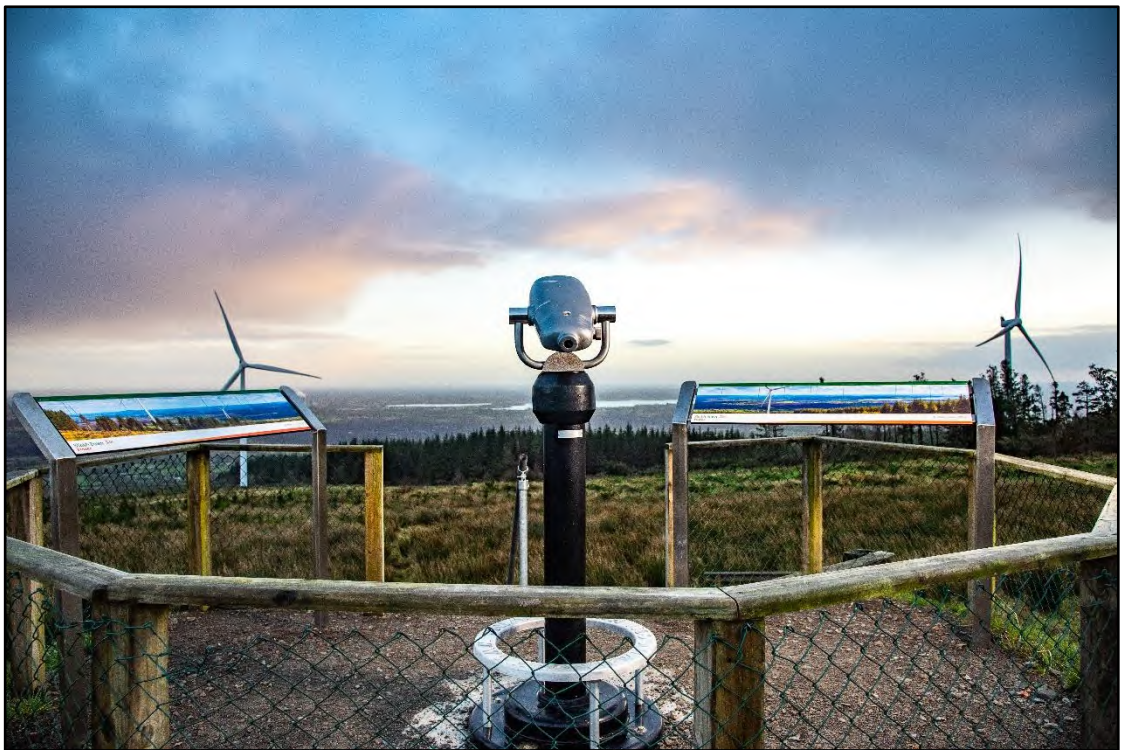


Plate 14-25 Example Viewing Area created within the Slieve Bawn Wind Farm Site

Considering the above detailed mitigation measures shown above in Figure 14-25, as well as the favourable local planning policy for the wind turbines seen within the views from the path (recall above Section 14.4.1.1.1), and the fact that there are large parts of the route with no, or limited visibility of the proposed turbines themselves, the **overall residual visual effect on the route is considered to be 'Moderate', with localised 'Significant' visual effects** occurring along the higher elevated parts of the route.

Lough Derg Way: VP15, PWT, PWZ, PWO, PWM

This route is located to the east and southeast of the Site and passes within 6.7km of the nearest proposed turbine. The is partial and full theoretical visibility indicated along the stretch of the route from Limerick City to Cloonlara in Co. Clare, with largely no theoretical visibility north of this point, and in particular no theoretical visibility where the route passes by Lough Derg. Photowires PWT and PWZ, as well as viewpoint VP6, are representative of the most open types of views from the section of the route within Limerick City, with limited views of the proposed turbines, which are seen as distant background elements in any case. Even though the ZTV indicates full theoretical visibility for the part of the route approaching Cloonlara from the southwest, there are likely to be no or very limited views of turbines from this part of the route, given the level of vegetation in the landscape that screens views of the proposed turbines. This is demonstrated by photowire PWO, which shows the effect that treelines within the landscape have on visibility of the proposed turbines at locations where full theoretical visibility is indicated. Photowire PWM is also located along this route, with very limited visibility of the proposed turbines shown in this view. Viewpoint VP15 is located at a similar geographic orientation and distance from the proposed turbines as the section of the route with theoretical visibility near Parteen Weir, located 7.3km east of the nearest proposed turbine. The sensitivity of VP15 was determined to be 'Low', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Not Significant**'. Overall, views of the proposed turbines will be extremely limited from along this waymarked route.

O'Briensbridge – Parteen Weir: VP15

There is primarily full theoretical visibility of the proposed turbines from along this route. There is a large amount of vegetation bordering the banks of the River Shannon and the path that this route follows. A high raised bank will prevent views from the southeastern half of the route, with views of the proposed turbines possibly occurring from the northwestern half of the route, from the raised bank

following the river. Viewpoint VP15 is located at a similar geographic orientation and distance from the proposed turbines as the route, located 7.3km east of the nearest proposed turbine. The sensitivity of VP15 was determined to be 'Low', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and **'Not Significant'**.

Mid Clare Way: PWW, VP9
A large portion of this route has theoretical visibility of the proposed turbines. In reality, site visits determined that while there will be instances of visibility along the sections of this route within the wider LVIA Study Area, views of the proposed turbines will be well-screened with the proposed turbines seen as small features in the background of views. This is demonstrated by photowire PWW which shows an open view towards the proposed turbines from a location in close proximity the route. Viewpoint VP9 is also located at a similar geographic orientation and distance from the proposed turbines as this route. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Graves of the Leinster Men Looped Walk/Arra Mountain Loop: PWM
There is partial theoretical visibility along the same section of these walking routes where they overlap, with primarily no theoretical visibility along the other parts of these routes. Photowire PWM shows a view from this location with partial theoretical visibility and as can be seen from that photowire in Appendix 14-5, there is only visibility of the blade tips of three turbines likely to occur from this viewpoint. The views from this location (PWM) represent receptors of 'High' Sensitivity, and the magnitude of change is 'Negligible'. Given the very small extent of the proposed turbines in these views, and the distances involved, residual visual effects are deemed to be Long-term and '**Not Significant'**.

King John's Castle: VP6, PWZ There is partial theoretical visibility indicated for King John's Castle, with viewpoint VP6 located on Thomond Bridge, in front of the castle, where there are unobstructed views representative of views from the castle itself, towards the proposed turbines. The sensitivity of VP6 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'. This represents one of the most open views of the Proposed Development from the area around King John's Castle, and this level of visibility reduces quickly with a change in location (e.g. see photowire PWZ which is located only on the eastern side of the same bridge).

Bunratty Castle and Folk Park: PWY, VP9
Bunratty Castle is located 11.4km from the nearest proposed turbine and has full theoretical visibility. Photowire PWY is located on the bridge in Bunratty, adjacent to the Castle, and shows that the proposed turbines will be visible from locations around the tourist destination. The view of turbines is similar to that seen in viewpoint VP9 which is located 2.6km northwest, and is at a similar geographic orientation and distance from the proposed turbines as Bunratty. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'.

Other Visual Receptors – Major Transport Routes

Of the 11 major transport routes identified within the LVIA Study Area, two routes were scoped out previously in Section 14.5.2 'Visual Receptor Preliminary Analysis'. Viewpoints were selected for the remaining transport routes identified. All the viewpoints below are discussed in greater details above and in the photomontage assessment tables contained in Appendix 14-3: *Photomontage Assessment Tables*. The RSA undertaken above in Section 14.3.3 details the likely visibility of the roads surrounding the Wind Farm Site, including smaller local roads; there are no 'Significant' effects deemed likely to arise in relation to these transport routes.

