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14 LANDSCAPE & VISUAL

14.1 Introduction

This chapter describes the landscape context of the Proposed Development and assesses the likely landscape and visual impacts of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment (LIA) relates to changes in the physical landscape brought about by the proposed development, which may alter its character, and how this is experienced. This requires a detailed analysis of the individual elements and characteristics of a landscape that go together to make up the overall landscape character of that area. By understanding the aspects that contribute to landscape character, it is possible to make judgements in relation to its quality (integrity) and to identify key sensitivities. This, in turn, provides a measure of the ability of the landscape in question to accommodate the type and scale of change associated with the proposed development without causing unacceptable adverse changes to its character.

Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or; Visual Intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.

The LVIA uses methodology as prescribed in the following guidance documents:

- European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU);
- Environmental Protection Agency (EPA) publication '*Guidelines on the Information to be contained in Environmental Impact Statements (2022)*
- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled *Guidelines for Landscape and Visual Impact Assessment – Third Addition (2013)*.
- NatureScot (2021) Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments. [online]
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006 and 2019 draft).

- NatureScot Visual representation of wind farms: Best Practice Guidelines (version 2.2 - 2017).

14.2 Statement of Authority

This Landscape and Visual Assessment (LVIA) chapter was prepared by Cian Doughan, Bachelor of Science in Landscape Architecture and Corporate Member of the Irish Landscape Institute (MILI) with seven years of experience. The chapter was reviewed by Richard Barker (Masters in Landscape Architecture and MILI) of Macro Works Ltd, who has 18 years of experience in the appraisal of effects from a variety of energy, infrastructure and commercial developments.

14.3 Consultations

No specific consultee responses were received in relation to Landscape and Visual.

14.4 Methodology

This document uses methodology as prescribed in the previously mentioned Guidelines on Landscape and Visual Impact Assessment (GLVIA3), which follows the European Landscape Convention (ELC) definition of landscape:

‘Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’ (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from “high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)” - whether protected or degraded.

Another useful document that has also been utilised for this assessment is the more recent ‘Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3) – Consultation’, which is currently in draft format, with the final document due to be published imminently.

14.4.1 Baseline surveys / Data Gathering

Production of this Landscape and Visual Impact Assessment involved baseline work in the form of desktop studies and fieldwork comprising professional evaluation by qualified and experienced Landscape Architects. This entailed the following:

14.4.1.1 Zone of Influence or Study Area

Both the 2006 Wind Energy Development Guidelines and draft revised 2019 Wind Energy Development Guidelines published by the Department of the Environment, Heritage and Local Government specify radii for examining the zone of theoretical visibility of proposed wind farm projects (ZTV). The extent of this search area is influenced by turbine height, as follows (the guidance in the 2006 and draft revised 2019 guidance is identical in relation to defining the radii for examining the zone of theoretical visibility of proposed wind farm projects):

- 15 km radius for blade tips up to 100m;

- 20 km radius for blade tips greater than 100m and;
- 25 km radius where landscape features of national and international importance exist.

In the case of the Proposed Development, the blade tips are up to 180m high and, thus, the minimum ZTV radius recommended is 20 km (refer to **Figure 14.1** below) from the outermost turbines of the scheme. There are not considered to be any sites of national or international importance between 20 – 25km and thus, the radius of the study area will remain at 20km. Notwithstanding the full 20km extent of the LVIA study area, there will be a particular focus on receptors and effects within the central study where there is higher potential for significant impacts to occur. When referenced within this assessment, the ‘central study area’ is the landscape within 5km of the site.

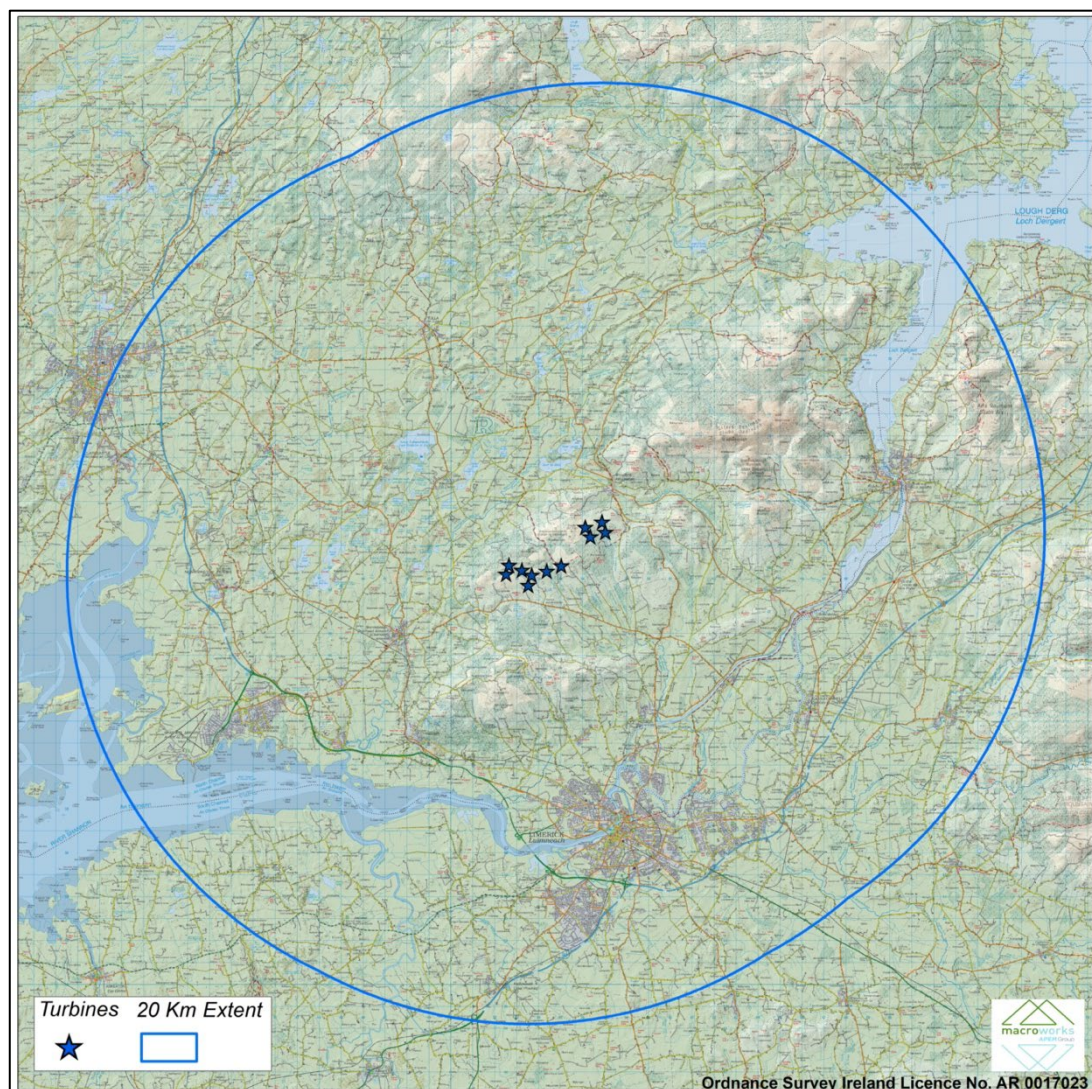


Figure 14.1 Full 20km extent of the study area

14.4.1.2 Desktop study

- Establishing an appropriate Study Area from which to study the landscape and visual impacts of the proposed wind farm;

- Review of a Zone of Theoretical Visibility (ZTV) map, which indicates areas from which the development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape, scenic view/route designations and relevant landscape character assessments;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity;

14.4.1.3 Fieldwork

- Recording of a description of the landscape elements and characteristics within the Study Area.
- Selection of a refined set of VRP's for assessment. This includes the capture of reference images and grid reference coordinates for each VRP location for the visualisation specialist to prepare photomontages.

14.4.1.4 Appraisal

- Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the study area including landform, drainage, vegetation, land use and landscape designations.
- Consideration of the visual environment including receptor locations such as centres of population and houses; transport routes; public amenities and facilities and; designated and recognised views of scenic value.
- Consideration of design guidance and planning policies.
- Consideration of potentially significant effects and the mitigation measures that could be employed to reduce such effects.
- Estimation of the significance of residual landscape effects.
- Estimation of the significance of residual visual effects aided by photomontages prepared at all of the selected VRP locations.
- Estimation of cumulative landscape and visual effects in combination with other surrounding developments that are either existing or permitted.

14.4.2 Assessment Methodology

14.4.2.1 Assessment Criteria for Landscape Impact

The classification system used by Macro Works to determine the significance of landscape and visual impacts is based on the IEMA Guidelines for Landscape and Visual Impact Assessment (2013). When assessing the potential impacts on the landscape resulting from a wind farm development, the following criteria are considered:

- Landscape character, value and sensitivity
- Magnitude of likely impacts; and

- Significance of landscape effects

Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in **Table 14.1** below.

Table 14.1 Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

Magnitude of Change - Landscape Impact

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape

components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. **Table 14.2** outlines criteria used to inform this judgement.

Table 14.2 Magnitude of Landscape Effects

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an extensive change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to a considerable change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to noticeable changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements that would lead to discernible changes in landscape character, and quality
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable leading to no material change to landscape character, and quality.

14.4.2.2 Assessment Criteria for Visual Impact

This part of the LVIA provides an assessment of how the introduction of the proposed development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the proposed development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and;
- The overall impact on visual amenity.

It has been deemed appropriate to structure the assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the proposed development. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. Criteria outlined below are used to guide these judgements.

Sensitivity of Visual Receptors

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

Susceptibility of Visual Receptors to Change

In accordance with GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- “Residents at home;
- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area;
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened”.
- Visual receptors that are less susceptible to changes in views and visual amenity include;
- “People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;
- People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life”.

Value Associated with the View

- Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Development Plans, for example, a public consultation process is required;
- Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;
- Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;
- Viewer connection with the landscape. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy roads versus tourists focussed on the character and detail of the landscape;
- Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
- Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
- Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
- Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;
- Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
- Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;

- Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;
- Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

Magnitude of Change – Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of the proposed development. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature, and essentially relate to how noticeable or 'dominant' the proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop, and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant.

For wind energy developments, a strong visual presence is not necessarily synonymous with adverse impact. Instead, the 2012 Fáilte Ireland survey entitled 'Visitor Attitudes On The Environment – Wind Farms' found that *"Compared with other types of development in the Irish landscape, wind farms elicited a positive response when compared to telecommunication masts and steel electricity pylons"....* and that *"most (tourists) felt that their presence did not detract from the quality of their sightseeing, with the largest proportion (45%) saying that the presence of the wind farm had a positive impact on their enjoyment of sightseeing..."*. The purpose here is not to suggest that turbines are either inherently liked or disliked, but rather to highlight that the assessment of visual impact magnitude for wind turbines is more complex than just the degree to which turbines occupy a view. Furthermore, a clear and comprehensive view of a wind farm might be preferable in many instances to a partial, cluttered view of turbine components that are not so noticeable within a view. On the basis of these reasons, the visual amenity aspect of assessing impact magnitude is qualitative and considers such factors as the spatial arrangement of turbines both within the scheme and in relation to surrounding terrain and land cover. It also examines whether the project contributes positively to the existing qualities of the vista or results in distracting visual effects and disharmony.

It should be noted that as a result of this two-sided analysis, a high order visual presence can be moderated by a low level of effect on visual amenity and vice versa. Given that wind turbines do not represent significant bulk, visual impacts result almost entirely from visual 'intrusion' rather than visual 'obstruction' (the blocking of a view). The magnitude of visual impacts is classified in the following **Table 14.3** below.

Table 14.3 Magnitude of Visual Effect

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

14.4.2.3 Significance of Effect

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change, and is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is arrived at using the Significance Matrix at **Table 14.4** as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape institute, 10th June 2013)).

Indicative criteria descriptions used in relation to the significance of effect category are presented at **Table 14.5** below.

Table 14.4 Significance Matrix

	<i>Sensitivity of Receptor</i>				
<i>Magnitude</i>	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: Judgements deemed ‘substantial (yellow colour)’ and above are considered to be ‘significant impacts’ in EIA terms.

Table 14.5 Indicative significance of effect criteria descriptions

	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall

	minor changes over some of the area or moderate changes in a localised area.	visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

It is important that the likely effects of the proposals are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms, and may be regarded as 'Significant', albeit it is important to note that this is not a reflection on their acceptability in planning terms.

14.4.2.4 Quality of Effects

In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape.

In the case of new energy / infrastructure developments within rural and semi-rural settings, the landscape and visual change brought about by an increased scale and intensity of built form is seldom considered to be positive / beneficial. Effects in these contexts are generally considered to be adverse in nature, or neutral, where the effect has little influence on the landscape/views.

14.5 Receiving Environment

14.5.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposal will be assessed. This also includes reference to any relevant landscape character appraisals and the current landscape policy context (both are generally contained within County Development Plans).

A description of the landscape context of the proposed wind farm site and wider study area is provided below under the headings of landform and drainage and vegetation and land use. Centres of population, transport routes and tourism, recreation and heritage features form part of the visual baseline and are dealt with in Section 14.5.2.

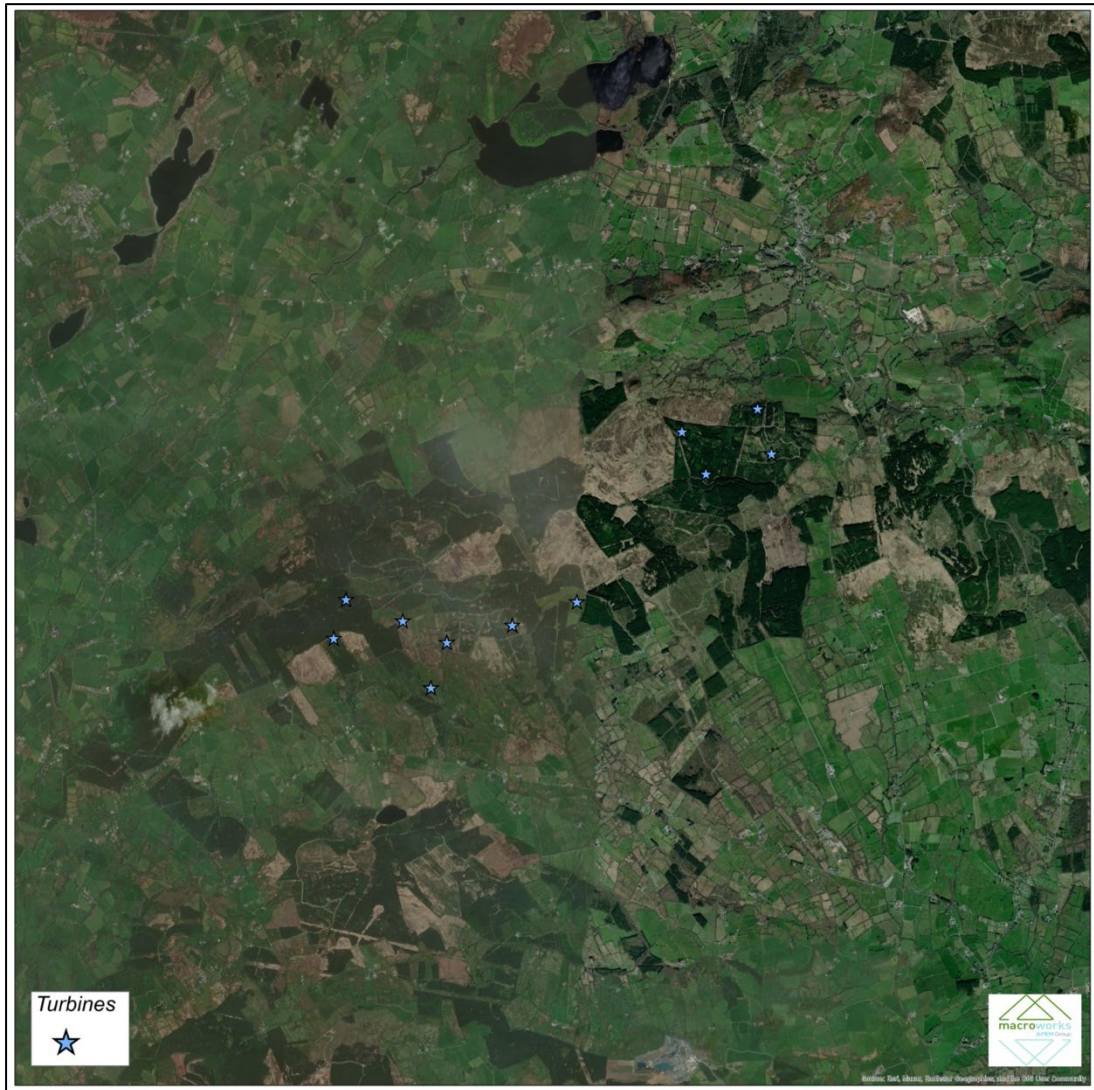


Figure 14.2 Aerial Photograph showing the landscape context of the site and its immediate surrounds

14.5.1.1 Landform and Drainage

The Proposed Development is located within an area of rolling hills and ridges known as the Broadford Hills that rise to the west of the Slieve Bearnagh Uplands and north of Limerick City and the River Shannon (refer to **Figure 14.2** above). The Proposed Development is situated across a rolling ridge oriented in a general northeast-by-southwest direction that rises to a max elevation of c. 309m at the summit of Knockanuarha. Within the central study area, a cluster of rolling hills and ridges also rises to the south of the site to a similar max elevation of c. 310m AOD at Woodcock Hill. The foothills of the Slieve Bearnagh Mountains also rise throughout the eastern half of the central study area. Other notable landscape features within the central study area include Doon Lough, which is situated just over c. 3.5km north of the nearest turbine and is fed by the Broadford River, which flows in a general westerly direction through the central study area before curving southwest in the western half of the central study area. Several other small loughs occur throughout the northwest part of the central study area, whilst

several streams flow south and southeast from the Broadford Hills in the southern half of the central study area.

The principal landscape features in the wider study area include the Slieve Bearnagh Uplands and the River Shannon corridor. The Slieve Bearnagh Mountains begin to rise in the eastern periphery of the central study area and are predominately contained throughout the wider eastern and northern extents of the study area. Whilst several elevated ridges and mountaintop summits rise within the Slieve Bearnagh Mountains, the most elevated of these is Moylussa, which rises to a maximum elevation of 531m AOD. The River Shannon is the principal watercourse within the study area and wraps around its wider eastern, southern and western extents. The River Shannon and its wider environs enter the study area to the north in the form of Lough Derg and meanders through the eastern, southern and western extents of the study area. The wider northern extents of the study area also encompasses parts of the Slieve Aughty Mountains, whilst numerous small loughs and watercourses punctuate the landscape in the wider north and western extents of the study area.