R465: VP1, VP4, VP15, PWE, PWD, PWF
The R465 regional road runs in a north-south direction, beginning Ardnacrusha, passing to the east of the Eastern Cluster of proposed turbines (located approx. 570m from turbine T9 at its closest point) and

continuing on to Broadford and Bodyke, joining the R352 regional road at a location 11.7km north of the nearest proposed turbines. There are large portions of the route with theoretical visibility of the proposed turbines. Viewpoint VP1 is located along the route, within Broadford. The sensitivity of VP1 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'. Photowires PWD, PWE, and PWF are also located along this road, at locations within 1.5km of the Eastern Cluster. All three photowires (see Appendix 14-5) demonstrate the scale of the proposed turbines from locations within close proximity to the Eastern Cluster. Notably, only the Eastern Cluster of proposed turbines are visible from these locations. These locations represent the most open views available from this part of the route in close proximity to the proposed turbines, with the RSA seen above in Figure 14-3 showing that, along the parts of this route located within 5km of the proposed turbines, there is primarily 'Intermittent/Partial Screening' or 'Full Screening' along the roadside. This means that views towards the proposed turbines will be intermittent from locations along the road itself and residual visual effects are **'Not Significant'.** Considering all of the above factors, including the visual impact assessment presented in Appendix 14-3: *Photomontage Assessment Tables* for VP1, there will be no significant visual effects that arise in relation to this receptor.

R466: VP4, VP1, PWB, PWC

The R466 regional road connects Birdhill to the east of the Wind Farm Site, with Tulla, to the northwest of the Site. The route passes through Broadford and O'Briensbridge, passing within 1.9km of the Eastern Cluster of proposed turbines at its closest point. There are large tracts of theoretical visibility along the route. Viewpoint VP1 is located along this route, within Broadford. The sensitivity of VP1 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'. Viewpoint VP4 is also located along this road. The sensitivity of VP4 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight'**. Photowires PWB and PWC are also located along this road, at locations to the east of the Eastern Cluster and show very low levels of visibility of the proposed turbines, even from these locations between 3–4km from the nearest proposed turbines. The RSA seen above in Figure 14-3 shows that, along the parts of this route located within 5km of the proposed turbines, there is primarily 'Intermittent/Partial Screening' or 'Full Screening' along the roadside. This means that views towards the proposed turbines will be intermittent from locations along the road itself and visual effects are Long-term and '**Not Significant'**. Considering all of the above factors, including the visual impact assessment presented in Appendix 14-3 for VP1 and VP4, there will be no significant residual visual effects that arise in relation to this receptor.

R471: VP12, VP15, PWV

The R471 regional road connects Cloonlara with Sixmilebridge, passing to the south of the Wind Farm Site in an east-west orientation. There is primarily full theoretical visibility indicated along this stretch of road. Viewpoint VP12 is located along this road. The sensitivity of VP12 was determined to be 'Medium', with a 'Moderate' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Moderate**'. Viewpoint VP15 is also located along this road, at a slightly larger distance from the nearest proposed turbine. The sensitivity of VP15 was determined to be 'Low', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Not Significant'**. Photowire PWV is also located along this road, showing a view from a location near to the Western Cluster of proposed turbines. A large stretch of R471 was also route-screened, the results of which can be seen above in Figure 14-3. The analysis recorded large stretches of 'Full Screening', as well as 'Little/No Screening', with patches of 'Intermittent/Partial Screening' within these stretches. This indicates that there will be some views of the proposed turbines from along the route, as demonstrated by the VPs located along the road, however, there will also be large stretches of the road where the proposed turbines will be screened from view. Considering all of the above factors, including the visual impact assessment presented in Appendix 14-3 for VP12 and VP15, there will be no significant residual visual effects that arise in relation to this receptor.

M18/N18: VP9, PWY

The N18 national road and M18 motorway are part of the same route, travelling as M18 from the northwest border of the LVIA Study Area, southwards towards Shannon, where the route turns into

N18, continuing southeast to Limerick City. There are large stretches of the route with full and partial theoretical visibility. Viewpoint VP9 is located close to the route, where it is located closest to the proposed turbines and where there is theoretical visibility. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'. Photowire PWY is located on the bridge in Bunratty, along N18, and shows that the proposed turbines will be visible from locations along this part of the route. The view of turbines is similar to that seen in VP9, which is located 2.6km northwest, and is at a similar geographic orientation and distance from the proposed turbines as PWY. Considering all of the above factors, including the visual impact assessment presented in Appendix 14-3 for VP9, there will be no significant residual visual effects that arise in relation to this receptor.

M7: VP5

The M7 motorway enters the LVIA Study Area to the east of the proposed turbines, travelling southwest towards Limerick City, passing through large stretches of full theoretical visibility. Viewpoint VP5 is located along a regional road adjacent to the motorway and represents views from the motorway where it enters Limerick City. The sensitivity of VP5 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Not Significant'**.

M20: VP6, PWR

The M20 motorway enters the LVIA Study Area from the southwest, travelling northeast toward Limerick City. Site visits determined that there would be limited occasions along this route where views of the proposed turbines would be available. Viewpoint VP6 is located at a similar geographic orientation as the road, although it is located 3.2km closer to the proposed turbines than the closest point along the motorway. The sensitivity of VP6 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Slight**'. M20 is a 'Low' sensitivity receptor, although the type of view shown in VP6 is likely to occur from some limited locations along the road. Given the likely level of visibility from the road outlined here, and the residual visual effect determined to arise at VP6, there will be no significant residual visual effects that arise in relation to this receptor.

N24: VP5

The N24 national road enters the LVIA Study Area from the southeast, travelling northwest toward Limerick City. Site visits determined that there would be limited occasions along this route where views of the proposed turbines would be available. Viewpoint VP5 is located at a similar geographic orientation as the road, although it is located 2.1km closer to the proposed turbines than the closest point along the road. The sensitivity of VP5 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term and '**Not Significant'**. Given the likely level of visibility from the road outlined here, and the residual visual effect determined to arise at VP6, there will be no significant residual visual effects that arise in relation to this receptor.

N19: VP9

The N19 national road originates in Shannon Airport and travels northeast toward N18, through the settlement of Shannon. The route has large stretches of theoretical visibility of the proposed turbines, although this visibility will be greatly reduced within Shannon due to screening from built infrastructure, there may be some locations along the road where views of the proposed turbines will occur. Viewpoint VP9 is located at a similar geographic orientation and distance as the closest point along this road. The sensitivity of VP9 was determined to be 'Medium', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be Long-term **'Slight'**. Given the likely level of visibility from the road outlined here, and the residual visual effect determined to arise at VP9, there will be no significant residual visual effects that arise in relation to this receptor.

14.7.3.3.4 Residential Visual Amenity

During the site selection process, early-stage LVIA appraisals identified local residential receptors as one of the most sensitive receptors with the greatest potential to be adversely impacted by the proposed turbines with regard to visual impacts. Consequently, residential visual amenity was of key consideration during site selection and throughout the iterative design process for the Proposed Development. This section of the LVIA firstly states how design measures have been used to mitigate the potential for significant visual effects on some areas of residential amenity, then gives an overview of the residential context in terms of population density in the surrounding area and the geographic arrangement of residential receptors in close proximity to the Site. Finally, a visual impact assessment of each cluster of residences is reported, these assessments use analysis of aerial maps, photomontages and photowire visualisations with the intention of identifying the worst-case scenario for potential visual effects on residential receptors.

The Proposed Development design process has been informed by set-back distances, with regard to the siting of turbines in proximity to residential receptors, the Proposed Development adheres to the recommended 500m set-back distance in the WEDGs (DoEHLG, 2006) and also the 4 times tip height set-back distance set out for residential visual amenity prescribed by the Draft Revised WEDGs (DoHPLG, 2019). The Proposed Development includes for a set-back distance greater than 750 metres from residential receptors, a distance greater than 10m beyond the minimum recommendations in the WEDGs (4 × Tip Height at 185m = 740m).

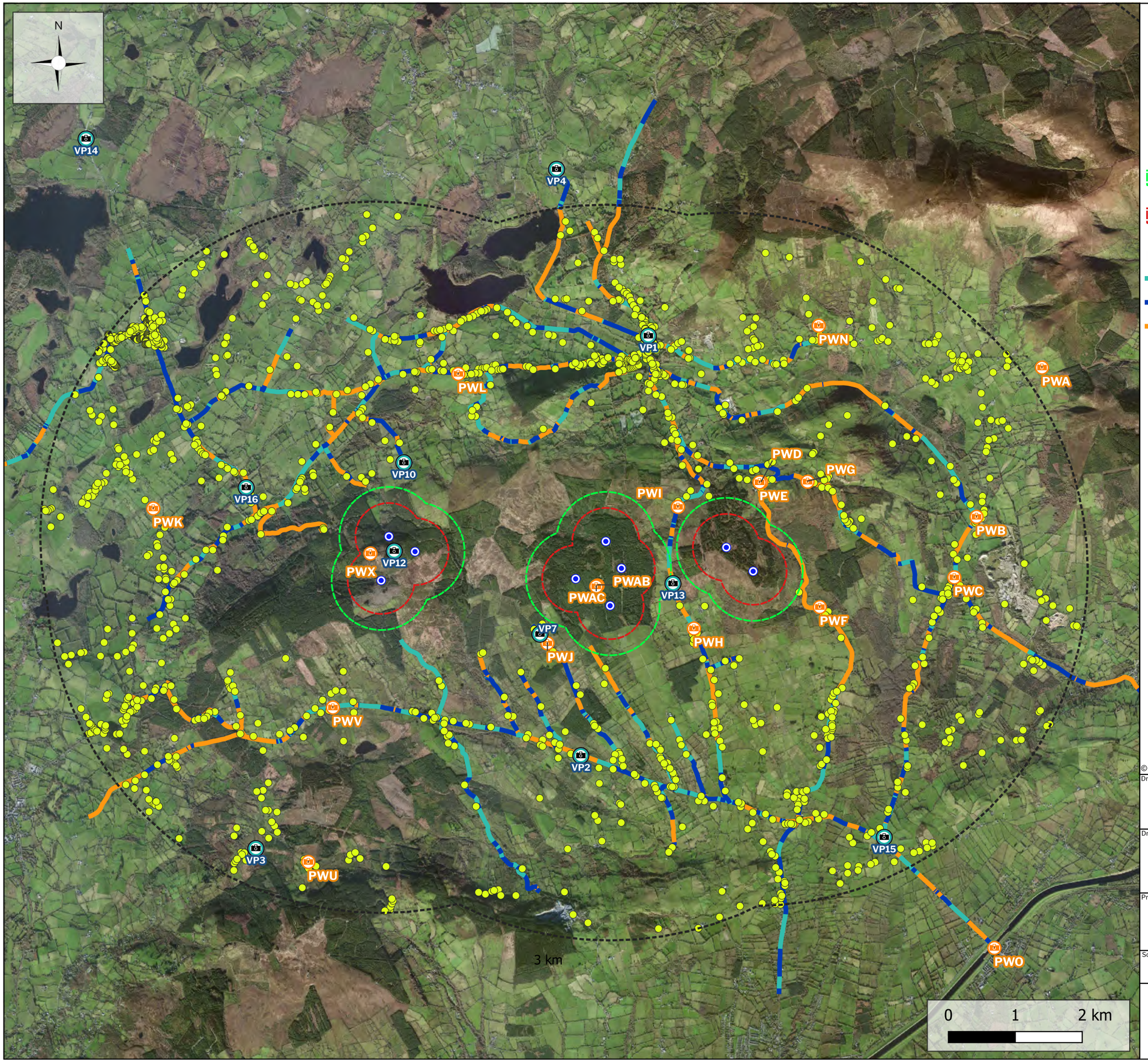
Residential Context – Population Density and Arrangement of Dwellings

As reported in the landscape baseline (see Section 14.4.2 'Landscape Character of the Site'), the Wind Farm Site is a large, uninhabited area characterised primarily by commercial forestry. Figure 14-26 below illustrates how the proposed turbines are set-back from residential receptors in the surrounding landscape and that the distances are compliant with the guidance in the WEDGs and Draft Revised WEDGs (DoEHLG, 2006; DoHPLG, 2019).

The populations of the 4 No. Electoral Divisions (ED)s within and surrounding the Wind Farm Site are detailed in Chapter 5: 'Population and Human Health' of this EIAR. As shown in Table 5-2 of Chapter 5, the population density of EDs, recorded during the 2022 Census was 24.22 persons per km^2. This figure is significantly lower than the national population density of 73.27 persons per km^2 and the Co. Clare population density of 34.44 persons per km^2. These findings indicate that the landscape surrounding the Wind Farm Site has a relatively low population density.

There are 16 No. residential receptors located within 1km of the proposed turbine locations. The closest residential receptor is located greater than 750m from the nearest proposed turbine i.e., over 4-times-tip-height set-back distance (4 × Tip Height at 185m = 740m).

As shown by the Residential Visual Amenity map below (Figure 14-26), the clusters of nearby residential receptors in closest proximity to the proposed turbines are arranged along a network of small local located around the Wind Farm Site. The map illustrates locations where photomontage and photowire imagery was captured to inform the impact assessment of the residential clusters surrounding the Wind Farm Site.



Map Legend

- Proposed Turbines
- Residential Receptors
- Photomontage Viewpoint Locations Volume 2 Booklet
- Photowire Viewpoint Locations Appendix 14-5
- Set-Back Distance Compliance 740m (4 x Tip Height (185m) (DoHPLG, 2019)
- Set-Back Distance Compliance 500m (DoEHLG, 2019)

Route Screening Analysis

- No / Very Little Screening
- Partial / Intermittent Screening
- Dense / Full Screening

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Drawing No.

Figure 14-26

Drawing Title

Residential Visual Amenity

Project Title

Knockshanvo Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:55,000	200513	23.04.2024	JW	JS

MKO

Assessment of Residential Amenity – Photomontages

A large number of viewpoints (5 of the 16 No.) were taken within 3km of the proposed turbines, with an additional 3 No. viewpoints located between 3–5km from the Wind Farm Site, amounting to a total of 8 of 16 No. viewpoints within 5km of the proposed turbines (along with 13 No. photowire viewpoints not ultimately brought forward as photomontages located within this area as well; these can be seen in Appendix 14-5).

Photomontages are one of the many tools employed during LVIA in order to inform the assessment of landscape and visual effects. It would be a disproportionate measure to include an individual photomontage from all individual residential receptors; further, this is not required to conduct a thorough and robust assessment of landscape and visual effects. In line with the guidance laid out in the GLVIA3 (LI & IEMA, 2013), the viewpoints selected for this LVIA were informed by a range of factors including the *"ZTV analysis, by fieldwork, and by desk research"* (para 6.18 in 'Assessment of Visual Effects', GLVIA3, p.109). Furthermore, the GLVIA3 states that representative viewpoints are to be *"selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ"* (para 6.19, GLVIA3). The large number of viewpoints used to conduct the LVIA particularly in very close proximity to the proposed turbines is sufficient to represent all residential receptors within the LVIA Study Area, including the *"distribution of population"* (para 6.18, GLVIA3).

Residential Receptors within 1.5km of the Proposed Turbines

The following townland receptors are located within 1.5km of the proposed turbines: Kilmore, Crag, Snaty (Wilson) Gortnaglogh, Cappanaslish, GortaCullian, Ballykelly, Knockshanvo, Snaty (Massy) Muingboy, Gyleglass, Cloontra West, Drumsillagh or Sallybank, Mountrice, Cloghoolia, Hurdleston, Snaty (Cooper), Formoyle Beg, Cloontra, Clloontra East, Oatfiled, Crean, Formoyle More, and Kyle.