14.5.1.2 Vegetation and Land Use

Due to the varied mix of landforms within the study area, there is a similarly varied mix of land uses. Much of the land use within the site and its immediate surrounds is contained in more typical transitional land uses such as areas of forestry, fields contained in scrub and some local areas of moorland and peat bog. As the terrain descends from the more elevated lands, pastoral farmland bound by mixed hedgerow vegetation becomes the predominant land use. Some notable areas of riparian woodland occur in the immediate surrounds of the numerous lakes and watercourses within the study area. The central study area also comprises some quarrying facilities, whilst the settlements of Broadford and Kilkishen account for the most notable areas of urban land uses.

Whilst the predominant land use in the wider study area is pastoral farmland, there is a notable accumulation of commercial conifer forest plantations in the most elevated surrounding lands, such as the Slieve Bearnagh Uplands and the Slieve Aughty Mountains (refer to **Figure 14.3** below). These elevated lands also encompass broad areas of moorland, whilst small areas of transitional scrub are located along the more transitional areas. Extensive areas of mudflats and estuarine land uses are also situated throughout the southwest quadrant of the wider study area in the surrounds of the River Shannon Estuary, whilst notable swathes of riparian woodland bind the River Shannon corridor and Lough Derg in the southern and eastern extents of the wider study area. The wider study area also comprises large areas of urban land use such as Limerick City, Shannon town and International Airport and the wider surrounds of the settlement of Ennis. Other notable linear land uses include the M7, M18 and M20 motorways, the N18 national primary route and several national secondary route corridors.

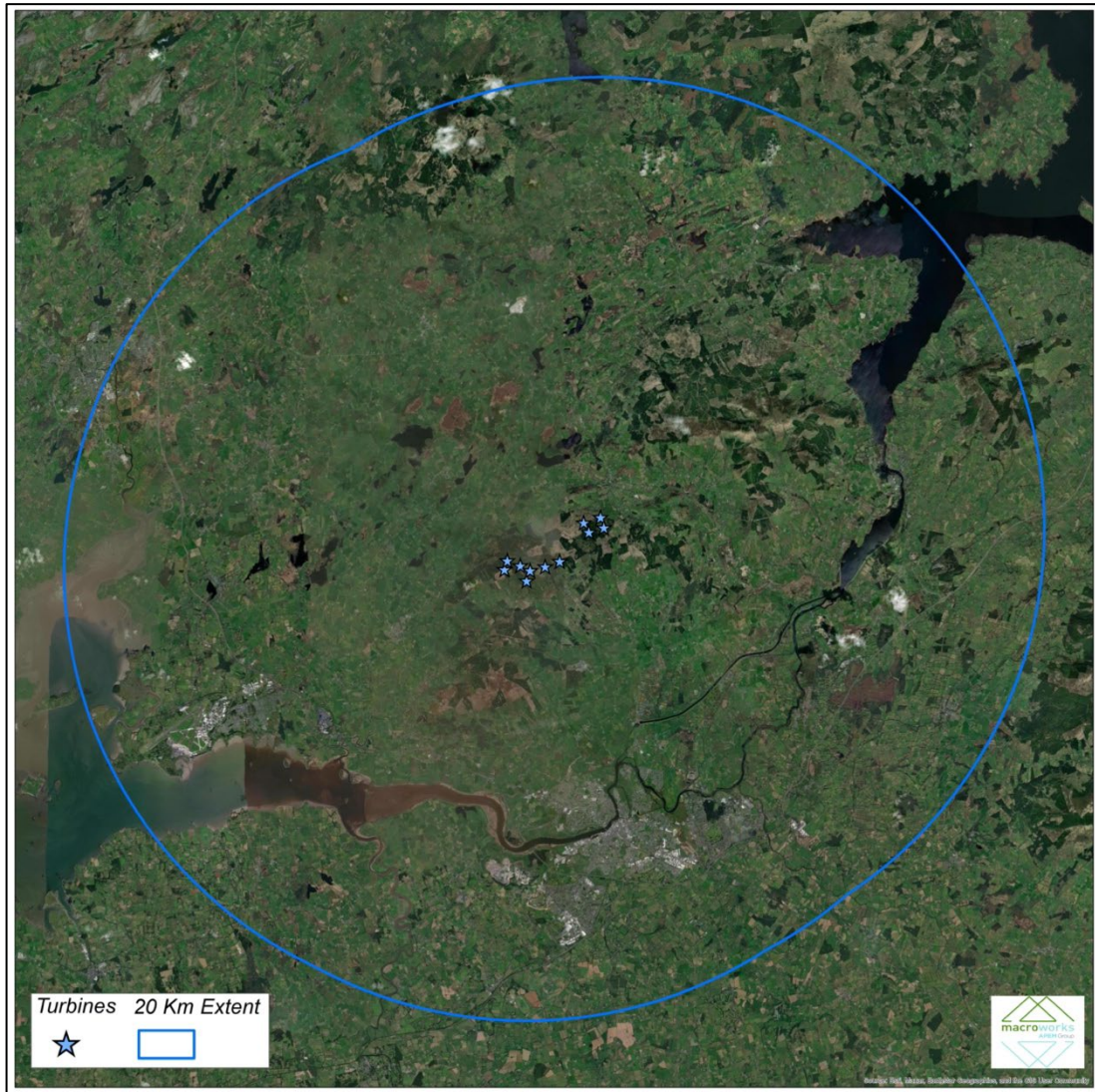


Figure 14.3 Aerial photograph showing the landscape context of the wider study area.

14.5.2 Landscape Policy Context and Designations

14.5.2.1 *The Department of Environment, Heritage and Local Government Wind Energy Development Guidelines 2006 and draft revised 2019 Wind Energy Development Guidelines*

The Wind Energy Development Guidelines (2006/2019 Draft revision) provide guidance on wind farm siting and design criteria for a number of different landscape types. Whilst the site of the Proposed Development is located along elevated lands in the surrounds of Knockanuarha Mountain, the land uses represent a more transitional landscape type as opposed to more typical uplands. Thus, it is considered that the ‘Transitional Marginal Landscape’ type in the Wind Energy Development Guidelines is the most consistent with the landscape context of the Proposed Development and its local surrounds. Nevertheless, some parts of the central study area also encompass characteristics from the ‘Mountain Moorland’ landscape type in addition to some upland parts of the wider northern half of the study area, whilst the low rolling lands that occupy large parts of the

central study and wider study area are most consistent with the 'Hilly and Flat Farmland' landscape type. Siting and design recommendations for the 'Transitional Marginal' landscape type are included below:

Transitional Marginal Landscapes:

Location – *“As wind energy developments, for reasons of commercial viability, will typically be located on ridges and peaks, a clear visual separation will be achieved from the complexity of lower ground.”*

Spatial extent – *“Wind energy developments in these landscapes should be relatively small in terms of spatial extent. It is important that they do not dominate but achieve a balance with their surrounds, especially considering that small fields and houses are prevalent”*

Spacing - *“All options are possible, depending on the actual landscape characteristics. However, irregular spacing is likely to be most appropriate.”*

Layout - *“The likely location of wind energy developments on ridges suggests a linear or staggered linear layout whereas on broader hilltops they could be linear or clustered”*

Height - *“...where the upper ground is relatively open and visually extensive, taller turbines may be more appropriate”*

Cumulative - *“This would have to be evaluated on a case-by-case basis, but great caution should be exercised. The spatial enclosure often found in transitional marginal landscapes is likely to preclude the possibility of seeing another wind energy development. However, should two or more wind energy developments be visible within a confined setting a critically adverse effect might result, depending on turbine height and wind energy development extent and proximity.”*

It is considered that the proposed wind farm developments siting and design responds well and is consistent with the guidance notes for the 'Transitional Marginal Landscapes' landscape type. In terms of the locational guidance, the Proposed Development design responds well, as the proposed turbines are principally located along some of the most elevated hills and ridges within central study area and are well offset from areas of lower ground. The irregular spacing of the Proposed Development also responds well to the spatial guidance, which states *“irregular spacing is likely to be most appropriate”*.

Siting in Relation to Individual Properties ('Setback')

Section 6.18 of the Draft Revised Wind Energy Development Guidelines (December 2019) refers to appropriate setback distances for visual amenity purposes. The guidelines outline a mandatory minimum setback distance of *“500 meters”* or the distance of *“4 times the tip height”* of the proposed turbines *“between the nearest point of the curtilage of any residential property”*. This is set out in the Specific Planning Policy Requirements 2 (SPPR2) which is included below:

SPPR 2: With the exception of applications where reduced setback requirements have been agreed with relevant owner(s) as outlined at 6.18.2 below, planning authorities and An Bord Pleanála (where relevant), shall, in undertaking their development planning and development management functions, ensure that a setback distance for visual amenity purposes of 4 times the tip height of the relevant wind turbine shall apply between each

wind turbine and the nearest point of the curtilage of any residential property in the vicinity of the proposed development, subject to a mandatory minimum setback of 500 metres from that residential property. Some discretion applies to planning authorities when agreeing separation distances for small scale wind energy developments generating energy primarily for onsite usage. The planning authority or An Bord Pleanála (where relevant), shall not apply a setback distance that exceeds these requirements for visual amenity purposes.

The nearest residential dwelling to any of the proposed turbines is approximately 725m which exceeds and fully complies with the setback distance outlined in both the current 2006 Guidelines and the Draft Revised Guidelines (2019), which in this instance is 720m. One dilapidated property is located within the 720m setback distance. However, the property owners are involved in the Proposed Development and have agreed to and accepted the siting of the wind turbines. In accordance with Section 6.18.2 of the *Draft Revised Wind Energy Development Guidelines 2019*, written confirmation of the residents' acceptance of this reduced separation distance has been submitted in accompaniment of the planning application.

14.5.2.2 Clare County Development Plan 2023-2029 – Chapter 14 Landscape

The current Clare County Development Plan (CDP) contains a Landscape Character Assessment that divides the county into 26 different Landscape Character Types (LCTs), which are then used as the basis to determine 21 geographically distinct Landscape Character Areas (LCAs). For most counties there are much fewer generic LCTs than LCAs. The fact that this trend is reversed for County Clare is more an indication of the diverse range of its landscapes than a divergent approach to landscape character assessment.

In terms of landscape character types, the current CDP states that the county landscape character types “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.” The site itself is situated across the ‘Upland Hills’ LCT, whilst the surrounding local landscape also comprises the LCTs ‘Upland Fringe’, ‘Glaciated Valley’, ‘River Valley Farmland’ and ‘Drumlin Farmland and Islands’ (refer to **Figure 14.4** below).

Landscape Character Areas (LCAs) are described in the current CDP as “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 site is located ‘LCA 8-Slieve Bernagh Uplands’. Other LCAs within the central study area include ‘LCA 10-Sixmilebridge Farmland’ and ‘LCA 11-East Clare Loughlands’ (**Figure 14.5** refers).

Whilst the County Landscape Character Assessment provides an objective appraisal of the various landscapes of County Clare, it does not apply the more subjective aspect of landscape sensitivity. Instead, landscape policy is driven by determining which of three categories a particular landscape falls into and these are based around the various LCAs. The landscape of County Clare is subdivided into Living Landscape types which are outlined below;

- *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.*

By implication, ‘Working Landscapes’ are more robust areas of strategic development whilst ‘Heritage Landscapes’ such as the Burren are highly sensitive. Permissive or protective landscape objectives are applied accordingly. The remainder, and majority of the county, falls into the settled landscapes category by default. The landscape related objectives for this category seek to strike a balance between appropriate development and retaining landscape character and amenity. In this instance, the southern extent of the Proposed Development is partially contained within a ‘working landscape’ associated with the areas surrounding the settlements of Ennis and the wider Limerick City environs known as the ‘The Western Corridor – Ennis to Limerick Working Landscape’, whilst the four turbines in the northern extent of the development are contained within the ‘settled landscapes’ category. Development plan objectives relating to working and settled landscapes are included in subsections 14.3.2.1 and 14.3.2.2 of the current CDP.

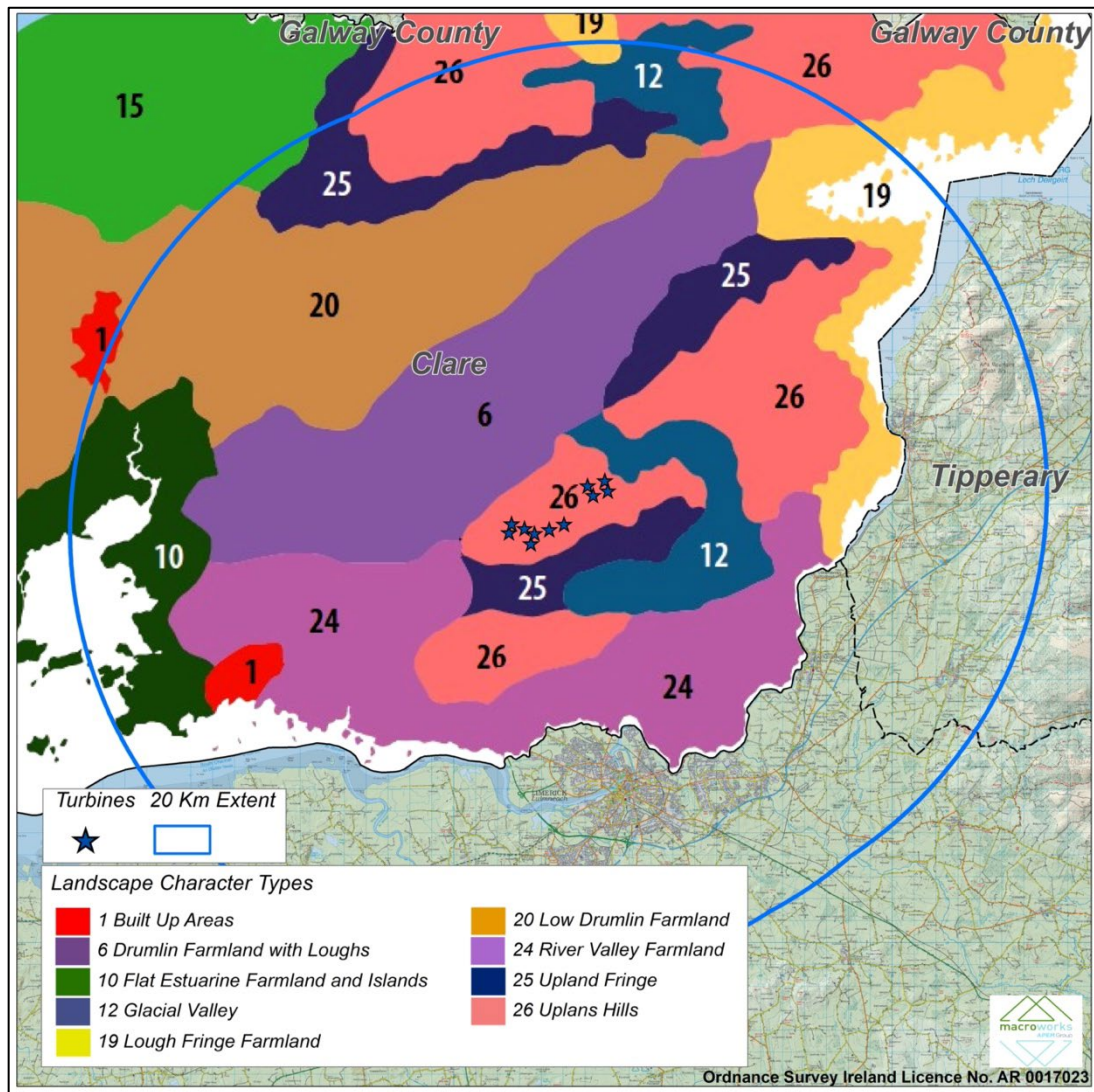


Figure 14.4 Excerpt from the current Clare CDP 2023-2029 showing landscape character types in relation to the proposed development

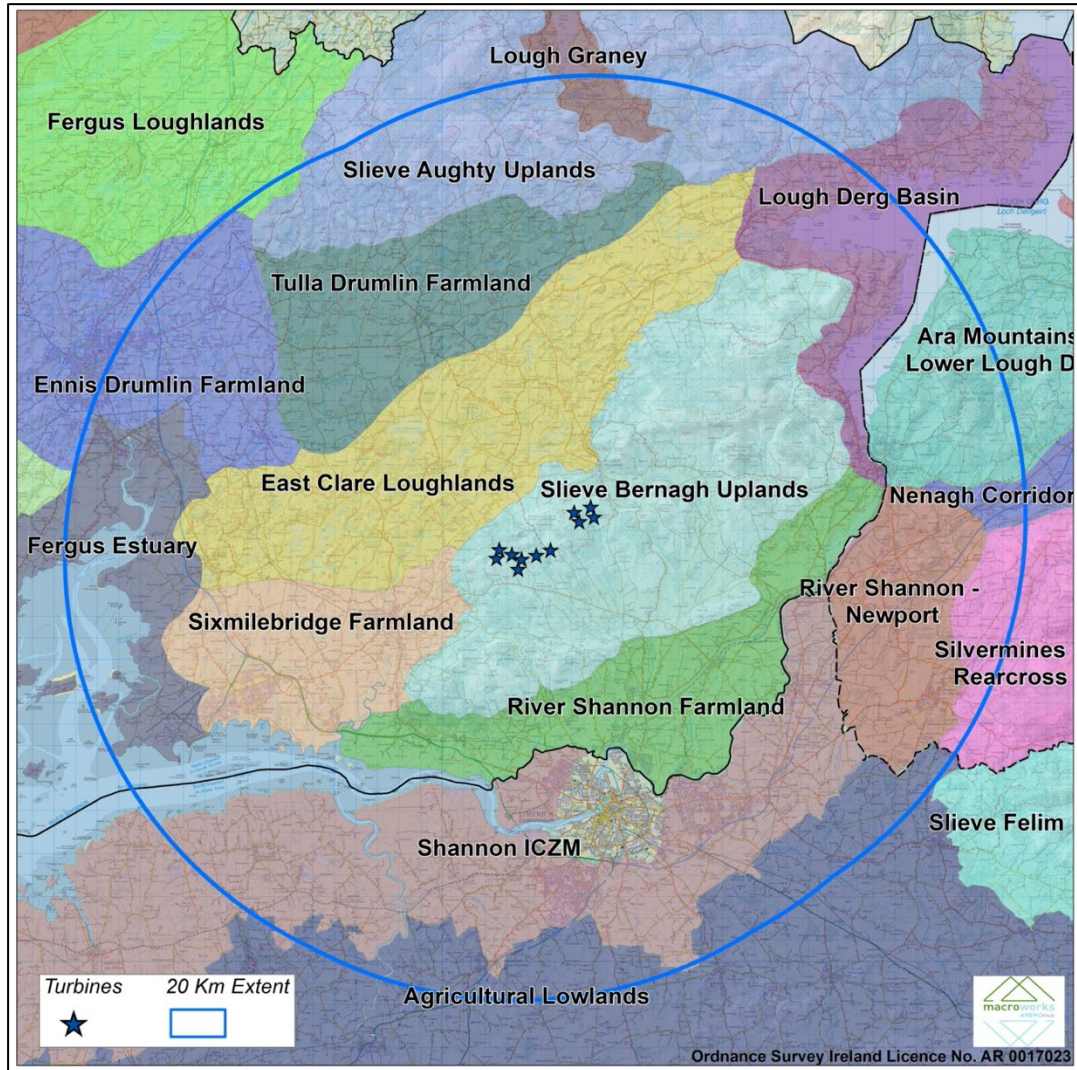


Figure 14.5 Excerpt from the current Clare, Limerick & Tipperary CDPs showing landscape character areas in relation to the Proposed Development