Viewpoint VP13 is located approximately 800m southeast of the nearest proposed turbine of the Central Cluster, and is representative of the two residential receptors located along the local road situated between the Eastern and Central Clusters. In relation to these receptors, the Proposed Development adheres to the recommended 500m set-back distance in the WEDGs (DoEHLG, 2006) also the 4-times-tip-height set-back distance set out for residential visual amenity prescribed by the Draft Revised WEDGs (DoHPLG, 2019). The sensitivity of this viewpoint was deemed to be 'High' on account of the residential receptor in close proximity to the proposed turbines, and the magnitude of change was deemed to be 'Substantial'. A Long-term residual visual effect of '**Significant**' was deemed to arise in relation to the receptors located adjacent to the viewpoint, which comprise two properties. It is also noted that whilst the proposed turbines do constitute a 'Substantial' change in one area of residential visual amenity, they do not comprise a large horizontal extent of views (<52° of 360°, equating to 14% of the horizontal field of view), as the Eastern Cluster of proposed turbines is not visible from this location. One additional photowire (PWH) was captured approximately 750m further south along the road than VP13, 1.2km southwest of the nearest proposed turbine (T9 of the Eastern Cluster). The field structure, vegetation, and other landscape elements seen throughout the view act as a physical landscape buffer and provide a sense of scale in relation to the set-back distance of the turbines, with turbines viewed as sited beyond multiple fields or behind treelines and tracts of forestry. The turbines appear as smaller objects at this set-back distance, and are seen within a small horizontal extent of the view, with residual visual effects reducing to Long-term '**Moderate**' at this distance for the residential receptors located adjacent to this viewpoint.

Plate 14-26 View from the Location of Photowire PWH

Photowire PWI shows a view from the same local road as in PWH, but from a location 1.1km north of VP13, beside a number of residential receptors located within 1.5km of the nearest proposed turbine (T8 of the Eastern Cluster). From both this location and PWH, shown above, there are potential views of two proposed turbines clusters. These two clusters are seen within a 110–120° horizontal extent of view from both of these viewpoints, although it can be seen that there are high levels of vegetative screening in both cases, demonstrating the general screening effect that occurs as a result of the landcover in the area surrounding these residential receptors.

Plate 14-27 View from the Location of Photowire PWI

Photowire PWF, as well as photowires PWD and PWE, show views from locations along the R465 regional road to the northeast and southeast of the Eastern Cluster of proposed turbines. Views of the proposed turbines from both of these locations, located adjacent to the closest residential receptors to the proposed turbines in these directions, show that there is visibility of just the Eastern Cluster of proposed turbines from this area. The proposed turbines are viewed as set-back, beyond treelines and tracts of forestry, partially screened by intervening topography and other vegetation and forestry seen within these views. Views of the proposed turbines are within a very limited horizontal extent.

Viewpoint VP7 is located to the southwest of the Central Cluster of proposed turbines, within a cluster of residential receptors located along a small local road that leads into the Wind Farm Site. In relation to these receptors, it is emphasised that the Proposed Development adheres to the recommended 500m set-back distance in the WEDGs (DoEHLG, 2006) also the 4-times-tip-height set-back distance set out for residential visual amenity prescribed by the Draft Revised WEDGs (DoHPLG, 2019). The sensitivity of this viewpoint was deemed to be 'High' on account of the residential receptor in close proximity to the proposed turbines, and the magnitude of change was deemed to be 'Substantial'. A residual visual effect of Long-term **'Moderate'** was deemed to arise in relation to the receptors located adjacent to the viewpoint. It is also noted that whilst the proposed turbines do constitute a 'Substantial' change in one area of residential visual amenity, they do not comprise a large horizontal extent of views (<52° of 360°, equating to 14% of the horizontal field of view). This viewpoint is directed east, towards the Central Cluster of turbines and away from the Western Cluster of turbines. While this viewpoint is actually located directly between the Central and Western Clusters of turbines, the Western Cluster (T1, T2, and T3) is not actually visible from this location as a result of screening provided by the topography and vegetation.

Photowire PWJ is also located along this road and shows the level of screening present along the roadside, which will provide a substantial screening effect in relation to receptors located on the western side of this road, which applies to 5 out of the 7 No. residential receptors represented by VP7.

Plate 14-28 View from the Location of Photowire PWJ

Viewpoint VP10 is located 1.1km northeast of the nearest proposed turbine of the Western Cluster (T2) and represents views from several residential receptors located within 1.5km of the Western Cluster to the north. In relation to these receptors, it is again emphasised that the Proposed Development adheres to the recommended 500m set-back distance in the WEDGs (DoEHLG, 2006) also the 4-times-tip-height set-back distance set out for residential visual amenity prescribed by the Draft Revised WEDGs (DoHPLG, 2019). The sensitivity of this viewpoint was deemed to be 'High' on account of the residential receptor in close proximity to the proposed turbines, and the magnitude of change was deemed to be 'Moderate'. A Long-term residual visual effect of '**Moderate**' was deemed to arise in relation to the receptors located adjacent to the viewpoint. It is also noted that whilst the proposed turbines do constitute a large change in one area of residential visual amenity, they do not comprise a large horizontal extent of views (<17° of 360°, equating to 5% of the horizontal field of view). There are views of the Western Cluster of proposed turbines only from this location and the area represented by it. In addition, it is noted that the primary views for receptors located in this area will be to the north, down the hill, and over the expansive landscape in view away from the proposed turbines.

As seen from Figure 14-26 above, there are two additional residential receptors located to the northwest of the Western Cluster, within 1km of the nearest proposed turbines. Neither of these receptors, as determined during a site visit, will have views of the proposed turbines given the very high level of vegetative screening surrounding these properties (screening existent both on the properties themselves and in the form of the surrounding forestry).

Residential Receptors beyond 1.5km of the Proposed Turbines

As can be seen in Figure 14-26 above, between 1.5km and 3km from the nearest proposed turbine, the local roads surrounding the Wind Farm Site have primarily mixed classes of 'Partial/Intermittent Screening' and 'Full Screening' with limited instances of 'Little/No Screening', meaning that views of proposed turbines from these roads and residential receptors located on these roads will, in general, be intermittent.

Viewpoint VP12 is located 2.2km south of the nearest proposed turbine (T7 of the Central Cluster), representing the residential receptors along the R471 regional road that runs in an east-west orientation to the south of the Site. This viewpoint shows that the scale of proposed turbines drastically reduces with distance. Residential receptors here have been assigned a 'Medium' sensitivity with a 'Moderate' magnitude of change. The overall residual effect is deemed to be Long-term and **'Moderate'**. One additional photowire (PWV) was captured along this road to represent residential receptors, located closer to the Western Cluster of proposed turbines. As can be seen in Plate 14-29 below (see also Appendix 14-5), the proposed turbines are visible, but with the majority of turbines well-screened by topography, and with additional screening by the treelines bordering the fields.

Plate 14-29 View from the Location of Photowire PWV

For residential receptors located beyond 1.5km of the nearest proposed turbine, the effects on residential visual amenity are dramatically reduced in comparison to the closer receptors identified above in Figure 14 17, with topography and screening in the landscape having a greater screening effect at these distances. This is further evidenced by the assessment of viewpoint VP16, located 2.3km from the nearest proposed turbines and representative of the residential receptors located west of the Western Cluster of proposed turbines. This viewpoint was deemed to have a 'Medium' sensitivity, with a 'Moderate' magnitude of change, with the residual visual effect of Long-term and '**Slight**'. This is also evidenced by photowire PWC, located 3km east of the Eastern Cluster of proposed turbines.