14.5.2.3 Clare County Development Plan 2023-2029 – Wind Energy Strategy

The current Clare County Development Plan (CDP) includes a Wind Energy Strategy in Volume 6. It is noted that the “Clare Wind Energy Strategy 2017-2023” has not been reviewed as part of the preparation of this plan. Figure D of the current Wind Energy Strategy identifies wind energy classifications across the county, which include ‘Strategic Areas’, ‘Acceptable in Principle’ area, ‘Open to Consideration’ areas and areas ‘Not Normally Permissible’. The Proposed Development is wholly contained within a ‘Strategic Area’. The current Wind Energy Strategy states “*these key areas are considered to be eminently suitable for wind farm development and are of strategic importance because of;*

- *Good/excellent wind resources*
- *Access to grid*

- *Distance from properties and*
- *Outside any Natura 2000 sites”*

Projects within these ‘strategic areas’ must:

- Demonstrate conformity with existing and approved wind farms to avoid visual clutter
- Be designed and developed in line with the Wind Energy Development Guidelines, Guidelines for Planning Authorities (DoEHLG, 2006) in terms of siting, layout and environmental studies.
- Provide a Habitats Directive Assessment under Article 6 of the Habitat Regulations if the site is located in close proximity to a Special Area of Conservation or Special Protection Area.
- Be developed in a comprehensive manner avoiding the piecemeal development of the areas designated as ‘strategic’.

The current Wind Energy Strategy also outlines the capacity of landscape character areas in relation to wind energy development. With regard to the Sliabh Bernagh Uplands LCA, which encompasses the site, the LCA has been classified with an overall ‘medium-low’ sensitivity to Wind Farm Developments and has the capacity to accommodate ‘large’ scale wind farm development. Nonetheless, the CDP states *“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”*. Notwithstanding, *“other areas on the northwest 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.”*

14.5.2.4 Limerick County Development Plan 2022-2028

Whilst the Proposed Development is wholly contained in County Clare, the southern extent of the wider study area encompasses areas within County Limerick. Thus, it is important to considered landscape related policy and designations in the current Limerick CDP.

Within the current Landscape Character Assessment for County Limerick, the nearest relevant rural LCA to the Proposed Development is ‘LCA 06 – Shannon Coastal Zone’, which comprises a large area of northern Limerick and is located immediately south of the Shannon Estuary within the study area (refer to **Figure 14.5** above). At its nearest point, this LCA is located some c.10km south and southeast of the proposed turbine array. Other LCAs in the urban area surrounding Limerick City identified on map 6.1 of the current CDP include ‘Castletroy’, ‘City’, ‘Caherdavin’ and ‘Southern Environs’. Specific Objectives relating to this landscape character areas are outlined in Table 6.1 of the current CDP.

14.5.2.5 Tipperary County Development Plan 2022-2028

Although the Proposed Development is entirely contained with County Clare, the wider eastern extent of the study area encompasses areas within County Tipperary. Thus, it is

important to considered landscape related policy and designations in the current Tipperary CDP.

Section 11.7 of the current CDP relates to landscape and 'Primary and Secondary Amenity Areas' which are *"particularly notable by virtue of their scenic and visual quality and offer significant opportunities for tourism development and rural recreational activities."* The nearest of these designations is a 'Primary Amenity Area', which is contained across a broad area of the landscape in the northeast quadrant of the study area in County Tipperary and is some c.13km from the proposed turbine array.

The current Tipperary County Development Plan includes a landscape character assessment for the County in Volume 3 of the CDP. This provides a hierarchy of landscape units beginning with high level 'Landscape Archetypes' then 'Landscape Character Types' and finally 23 geographically distinct 'Landscape Character Areas'.

The Landscape Character Assessment divides the county into four generic landscape archetypes; 'A – The Plains', 'B – The Lakelands', 'C – The Foothills' and 'D – The Uplands'. The nearest and most relevant of these archetypes is 'B-The Lakelands', which occurs along the banks of Lough Derg in the northeast quadrant of the study area. This area is described as *"working landscapes containing settlements that enclose and adjoin lake and river areas of national significance for tourism and recreation. This landscape also contains many historic sites"*.

In terms of 'Landscape Character Types (LCT)' and 'Landscape Character Areas (LCA)' the most relevant LCT is 'B2-Lakeland Enclosures', whilst the most relevant LCAs are 'LCA 12-River Shannon-Newport' and 'LCA 13-Arra Mountains-Lower Lough Derg' (refer to **Figure 14.5** above). Both of these LCAs have been designated with a dominant Class 4 – Transitional Vulnerability.

14.5.2.6 Ecological designations

Ecological designations such as Special Areas of Conservation (SAC's), Special Protection Areas (SPA's) Natural Heritage Areas (NHA's) and proposed Natural Heritage Areas (pNHA's) are relevant to the landscape and visual assessment as they can identify areas that are likely to exhibit naturalistic character and low levels of built development. They also highlight areas to which landscape conservation values are attached and they are often associated with outdoor amenity facilities where people go to enjoy the landscape setting.

In this instance there are 13 ecological designations within 10km of the site, which are included below. A 10km radius has been included in this instance as the proposed turbines will have a limited landscape effect on these ecological designations.

- Gortacullin Bog NHA (immediately west of the northern array)
- Doon Lough (c.2km north of the proposed turbine array)
- Danes Hole, Poulnaleca SAC (c. 2.2km north of the proposed turbine array)
- Woodcock Hill Bog NHA (c.3km south of the proposed turbine array)
- River Raty Cave SAC (c. 4.4km west of the proposed turbine array)
- Glenomre Wood SAC (c. 4.5km southeast of the proposed turbine array)

- Kilkishen House SAC (c. 5.1km northwest of the proposed turbine array)
- Cloonloun More Bog NHA (c.6.5km north of the proposed turbine array)
- Slieve Bernagh Bog SAC (c. 4.1km northeast of the proposed turbine array)
- Lower River Shannon (c.7.3km southeast of the proposed turbine array)
- Garrannon Wood pNHA (c.8.3km southwest of the proposed turbine array)
- River Shannon and River Fergus Estuaries SPA (c.9.0km south of the proposed turbine array)
- Loughanilloon Bog NHA (c. 10km north of the proposed turbine array)

14.5.3 Visual Baseline

Only those parts of the study area that potentially afford views of the Proposed Development are of interest to this part of the assessment. Therefore, the first part of the visual baseline is establishing a 'Zone of Theoretical Visibility' and subsequently, identifying important visual receptors from which to base the visual impact assessment.

14.5.3.1 Zone of Theoretic Visibility

A computer-generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate from where the Proposed Development is potentially visible (refer to **Figure 14.6** below). The ZTV below is based on a tip height of 180m.

The ZTV map is based solely on terrain data (bare ground visibility), and ignores features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the Proposed Development will definitely not be visible, due to terrain screening within the 20km study area.

A large-scale map of a ZTV showing the potential visibility up to the highest possible hub height of the proposed turbines is included in **Appendix 14.1**.

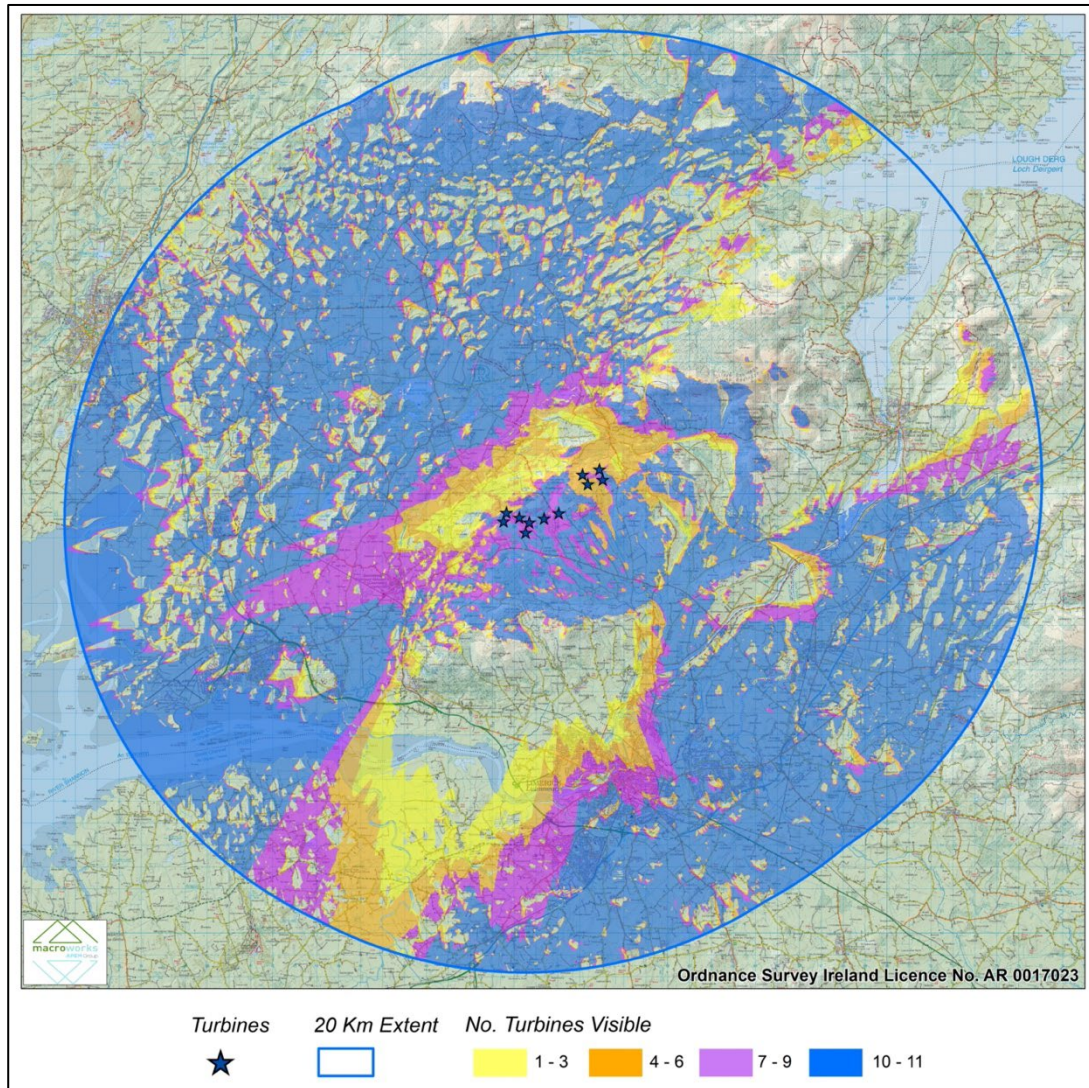


Figure 14.6 Bare-ground Zone of Theoretically Visibility (ZTV) Map based on a turbine tip height of 180m. (See Appendix 14.2 for larger scale map)

The following key points are illustrated by the 'bare-ground' ZTV map:

- Due to the location of the Proposed Development along elevated south-facing lands, much of the central study area to the south of the site has the potential to afford comprehensive views of the proposed wind farm development (blue colour pattern).
- Immediately north of the site, the potential for theoretical visibility is more sporadic as much of the sloping lands immediately north of the site will screen and partially screen the turbines from the landscape context to the immediate north of the site. Nonetheless, as the terrain begins to level out and rises further to the north, the potential for theoretical visibility increases.
- Immediately east of the site, the ZTV pattern is similarly sporadic, with a notable area of orange pattern (theoretical visibility of up to 6 turbines) located in the surround of the settlement of Broadford. This principally relates to the dispersed nature of the development, where many of the more western turbines will be

screened by the intervening terrain. Whilst there are some notable areas of comprehensive ZTV visibility along the elevated lands in the surrounds of Slieve Bearnagh, the potential for visibility is almost entirely eliminated further to the east and in the surrounds of Killaloe as a result of the Glenvagalliagh Mountain and its surrounding uplands.

- Broad areas of comprehensive ZTV pattern occur throughout the wider southern and south-eastern parts of the study area due to the terrain's relatively flat to low rolling nature. Nonetheless, beyond c. 4-5km directly south of the site, there will be a notable area of no turbine visibility as the elevated lands directly south of the site will screen the proposed turbines.
- Due to the locally rolling hills and ridges immediately west of the site, there will be some sporadic ZTV patterns within the central study area to the west of the site. Notwithstanding, as the terrain descends towards the more typical low rolling lowlands, a broad area of comprehensive ZTV pattern (blue colour) cloaks much of the land in the wider western and northern extents of the study area and presents with a 'sand-ripple' effect as a result of the numerous Drumlin-like formations in the surrounding wider landscape.

14.5.3.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within County Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guidebooks, roadside rest stops or on post cards that represent the area.

All of the scenic routes (SR) and views in Clare and in both Limerick and Tipperary that fall inside the ZTV pattern (see **Figure 14.6** above) were investigated during fieldwork to determine whether actual views of the proposed wind farm might be afforded. Where visibility may occur, a viewpoint has been selected for use in the visual impact appraisal later in this chapter. In some instances, a single viewpoint is selected to represent a stretch of designated scenic route or a cluster of designated scenic views, particularly distant ones (refer to **Table 14.6** below).

Table 14.6 Rationale for selection of scenic designations within relevant County Development Plans

Scenic View ref:	Relevance to visual impact appraisal?	VP ref no. herein
Clare County Development Plan 2023-2029 – Scenic Designations		
SR21	Not Relevant - Whilst the ZTV identifies the potential for views in the direction of the site, this scenic route is c. 15km east of the site and the main aspect of amenity is to the west and south towards the Shannon Estuary in the opposite direction to the Proposed Development.	-

Scenic View ref:	Relevance to visual impact appraisal?	VP ref no. herein
SR22	Yes Relevant -ZTV identifies the potential for views in the direction of the site. However, it is important to note that notable sections of this road are located outside of ZTV and/or afford views across the landscape to the northwest and west in the opposite direction to the Proposed Development.	Represent by VP23 situated less than 600m south of the nearest section of this scenic route
SR23	Yes Relevant -ZTV identifies the potential for views in the direction of the site. However, it is important to note that large sections of this road are located outside of ZTV and/or afford views across the landscape to the northwest in the opposite direction to the Proposed Development.	VP3
SR24	Yes Relevant -ZTV identifies the potential for views in the direction of the site.	VP4
SR26	Yes Relevant -ZTV identifies the potential for views in the direction of the site	VP3
SR27	Not Relevant -ZTV identifies no potential for visibility of the proposed turbines	-
SR28	Yes Relevant -ZTV identifies the potential for views in the direction of the site	VP1
SR29	Not Relevant -ZTV identifies no potential for visibility of the proposed turbines	-
Limerick County Development Plan 2022-2028 – Scenic Designations		
Elevated views at Glenstal	Yes Relevant -ZTV identifies the potential for views in the direction of the site. Nonetheless, these views are afforded from c. 20km southeast of the site. The potential visibility afforded from this aspect of the study area is represented by VP22.	VP22
Local views from Mungret	Yes Relevant -ZTV identifies the potential for views in the direction of the site. Potential visibility of the Proposed Development from Limerick City and its surrounding areas is represented by VP26. Furthermore, these scenic designations are located of c.14km from the turbines and have a limited potential to be notably impacted by the Proposed Development.	VP26

Scenic View ref:	Relevance to visual impact appraisal?	VP ref no. herein
Tipperary County Development Plan 2022-2028 – Scenic Designations		
V44	Not Relevant – Views located outside of ZTV pattern	-
V57	Yes Relevant -ZTV identifies the potential for views in the direction of the site	VP22
V59	Yes Relevant -ZTV identifies the potential for views in the direction of the site	VP22

Policy relating to scenic designations in Clare, Limerick and Tipperary County Development Plans is included below:

Clare CDP

Development Plan Objective 14.7: *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*

Limerick CDP

Objective EH 031: *It is an objective of the Council to:*

- a) Preserve, protect and encourage the enjoyment of views and prospects of special amenity value or special interests and to prevent development, which would block or otherwise interfere with views and/or prospects.*
- b) In areas where scenic views and prospects are listed in the Plan, there will be a presumption against development, except that required to facilitate farming and appropriate tourism and related activities. The development must be appropriately designed so that it can be integrated into the landscape.*

Tipperary CDP

Planning Policy 11-17: *“Ensure the protection of the visual amenity, landscape quality and character of designated ‘Primary’ and ‘Secondary’ amenity areas. Developments which would have a significant adverse material impact on the visual amenities of the area will not be supported. New development shall have regard to the following:*

- a) Developments should avoid visually prominent locations and be designed to use existing topography to minimise adverse visual impact on the character of primary and secondary amenity areas.*
- b) Buildings and structures shall integrate with the landscape through careful use of scale, form and finishes.*

c) Existing landscape features, including trees, hedgerows and distinctive boundary treatment shall be protected and integrated into the design proposal.”

14.5.3.3 Centres of Population

The most notable centre of population in relation to the Proposed Development is the settlement of Limerick City, which is situated in the southern half of the study area along the River Shannon corridor and is some c. 9km south of the nearest turbine at its nearest point. Other sizeable settlements within the study area include Shannon and the wider outskirts of Ennis, both of which are situated in the wider western half of the study area. Shannon is located some c. 12km southwest of the site, whilst the wider suburban areas of Ennis are situated some c. 19km northwest of the proposed turbine array. Aside from these settlements, the study area also encompasses a dispersed rural population of one-off dwellings, linear clusters of residential dwellings and small farmsteads.

The small cross-road settlement of Oatfield, which comprises a small cluster of dwellings and a local church, is situated some 1km southeast of the nearest turbine at its nearest point, whilst the more notable settlement of Broadford is located just over 1.5km north of the nearest turbine at its nearest point. Other settlements within the central study area include Kilkishen, located some c. 4.8km northwest of the turbine array, Kilbane located 5km east of the turbine array and the modest-sized settlement of Sixmilebridge, situated some 5km southwest of the proposed turbine array at its nearest point. The settlement of Cratloe is located to the south of Sixmilebridge and is some c. 8km southwest of the site at its nearest point.