In summary, the highest effects on residential visual amenity will occur in relation to a relatively small number of receptors located within 1km of the proposed turbines (see viewpoints VP7 and VP13), with the scale of turbines in view reducing quickly from locations further from the Site. Beyond 1.5km from the Site (see viewpoint VP10 and photowires PWF and PWH), the scale of the turbines reduces substantially. In addition, the viewpoints located between 3–5km from the nearest proposed turbine (viewpoints VP12 and VP16) show that effects on residential receptors will be dramatically reduced in comparison to the closer receptors identified above in Figure 14-26. It is relevant then, that the population density, recorded during the 2022 Census as 24.22 persons per km^2, is lower than the national population density and the Co. Clare population density. As the area surrounding the Wind Farm Site has a low population density, site selection for the proposed turbines has resulted in reduced effects on residential visual amenity than might otherwise be the case.

14.7.3.3.5 *Visual Effects Relating to the Proposed Grid Connection*

The proposed Grid Connection cable route is located underground; therefore, no visual effects are deemed to arise from it during the operational phase. The Grid Connection cable route is connected to the proposed 110 kV on-site substation that, as reported above, is well-screened by existing forestry surrounding the substation.

14.7.3.4 Cumulative Visual Effects

There are many potential scenarios and interactions where cumulative visual effects may occur. These scenarios include interactions between the Proposed Development, other energy developments (wind farms or grid infrastructure), as well as other man-made landscape features (quarries, transport networks and overhead telecommunication lines) and land uses. Guidance for the assessment of cumulative effects of onshore wind farms (SNH, 2012; NatureScot, 2021) clearly states the following:

> *'At every stage in the process the focus should be on the key cumulative effects which are likely to influence decision making, rather than an assessment of every potential cumulative effect';*
>
> *'The level of information generated can distract attention from the most significant cumulative effects which are likely to influence the consenting decision. Assessments should therefore focus on the most significant cumulative effects and conclude with a clear assessment of those which are likely to influence decision making'.*

Following this guidance, a primary focus is given to the cumulative effects likely to occur as a result of other wind turbines identified in the LVIA Study Area. Cumulative visual effects were assessed as part of the Appendix 14-3: *Photomontage Assessment Tables*. Whether a visual effect is deemed to be positive, negative or neutral, this involves a degree of subjectivity. What appears to be a positive effect to one viewer could be deemed to be a negative effect by another viewer. All predicted visual effects of the viewpoints below are considered 'Long-Term', 'Direct' effects.

There are 8 No. additional existing, permitted and/or proposed wind farms located within 20km of the proposed turbines. These wind farms are located in separate clusters to the east (permitted Carrownagowan, proposed Lackareagh, and permitted Fahy Beg) and south (proposed Ballycar, and existing single Vistakon and single Parteen turbines) of the Proposed Development. A cumulative comparative ZTV showing all additional turbines with the proposed turbines was shown previously in Figure 14-21. Notably, the addition of the proposed turbines gives rise to only very small additional areas (shown in the figure in light green) where theoretical visibility of turbines occurs as a result of the Proposed Development. Whilst the cumulative ZTV is a useful tool to identify where, in a general sense, an entire development can or cannot be seen, the magnitude and nature of cumulative visual effects are better comprehended through analysis of photomontages; therefore, please refer to the comprehensive analysis and discussion of cumulative visual effects of each photomontage in Appendix 14-3.

Cumulative Visual Effects with the Permitted Carrownagowan Wind Farm: Overview

The permitted Carrownagowan turbines are sited on the northern slope of Slieve Bernagh and this landform screens them from view from most receptors to the south of this mountain. Most receptors in close proximity to the Proposed Development (within 5km) will have no in-combination views of the Proposed Development and permitted Carrownagowan turbines. The greatest potential for cumulative visual effects with the proposed turbines are likely to arise where the permitted Carrownagowan turbines are seen in combination from receptors located in the undulating plain to the north-west of the Slieve Bernagh Uplands – north of the LVIA Study Area i.e. greater than 5km away. The cumulative photomontage from Viewpoint VP11 shows distant combined views which would be experienced from receptors within this landscape to the north of the LVIA Study Area (albeit further set back).

Viewpoint 4 is located on designated scenic route SR-25 approximately 5.5km north of the Central Cluster of the Proposed Development and approximately 3.5km west of the nearest permitted Carrownagowan turbine. Both wind farms are separated from each other by a distance of approximately 8km. Some minor visibility of the most westerly permitted Carrownagown turbines maybe be perceptible from this viewpoint. However, their visibility is limited by landform and vegetative screening. There will be some combined in succession (where an observer has to turn their head to see another development) views of these turbines along with those of the Proposed Development from areas on the scenic route to the north of this viewpoint. There will be turbines visible in two directions from receptors represented by this viewpoint and there will be some additional cumulative visual effects arising as a result. However, there will be a large horizontal extent of the view available from this location (comprising approx. 220 degrees) where there will be no turbines visible. Considering this factor, and the large separation distance between the permitted Carrownagowan turbines and the proposed turbines that are visible (approx. 8km), the combined views do not give rise to substantial or significant cumulative visual effects.

Cumulative Visual Effects with the Proposed Oatfield Wind Farm: Overview

The greatest potential for significant cumulative visual effects arise where the Proposed Development is visible in combination with the proposed Oatfield Wind Farm. However, it is worth noting that there is a degree of uncertainty to this scenario arising, as the likelihood of the proposed Oatfield turbines causing visual effects in combination with the Proposed Development in the landscape is reliant on an outcome of the consenting process, amongst other factors. The proposed Oatfield turbines are generally seen in combination with the Central and Western Clusters of the Proposed Development

and increase the density of turbines visible in that area of upland, as well as increase the magnitude of visual change. In a general sense, the large-scale upland landscape can effectively absorb both developments, particularly when viewed from receptors in the wider landscape beyond distances of 5km (e.g. VPs: 4, 5, 6, 8, 9, 11, 14). A comprehensive analysis and assessment of visual interactions between the proposed Knockshanvo and proposed Oatfield turbines evident within each cumulative photomontage is included in Appendix 14-3, however some discussion on the key analysis is included as follows.

The turbines of the Proposed Knockshanvo Development are sited upon the most elevated areas of the landform which extends East-West across the landscape and includes the three peaks of Knockanuarha, Knockshanvo and Drumsillagh. Four No. proposed Oatfield turbines adjoin the Knockshanvo Central Cluster of turbines at a similar elevation, east of the peak at Seefin. The 6 No. Knockshanvo turbines of the Western Cluster are situated directly to the south; therefore, the greatest cumulative effects with the Oatfield turbines generally occur in that direction. Some key observations are outlined below in relation to different receptors from various geographical perspectives experiencing the greatest cumulative views as illustrated by the 'Cumulative View' photomontages presented in the photomontage booklet.

Views from the South: Cumulative effects with proposed Oatfield turbines

- VP2 – Derryvinnan (South): Potential for cumulative visual effects on residential receptors south of the Knockanuarha ridgeline. The proposed Knockshanvo turbines have a much greater set-back distance from the receptors in this area (i.e., the townlands of Derryvinnan) than the proposed Oatfield turbines; therefore, the Knockshanvo turbines have a lesser contribution to these cumulative visual effects.
- VP3 – Clogga (South-South-West): Potential for cumulative visual effects on designated scenic route SR-22. From this viewpoint the turbines are seen to be of similar scale, viewed collectively upon the same elevated landform in the background of the view. The proposed turbines are visible beyond the Oatfield turbines which are located in closer proximity to this viewpoint. Although some minor cumulative visual effects could potentially arise, the turbines as a collective (Knockshanvo and Oatfield) will have limited effect on the key scenic sensitivities of the designated scenic route near this viewpoint.
- VP08 – Sixmilebridge (South-West): Potential for cumulative visual effects on receptors in and around the settlement of Sixmilebridge. Seven proposed Oatfield turbines are seen across the ridgeline in the centre of the photomontage above the Proposed Development turbines. Cumulative visual effects can potentially occur in combination with the proposed Oatfield turbines. The proposed turbines of the western cluster are effectively absorbed amongst the proposed Oatfield turbines, appearing as one collective turbine cluster. The contribution of the proposed Knockshanvo wind farm to these cumulative effects is minimal.
- VP15 – Tooreen (South-East): Potential for cumulative visual effects on residential receptors and users of the R471 Regional Road. Cumulative effects have the potential to arise with the proposed Oatfield turbines as a greater density and wider extent of turbines are visible across the upland area.