In the wider extent of the study area, several settlements are located along the River Shannon/Lough Derg corridor and its wider extent and include (north to south) Tuamgraney, Scariff, Killaloe, Ballina, Birdhill, O'Briensbridge and Ardnacrusha. Similarly, a string of town and village settlements are located along the rolling hills in the northern half of the study area and include Bodyke, Tulla and Quin. The settlements of Newmarket on Fergus and Bunratty are both located in the wider southwest quadrant of the study area.

14.5.3.4 Transport Routes

The study area encompasses several major transport routes, many of which connect to the settlement of Limerick City in the southern half of the study area. The most notable major transport corridors include the M7 motorway located throughout the southeast quadrant of the study area some c. 13km from the site at its nearest point, the M18 motorway corridor situated throughout the wider western half of the study area some c. 13km from the site and the M20 motorway located some c.14km south of the site. The N18, N24 and N69 all traverse the wider southern half of the study area, the nearest of which is the N18, located just over c. 8km southwest of the site.

With regard to the central study area, several regional road corridors traverse to the east, south and west of the site. The R471 regional road is the closest major route to the Proposed Development and passes less than c.700m south of the nearest turbine. The R465 regional road traverses the central study area in a north-south direction, passing through the settlement of Broadford and is located just over c. 1km east of the nearest turbine. The R466 intersects the R465 at Broadford and is located c. 1.5km northeast of

the site at its nearest point. Brief sections of the R462 also penetrate the wider periphery of the study area in its northwest quadrant.

Otherwise, the central study area comprises an intersecting network of local roads that crisscross the landscape in the vicinity of the site, many of which are concentrated on the lower-lying parts of the study area. The nearest of these occur to the north and west of the site.

14.5.3.5 Tourism, Recreational and Heritage Features

The study area is richly diverse in terms of landforms, landscape features and areas of settlement. Thus, it encompasses a wide range of varying tourism, amenity and heritage receptors. Within the central study area, the most notable aspect of amenity relates to the elevated lands that encompass local trails and waymarked walking routes. The most notable of these is the East Clare Way, a 180km looped walking trail that traverses the elevated lands in the immediate surrounds of the site. The route passes just over c. 100m north of turbine T6 at its nearest point. The central study area also encompasses the 12 O'clock Hills Looped Walks, which comprises looped forested walks along elevated and sloping lands immediately north of the site. Several other local walks are also located in the southern half of the central study area and include Kilnacreagh Loop Walk and a local walk to the Woodcock Hill Radar located on the southern periphery of the central study area.

Several lakes are also located within the central study area in its northern aspect and present with notable recreational amenity values. Doon Lough is one of the more notable of these and is situated 3.3km north of the site. Doon Lough encompasses a local swimming spot and picnic area, whilst Doon Wood, located immediately east of the lake, comprises local walking trails.

The wider study area also encompasses numerous notable amenity and heritage features. In terms of prominent walking and hiking routes, the Lough Derg Way passes through the eastern and southern aspects of the wider study area, following Lough Derg in the northeast quadrant of the study area and the corridor of the River Shannon and Ardnacrusha Headrace Canal in the eastern and southeast quadrants of the study area. The Lough Derg Way is located some 8.6km southeast of the site at its nearest point. Lough Derg and the River Shannon are both notable aspects of amenity within the wider study area and are renowned for boating and angling. Located on the opposite side of the study area to the northwest of the site is the Mid Clare National Waymarked trail, a 130km looped walking trail situated c.11.3km northwest of the site at its nearest point.

The wider study area also comprises several notable heritage features. One of the most notable of these is Bunratty Castle, situated along the corridor of the Owengarney River, some c. 10.5km southwest of the site. Bunratty Castle is a 15th-century tower house located in the centre of the heritage settlement of Bunratty and is a popular attraction among domestic and international tourists.

King Johns Castle is situated along the banks of the River Shannon in the centre of Limerick City and is some c. 11km south of the nearest turbine in the proposed array. King Johns Castle dates back to the 13th Century and is located on Kings Island in Limerick City and is a notable tourist attraction in the centre of Limerick.

The wider study area also encompasses numerous other attractions, heritage features and local amenities, including Craggaunowen Castle and Crannog, Knappogue Castle, Quin Friary, Dromoland Castle and Golf Club and Mooghaun Fort. In addition, several golf clubs and local heritage features, such as old churches and graveyards, are also situated throughout the wider study area.

14.5.4 Identification of Viewshed Reference Points as a Basis for Assessment

The results of the ZTV analysis provide a basis for the selection of Viewshed Reference Points (VRP's), which are the locations used to study the landscape and visual impact of the proposed wind farm in detail. It is not warranted to include each and every location that provides a view of this development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Proposed Development. Instead, a variety of receptor locations was selected that are likely to provide views of the proposed wind farm from different distances, different angles and different contexts.

The visual impact of a proposed development is assessed using up to 6 categories of receptor type as listed below:

- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (DSR/SV);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR); and
- Amenity and heritage features (AH);

Where a VRP might have been initially selected for more than one reason it will be assessed according to the primary criterion for which it was chosen. The characteristics of each receptor type vary as does the way in which the view is experienced. These are described below.

Key Views

These VRPs are at features or locations that are significant at the national or even international level, typically in terms of heritage, recreation or tourism. They are locations that attract a significant number of viewers who are likely to be in a reflective or recreational frame of mind, possibly increasing their appreciation of the landscape around them. The location of this receptor type is usually quite specific.

Designated Scenic Routes and Views

Due to their identification in the County Development Plan this type of VRP location represents a general policy consensus on locations of high scenic value within the Study Area. These are commonly elevated, long distance, panoramic views and may or may not be mapped from precise locations. They are more likely to be experienced by static viewers who seek out or stop to take in such vistas.

Local Community Views

This type of VRP represents those people who live and/or work in the locality of the Proposed Development, usually within a 5 km radius of the site. Although the VRPs are generally located on local level roads, they also represent similar views that may be available from adjacent houses. The precise location of this VRP type is not critical; however, clear elevated views are preferred, particularly when closely associated with a cluster of houses and representing their primary views. Coverage of a range of viewing angles using several VRPs is necessary in order to sample the spectrum of views that would be available from surrounding dwellings.

Centres of Population

VRPs are selected at centres of population primarily due to the number of viewers that are likely to experience that view. The relevance of the settlement is based on the significance of its size in terms of the Study Area or its proximity to the site. The VRP may be selected from any location within the public domain that provides a clear view either within the settlement or in close proximity to it.

Major Routes

These include national and regional level roads and are relevant VRP locations due to the number of viewers potentially impacted by the Proposed Development. The precise location of this category of VRP is not critical and might be chosen anywhere along the route that provides clear views towards the proposal site, but with a preference towards close and/or elevated views. Major routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

Tourism, Recreational and Heritage Features

These views are often one and the same given that heritage locations can be important tourist and visitor destinations and amenity areas or walking routes are commonly designed to incorporate heritage features. Such locations or routes tend to be sensitive to development within the landscape as viewers are likely to be in a receptive frame of mind with respect to the landscape around them. The sensitivity of this type of visual receptor is strongly related to the number of visitors they might attract and, in the case of heritage features, whether these are discerning experts or lay tourists. Sensitivity is also heavily influenced by the experience of the viewer at a heritage site as distinct from simply the view of it. This is a complex phenomenon that is likely to be different for every site. Experiential considerations might relate to the sequential approach to a castle from the car park or the view from a hilltop monument reached after a demanding climb. It might also relate to the influence of contemporary features within a key view and whether these detract from a sense of past times. It must also be noted that the sensitivity rating attributed to a heritage feature for the purposes of a landscape and visual assessment is not synonymous with its importance to the Archaeological or Architectural Heritage record.

The Viewshed Reference Points selected in this instance are set out in the **Table 14.7** and **Figure 14.7** below.

Table 14.7 Outline Description of Selected Viewshed Reference Point (VRPs)

VRP No.	Location	Distance to nearest turbine	Representative of	Direction of view
VP1	R461 at Main Street Scarriff	15.2km (T10)	CP, DSR	SW
VP2	Tulla Church and Graveyard	11.3km (T1)	AH, CP	SE
VP3	R466 regional road east of O'Callaghs mills	5.9km (T10)	CP, MR, DSR	S
VP4	R462 at Ballyblood north of Lough Cullaunyheda	7.8km (T1)	DSR, MR	SE
VP5	Quin Village Playground	11.7km (T1)	CP, AH	SE
VP6	Clonlea Cemetery	4.6km (T1)	CP, AH	SE
VP7	St. Peter's Church, Broadford	2.0km (T10)	CP, LCV, AH	S/SW
VP8	St. Mary's Church, Kilbane	5.1km (T9)	AH	SW
VP9	L3080 at Druminarela	2.2km (T1)	LCV	S/SE
VP10	Kilmurry Graveyard	5.7km (T1)	CP, AH	SE
VP11	Local road at Pollagh	2.7km (T1)	LCV	E/SE
VP12	Local road at Drumsillagh east of the Drumsillagh River	1.1km (T9)	LCV	NW/W
VP13	Local road at Sprinmount	4.3km (T9)	LCV	W
VP14	Gleann Cora Residential Estate, Newmarket on Fergus	12.3km (T2)	CP, AH	E
VP15	Local access lane at Cloontra	0.8km (T7)	LCV	NE/W
VP16	Local access lane at Oatfield	0.8km (T4)	LCV	NW
VP17	R471 at Cloughoolia	1.2km (T2)	MR, LCV	N/NE
VP18	Local road intersection of the R471 at Oatfield	1.2km (T4)	CP, LCV, MR	N
VP19	Local road at Drumsillagh	4.1km (T7)	LCV	NW
VP20	Sixmilebridge GAA	5.7km (T2)	CP	NE
VP21	Local road at Corlea	2.7km (T2)	LCV	NE
VP22	R504 overbridge of the M7 at Touknockane	14.5km (T9)	MR, DSR	NW
VP23	Woodcock Hill Radar	4.9km (T4)	AH, SC, DSR	N
VP24	R463 overbridge of the Headrace Canal	8.4km (T7)	CP, MR	N