Views from the North: Cumulative effects with proposed Oatfield turbines

- VP01 Broadford (North-North-East): Potential for cumulative visual effects on receptors to the north of Broadford (elevated locations only): The cumulative photomontage shows the proposed Oatfield turbines are likely to be seen in front of the three turbines of the Central Knockshanvo cluster. Cumulative visual effects occur, although the contribution of the proposed turbines to cumulative effects on receptors in Broadford and at this viewpoint is minor as they are predominantly screened from view.

- VP 4 Moanogeenagh (North): Potential for cumulative visual effects on designated scenic route SR-25. The proposed Oatfield turbines are well absorbed amongst the turbines of the Proposed Development, creating two slightly denser turbine clusters on the elevated ridgelines in the background of the view – causing some minor but acceptable cumulative effects.
- VP14 Ballyblood (North-West): Potential for cumulative visual effects on designated scenic route SR-24. Seven proposed Oatfield turbines are seen across the ridgeline in the centre of the photomontage either side of the proposed turbines of the Western Cluster. The proposed turbines of the Western Cluster are effectively absorbed amongst the proposed Oatfield turbines, appearing as a coherent array of turbines across the upland area from this viewpoint.
- VP16 Belvoir (North-West): Potential for cumulative visual effects on residential receptors to the north-west of the Western Cluster. Three turbines of the proposed Oatfield turbines are visible to the right (west) of turbine T01. They are of similar scale and assimilate well with the three turbines of the western cluster which are visible from this viewpoint. The visible turbines of Oatfield and the Proposed Development read coherently in the landscape as one collective turbine cluster from this viewpoint.

In general, in the flat, heavily vegetated landscape that makes up much of the LVIA Study Area beyond the Slieve Bernagh Uplands, there is reduced visibility of both the proposed Oatfield turbines and the proposed turbines from locations beyond 5km from the turbines. This has been demonstrated throughout the discussion of visual effects previously in this chapter, and in Appendix 14-3 as well as the *Photomontage Booklet*.

It is noted that both the proposed turbines and the proposed Oatfield Wind Farm are located within designated 'Strategic Area's and areas designated as 'Acceptable in Principle' for wind energy development in the local planning policy (recall Section 14.4.1.1.1). In addition, both the proposed turbines and proposed Oatfield Wind Farm are located within the Landscape Character Type of 'Mountain Moorland' (as reported from local planning policy in Section 14.4.1.1.1). The WEDGs guidance for the siting and design of wind energy developments in relation cumulative effects within this landscape type is as follows (DoEHLG, 2006):

> *'The open expanse of such landscapes can absorb a number of wind energy developments, depending on their proximity. The cumulative impact will also depend on the actual visual complexity of landform, whether steeply rolling, undulating or gently sweeping. The more varied and undulating an area is topographically, the greater its ability to absorb and screen wind energy developments. The aesthetic effect of wind energy developments in these landscapes is acceptable where each one is discrete, standing in relative isolation'.*

The guidance suggests that views of the proposed turbines along with the Oatfield Wind Farm will, in general, be acceptable aesthetically speaking within this landscape type, which is undulating and large in scale, allowing it to absorb multiple wind energy developments.

Cumulative Visual Effects from the Summit of the 12 O'Clock Hills – Viewpoint 12

As demonstrated by the cumulative photomontages for Viewpoint 12, there is a substantial number of turbines visible in multiple directions in combination with the Proposed Development. The proposed turbines are visible in combination with many other developments including permitted Carrownagowan, permitted Fahy Beg, proposed Oatfield, proposed Lackareagh, and proposed Ballycar.

Whilst the cumulative changes to the landscape and visual amenity from this viewpoint is substantial, this is an outcome to be anticipated and is in line with local planning policy, considering that (i) the Proposed Development is sited in lands designated as a 'Strategic Area' for wind energy development, and (ii) the Slieve Bernagh Uplands is an LCA designated as a suitable landscape capable of absorbing

wind energy development in East Clare (CWES). It is to be again noted that the cumulative effects with other proposed developments (e.g. Oatfield, Lackareagh, Fahy Beg, Ballycar) is uncertain and reliant upon outcomes of the consenting system, amongst other factors.

The provision of new recreational amenities as part of the Proposed Development (described in Section – 14.1.3.4) have been designed in mind of the potential for cumulative effects as well as the impacts of the Proposed Development in and of itself. The proposed viewpoint amenities to the north of the site provide unobstructed visual amenity across the landscape in a northerly direction, unhindered by both turbines of the Proposed Development and other cumulative developments, offsetting cumulative visual effects occurring at the existing viewpoint at the 12 O'Clock Hills Summit (VP12).

Cumulative Visual Effects with Proposed Developments in the Glenomra Valley to the East: Proposed Lackareagh and Permitted Fahy Beg.

In a potential future receiving environment turbines of the proposed Lackareagh Wind Farm and permitted Fahy Beg Wind Farm would be located within the Glenomra Valley to the east of the Eastern Cluster of the Proposed Development. The Glenomra Valley is a relatively enclosed 'inverted L-shaped' valley which provides visual containment. The western side of the valley generally provides a lot of visual screening, obscuring views of the proposed turbines from receptors in this area. Visibility appraisals conducted for this LVIA, determined that there is likely to be very limited visibility of the Proposed Development, particularly from the designated scenic route and residential receptors which are located at lower elevation in this valley – hence why there are no photomontages included from this area in the photomontage booklet.

There are numerous photowires produced from within this valley (photowires PWB, PWC and PWN) showing that visibility of the proposed turbines is actually very limited from locations lower on the valley floor, where the most open views of cumulative turbines (Lackareagh and Fahy Beg) in the other direction will be available. Ultimately, the Proposed Development will have little to no contribution to potential cumulative visual effects on these receptors given that the main roads and settlement patterns are concentrated along the valley floor.

Open views of the proposed turbines are permitted from elevated locations on the eastern side of the valley, where there is a lower number of visual receptors present. Photowire PW-A was captured from a way marked walking trail (East Clare Way) where it passes between Glengalliagh Mountain and Lackareagh Mountain. This viewpoint is located between various turbines of the proposed Lackareagh Wind Farm and shows open and unobstructed views to the west towards the Proposed Development. Cumulative visual effects are likely to occur on this section of the walking trail (in an uncertain future receiving environment) where the proposed turbines are seen in combination with the proposed Lackareagh turbines.

There are combined views of the Proposed Development turbines and these cumulative turbines from locations close to the Wind Farm Site, such as viewpoint VP7, where the proposed Lackareagh and permitted Fahy Beg turbines can be seen in the background of the view, in the same direction as the proposed turbines (combined visibility). The sensitivity of this viewpoint was deemed to be 'High' on account of the residential receptor in close proximity to the proposed turbines, and the magnitude of change was deemed to be 'Substantial'. A residual visual effect of 'Moderate' was deemed to arise in relation to the receptors located adjacent to the viewpoint. This effect incorporates cumulative visual effects that arise at this viewpoint (see Appendix 14-3).

Cumulative Turbines to the South (Proposed Ballycar, Existing Vistakon, Existing Parteen)

The existing Vistakon and Parteen turbines are both small, single turbine development located within the flat landscape north of Limerick City and are rarely seen in combination with the proposed turbines. Due to their small scale, they have a very limited visual exposure and no significant cumulative visual effects are likely to occur in combination with the Proposed Development.

The proposed Ballycar turbines are located on the south-eastern edge of Woodcock Hill, and given their elevation, are generally seen in combination with the proposed turbines in views from the south (i.e. Limerick City), when views of the proposed turbines are available. Viewpoint VP6 is located within Limerick City, at Thomond Bridge where there are unobstructed views towards the proposed turbines. The sensitivity of VP6 was determined to be 'High', with a 'Slight' magnitude of change determined to arise. The residual visual effect was deemed to be 'Slight'. This effect incorporates cumulative visual effects that arise at this viewpoint (see Appendix 14-3). The proposed turbines are seen as further away, and as smaller elements in views from this part of the LVIA Study Area. See also viewpoint VP5.

From the west of the Ballycar turbines and the proposed turbines, there are limited actual combined views of these turbines. Viewpoint VP8 is located in Sixmilebridge, 7.6km to the west of Ballycar and 6.7km southwest of the proposed turbines. The sensitivity of VP8 was determined to be 'Medium', with a 'Negligible' magnitude of change determined to arise. The residual visual effect was deemed to be 'Not Significant'. This effect incorporates cumulative visual effects that arise at this viewpoint (see Appendix 14-3).

From many locations within the areas where there is theoretical visibility of both the proposed turbines and the Ballycar turbines, there will be no actual combined visibility of two developments, see viewpoint VP3 as an example. There were no locations identified where 'Significant' cumulative visual effects were determined to arise as a result of views of the proposed turbines and this grouping of cumulative turbines, with the cumulative visibility of both outlined here.

Conclusion – Cumulative Visual Effects

The Proposed Development turbines (excepting T02) are sited in a 'Strategic Area' for wind energy development in the Co. Clare Wind Energy Strategy (Volume 6 of the CCDP 2023–2029). The proposed turbines are therefore visible within an area of the landscape where it is envisioned for turbines to be seen, as guided by local planning policy.

As demonstrated by the mapping and photomontage visualisations there is an accumulation of wind energy development proposed in this area of East Clare, particularly in the Slieve Bernagh Uplands, which is an area of the landscape (LCA-8) where wind energy is strategically directed in local planning policy – the CWES. The cumulative photomontages in the Volume 2 Booklet illustrate the nature and extent of potential cumulative visual effects which are likely to occur on specific visual receptors and the differing geographic perspectives surrounding the site. This LVIA has determined that the undulating and well-defined landform features and valleys in this area have the potential to reduce the extent of cumulative visual effects experienced by visual receptors in this area that this landscape has the capacity to absorb the Proposed Development and will not have significant cumulative or in-combination effects with the other potential wind energy developments.

14.7.4 Turbine Range: Assessment of Landscape and Visual Effects

Section 14.1.2.3 describes the range of turbine dimensions assessed in this Chapter. The model defined as 'Maximum Tip Height, Maximum Hub Height, Minimum Rotor Diameter', with a tip height of 185m, a rotor diameter of 149m and a hub height of 110.5m is considered throughout this Chapter as the best representative illustration of the Proposed Development (For reasons outlines in Section 14.1.2.3 previously). This combination of rotor diameter and hub height (Maximum Tip Height, Maximum Hub Height, Minimum Rotor Diameter) is the turbine presented for every photomontage viewpoint in the photomontage booklet (and all photowires in Appendix 14-5).

Two other alternative turbine model configurations have been presented for 4 selected viewpoints included at the end of the photomontage booklet – VP13, VP14, VP25, and VP16. For each viewpoint (VP13, VP14, VP15 and VP16), the proposed turbines are modelled using two other turbine envelope

configurations comprising slightly different sized components within the range than the specifications modelled for all other visualisations presented in the rest of the photomontage booklet (and photowires in Appendix 14-5), these other alternative models include:

- Red Wireline – 'Maximum Tip Height, Intermediate Hub Height, Maximum Rotor Diameter Maximum': Presented for VP13, 14 15 and 16 in the photomontage booklet:
  - Maximum Tip Height – 185 metres;
  - Intermediate Hub Height – 103.5 metres;
  - Maximum Rotor Diameter – 163 metres.
- Brown/Yellow Wireline - 'Minimum Tip Height, Minimum Hub Height, Intermediate Rotor Diameter': Presented for VP13, 14 15 and 16 in the photomontage booklet:
  - Minimum Tip Height – 179.5 metres;
  - Minimum Hub Height – 102.5 metres;
  - Intermediate Rotor Diameter – 154 metres.

Two of the selected viewpoints are located in very close proximity to the proposed turbines where visual difference arising from the turbine range is most likely to be perceptible - VP13 (800m) and VP16 (2.2km). VP14 (7.4km) and VP15 (4.4km) are slightly more distant in order to show a range of views. The photomontage visuals show that there is barely a discernible difference between the different ranges. The difference is only evident with the aid of a comparative wireline. Comparative wireline views are provided in order to provide a visual aid for the reader and assessor to truly understand the visual difference between the differing turbine models presented as part of the range. The comparative wireline is presented at 53.5° after each photomontage and shows the wireline of the alternative turbine envelope overlain the model used for all other viewpoints.

The photomontage impact assessment tables in Appendix 14-3 include an additional row for Viewpoints VP13, VP14, VP15 and VP16 – '*Turbine Range Assessment*'. This row includes an analysis of the photomontages and the difference in the visual effects due to the different turbine models used. For all viewpoints, the visual difference can only really be fully understood with the aid of the comparative wireline. The difference arising from the range is most evident from VP13 and VP16 which are located in close proximity to the proposed turbines. Visual difference arising between the range is barely discernible from more distant views (VP14 and VP15) even with the use of the comparative wireline. For all viewpoints the difference in magnitude of change arising from the use of different turbine models is negligible and irrespective of which model in the range is used, the determination of likely significant residual visual effects will not be altered for any of the four viewpoints.

As demonstrated by the turbine ranges presented in the *Photomontage Booklet*, irrespective of which combination of tip height, hub height and rotor diameter within the proposed range outlined in this application is installed on site, the significance of residual landscape and visual effects will not be altered.

14.7.5 Decommissioning Phase Effects

The landscape and visual effects during decommissioning are anticipated to be of a similar nature as those occurring during the construction phase.

The important element of decommissioning from an LVIA perspective is the dismantling and removal of the wind turbines. This will occur for a limited period of time and will predominately involve cranes adjacent to the turbines during the dismantling process. Upon decommissioning of the Wind Farm Site, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbine will likely be removed from the Wind Farm Site using the same transport methodology adopted for delivery to the Site initially.

Removal of the turbines and ancillary infrastructure from the Wind Farm Site during the decommissioning phase will result in a **'Short-Term', 'Slight', 'Negative'** visual effect. A Decommissioning Plan has been prepared (Appendix 4-6), the details of which will be agreed upon with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed upon with the competent authority at that time.

14.8 Conclusion

This chapter of the EIAR is a Landscape and Visual Impact Assessment (LVIA) of the Proposed Development. The assessments in this chapter focussed on the impact of the proposed turbines as the essential aspect of the Proposed Development likely to give rise to significant landscape and visual effects. A study area was set to 20km from the proposed turbines termed as the 'LVIA Study Area'. The LVIA was conducted in accordance with national and international LVIA guidance through desktop analysis, on-site appraisals, topographical and ZTV modelling and production of photomontages. This chapter includes a description of the landscape and visual baseline conditions of the Wind Farm Site and LVIA Study Area. The baseline exercises outline the local policy context with respect to landscape and visual designations, calculates the ZTV to identify the landscape areas and visual receptors needing assessment and evaluates the cumulative context of landscape and visual effects in combination with other existing, proposed and permitted wind farm developments in the LVIA Study Area.

This chapter is accompanied by one volume and five appendices as follows:

- Volume 2: *Photomontage Booklet*, presenting existing and cumulative visualisations of the proposed Knockshanvo turbines from 16 No. representative viewpoints in the LVIA Study Area;
- Appendix 14-1: *LVIA Methodology*, outlining the detailed methodology and guidance used for the assessments reported in Chapter 14;
- Appendix 14-2: *LCA Assessment Tables*, assessing effects on designated Landscape Character Areas (LCAs);
- Appendix 14-3: *Photomontage Viewpoint Assessment Tables*, a visual impact assessment of the 16 No. representative viewpoints presented in the *Photomontage Booklet,* including assessment of cumulative effects;
- Appendix 14-4: *LVIA Baseline Map*, a large A0 map showing all baseline landscape features, visual receptors, ZTV and viewpoints;
- Appendix 14-5: *Photowire Booklet*, presenting draft photomontage visualisations from 28 No. viewpoint locations in the LVIA Study Area which were not selected for the final Photomontage Booklet

The Wind Farm Site is located in the Slieve Bernagh Uplands LCA of Co. Clare, which is situated on commercial forestry lands of 'Low' sensitivity which has been highly altered by human activity, with 8 of the 9 No. turbines sited within a 'Strategic Area' for wind development as designated by the county development plan and the remaining 1 No. turbine sited within an area designated as 'Acceptable in Principle'. The siting and design of the Proposed Development are found to comply with development guidelines for wind energy in terms of its location on ridgelines and 4-times-tip-height set-back distance, spatial extent, spacing and layout of turbine clusters within undulating mountain topography, height and scale within the landscape and capacity to absorb cumulative wind energy developments.

Imagery was captured from a total of 44 No. viewpoints in the LVIA Study Area for the production of photomontages and photowire visualisations. These visualisations were used to assess the landscape and visual effects of the proposed turbines on all of the receptors scoped in for assessment during preliminary analysis using ZTV mapping. The visual receptors include: 7 No. designated Scenic Routes and Views, 1 No. OSi Viewing Area, 18 No. settlements, 7 No. recreational routes (i.e. walking trails), 2 No. cultural heritage destinations and 9 No. regional- and national-level transport routes. Many

receptors are represented within the 16 No. selected photomontage viewpoints (Photomontage booklet), and many are represented by the 28 No. supplementary photowire viewpoints (Appendix 14-5).

Eight No. designated LCAs were identified within the LCA Study Area (area within 15km form the proposed turbines for assessment of effects on designated LCAs) and were scoped in for assessment following a preliminary analysis. The comprehensive assessment of each LCA is reported in Appendix 14-2. Six were assessed from Co. Clare and one each from Counties Tipperary and Limerick. Of these, 1 No. LCA was found to be of 'High' sensitivity: C LCA-13 'Ennis Drumlin Farmland' due to its proximity to the County Hub town of Ennis. The LCA in which the Wind Farm Site is located is C LCA-8 'Slieve Bernagh Uplands', which was found to have 'Low' sensitivity. For all LCAs, the effects were found to have a significance rating of 'Slight', owing to mitigating factors including: (i) increased distance from the Site (i.e. the turbines being viewed from relatively far away), (ii) design mitigation such as appropriate set-back distance from receptors and siting within the 'Strategic Area' landscape designation and (iii) localised screening by topography, vegetation and/or built structures.

Sixteen No. viewpoints were selected and comprehensively assessed for visual effects, of which 9 No. viewpoints were located within 5km of the Proposed Development Site. Of the viewpoints assessed, 14 No. had residual effects rating either 'Not Significant', 'Slight' or 'Moderate' according to the EPA (2022), and 2 No. viewpoints had residual effects rating as 'Significant'; these are discussed below.

The first viewpoint found to have 'Significant' residual visual effects was VP12 representing the 12 O'Clock Hills Waymarked Walking Trail (including the Looped Walks) in the townland of Snaty (Wilson) within the Wind Farm Site itself. This rating was primarily attributed to the position of turbines T1, T2 and T3 of the Western Cluster being situated in very close proximity to the Blue, Purple and Red Loops of the 12 O'Clock Hills walking route and the viewing area along the ridgetop of Knockanuarha. To offset effects upon the recreational amenity of this walking route, proposed works for one new section of walking trail and two new viewing areas, along with upgrades to a third viewing area, are incorporated as part of this EIAR. The new viewing areas are locations permitting long ranging and uninterrupted (by turbines) landscape views of a high scenic quality in multiple directions which are not significantly impacted by the Proposed Development or other wind energy projects (existing, permitted or proposed).

The second viewpoint found to have 'Significant' residual visual effects was VP13 representing views from the L3042 local road in the townland of Drumsillagh or Sallybank (Parker) approx. 800m west of the nearest proposed turbine. This rating was attributed to the existence of two residential receptors adjacent to the Wind Farm Site and viewpoint which are deemed to have a 'Substantial' magnitude of change; however, the horizontal extent of the affected views is not large and other factors such as adherence to set-back distance according to wind energy development guidance and the sense of scale of the development within the landscape are found to be appropriate.

The analysis of cumulative effects identified several possibilities of potential effects arising in different cumulative scenarios (existing, permitted and proposed) with 7 No. other existing, permitted and proposed wind energy developments identified within the LVIA Study Area. Assessment of cumulative effects are factored into the impact assessment of effects on specific receptors in Chapter 14. The greatest potential for cumulative effects arises with the proposed Oatfield Wind Farm (11 No. turbines), situated in very close proximity to the Proposed Development, in fact comprising two turbine clusters situated north and south of the Site: 4 No. turbines sited immediately north of the Central Cluster at the foot of Knockshanvo mountain and 7 No. turbines immediately south of the Western Cluster on the flanks of Knockanuarna mountain. Assessment of cumulative visual effects of the proposed Knockshanvo turbines and Outfield turbines are comprehensively discussed in the viewpoint assessments in Appendix 14-3 and are summarised in Chapter 14.

Three No. developments, the permitted Carrownagowan (18 No. turbines), permitted Fahy Beg (8 No. turbines) and proposed Lackareagh (7 No. turbines) and Wind Farms, are located to the east within the same Slieve Bernagh Uplands LCA of Co. Clare, constituting potential moderately distant views (within 5km) of turbines in combination with the Proposed Development when looking across Glenomra

Valley from the elevated vantage point of the 12 O'Clock Hills. A fourth development, the proposed Ballycar (12 No. turbines) Wind Farm, is located on Woodcock Hill, to the south of the Wind Farm Site, and can be expected to constitute combined views of turbines, but only from the south. Two No. existing single-turbine wind farms, Vistakon and Knockballynameath, are located closer to Limerick City and rarely seen in combination with the Proposed Development.

The LVIA addresses all potential cumulative interactions through the use of photomontage visualisations and written descriptions. The LVIA emphasises that the probability of cumulative effects with other proposed developments is reliant upon the consenting process and a number of other post consent factors which will influence whether the project is constructed.

The final proposed turbine layout of the Proposed Development was informed by an extensive iterative design process. The design of the wind farm was informed by a landscape capacity assessment using ZTV modelling and photomontages of multiple turbine layouts. Through this process, the proposed turbine layout was ultimately halved from 18 No. turbines to 9 No. turbines, with potential significant effects on landscape and visual amenity and potential for cumulative effects a key consideration in the final design of the Proposed Development. In this regard, the impact assessments in this Chapter have determined that the Proposed Development is an appropriately designed wind farm although some significant visual impacts occur from a small number of local residential receptors, these effects have been mitigated where possible through use of appropriate set back distances (e.g. 750m set back from residential dwellings – greater than 4x tip height). The significant impacts on locally valuable recreational trails and views on the 12 O clock Hills have been offset through the provision of new recreational amenities. The assessments in this chapter have determined that the scale of the proposed turbines are suitable for their locational siting in an undulating upland landscape which is capable of effectively accommodating the Proposed Development; an upland landscape which is also designated as a Strategic Area for wind energy development in local planning policy.