VP25	Bridge over the Owengarney River adjacent to Bunratty Castle	10.8km (T2)	AH, MR, CP	NE
VP26	Thomond Bridge	11.2km (T4)	AH, CP	N

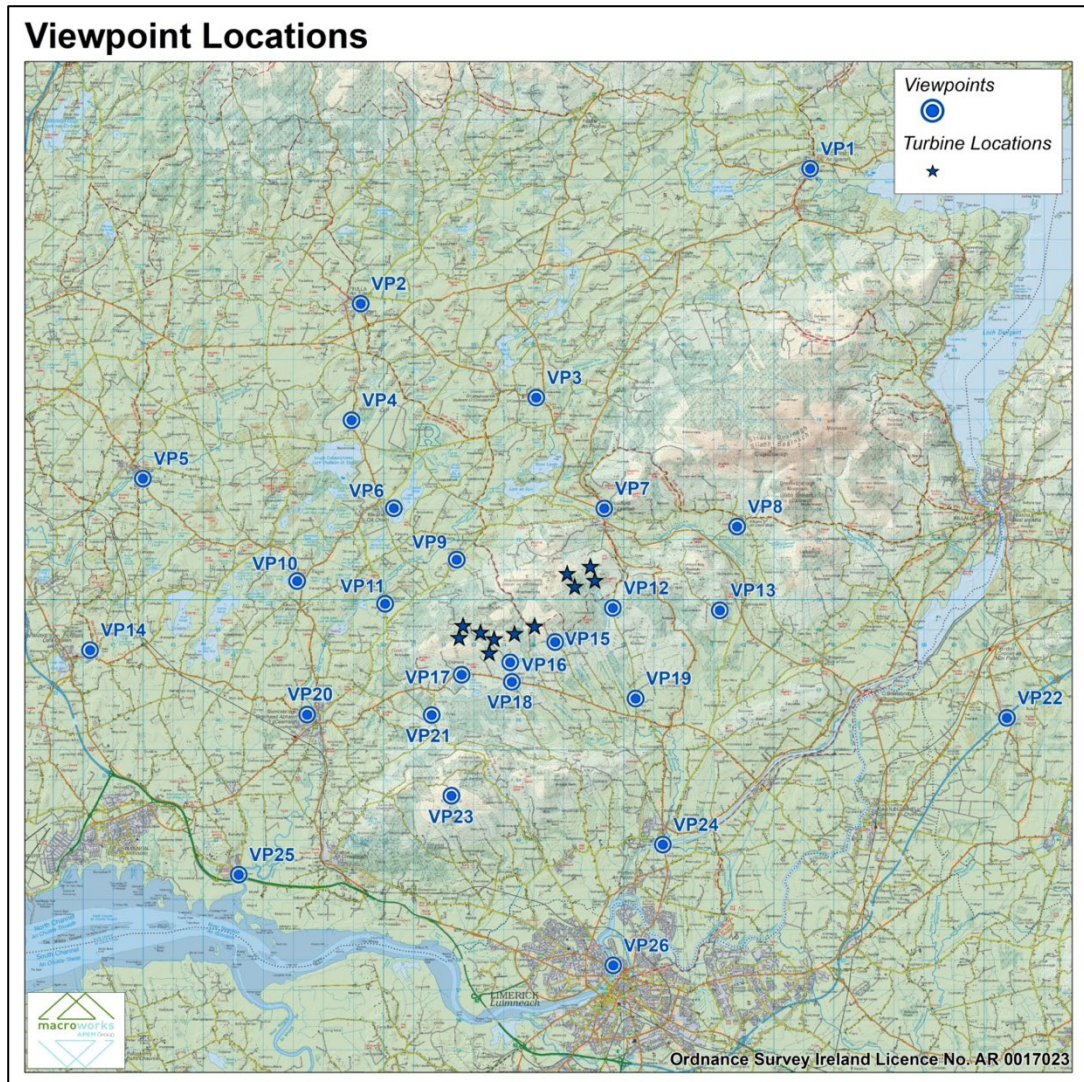


Figure 14.7 Map of Viewpoint Locations (See Appendix 14.3 for larger scale map)

14.6 Potential Effects of the Proposed Development

Based on the assessment criteria employed herein, potential significant effects are considered most likely to occur in instances where highly sensitive landscape and visual receptors coincide with high order landscape and visual effects (see descriptions **Table 14.1**, **Table 14.2** and **Table 14.3**). From Macro Works previous experience of this type of development in a rural transitional setting, it is considered that potentially significant landscape and visual impacts have the potential to occur in the following ways:

Landscape Impacts

- Irreversible physical effects on sensitive landscape features
- Disruption of sensitive land cover and/or land use patterns
- Substantial and incongruous change to areas of sensitive landscape character

Visual Impacts

- A sense of spatial dominance as seen from highly sensitive receptor locations. This is most likely to occur within 3km of the Proposed Development.
- Visual clutter and ambiguity as seen from highly sensitive receptor locations. This can occur at any distance but tends to occur beyond 2-3km as turbines become stacked in perspective and a more two-dimensional layout is perceived.
- A combination of both of the above effects.

From early-stage constraint studies, baseline assessments and fieldwork investigation specific to the Proposed Development, some of the most susceptible physical landscape receptors within the study area are considered to be the lakelands located throughout the northern extent of the central study area, the uplands in the northern extent of the wider study area and Lough Derg and the River Shannon corridor in the eastern and southern extents of the study area. Whilst there is some sensitivity associated with the elevated lands in the surrounds of the site and in the southern aspect of the central study area, this comprises a notable utilitarian character due to the extensive areas of conifer forestry, numerous major routes and telecommunication towers and radar equipment (Woodcock Hill).

With regard to visual receptors, the most sensitive visual receptors in this instance are considered to be the local residential receptors located in the immediate vicinity of the development located along the sloping landscape north and south of the site. The settlement of Broadford is a notable visual receptor in this instance due to its proximity to the northern aspect of the development and as a result of its relatively pleasant and contained location situated along the valley of the Broadford River. Other sensitive visual receptors within the central study area also include users of the East Clare Way and areas that present with a strong sense of amenity, such as Doon Lough. The central and wider study area also encompasses numerous scenic view designations (identified in the current Clare, Tipperary and Limerick County Development Plan), whilst other sensitive heritage receptors within the wider study area include Bunratty Castle and King Johns Castle, located in the southern half of the wider study area.

14.7 Mitigation Measures

14.7.1 Construction Phase

Aside from construction stage mitigation measures to minimise land and vegetation disturbance and dust emissions (which may reduce visual amenity), there are no specific mitigation measures to be implemented. The appropriate management and reinstatement of excavations, in a timely manner, will ensure that any adverse effects caused, for example at site entrances or road upgrade locations, are minimised insofar as possible.

Similarly, the progressive reinstatement and landscaping of the site will remediate any short term adverse effects on the local landscape.

14.7.2 Operational Phase

Given the highly visible nature of commercial wind energy developments it is not generally feasible to screen them from view using on-site measures as would be the primary form of mitigation for many other types of development. Instead, landscape and visual mitigation for wind farms must be incorporated into the early-stage site selection and design phases.

In this instance, the two main forms of landscape and visual mitigation employed were:

- Mitigation by avoidance and design
- Buffering of Residential Receptors

14.7.2.1 Mitigation by Avoidance and Design

The principal mitigation measure in this instance is the siting of the Proposed Development in a relatively robust elevated setting that is classified as a 'Strategic Area' in relation to wind farm development in the current Clare County Development Plan. This highlights the robust nature of this landscape setting, which is offset from some of the more highly sensitive landscape and visual receptors within the wider landscape. In the case of the proposed wind farm, the guidance provided in the *Wind Energy Development Guidelines for Planning Authorities 2006* (and draft 2019 revision) was the one of the principal measures considerations. The relevant guidance for the landscape types that constitute the landscape and visual setting of the wind farm are discussed in detail in Section 14.5.2.1 above. It is considered that the wind farm is broadly in line with the recommendations contained within the Guidelines.

Some of the general mitigation measures that will be implemented to make the development less intrusive and less eye catching on a localised level include:

- The colour will be industry standard off-white/light grey semi-matt non-reflective finish;
- Electricity lines between individual turbines and the substation, and the grid connection infrastructure, will be placed underground;
- Special care will be taken to preserve any features, insofar as possible, which contribute to the landscape character of the study area; and
- Counter rotation of blade sets will be avoided.
- The removal of areas of existing vegetation will be avoided in so far as possible.

14.7.2.2 Buffering of Residential Receptors

For the Proposed Development, the minimum distance of any turbine from the nearest residential receptor is 725m, which is in excess of the draft Wind Energy Development Guidelines (2019) minimum set back of 500m and greater than the setback distance of 4 times the tip height of the proposed turbines. In this instance the setback distance for visual amenity purposes would be 720m from residential receptors on the basis of the

180m high turbines (this represents the greatest potential setback distance with regard to all potential turbines ranges).

One dilapidated property is located within the 720m setback distance. However, the property owners are involved in the Proposed Development and have agreed to and accepted the siting of the wind turbines. In accordance with Section 6.18.2 of the *Draft Revised Wind Energy Development Guidelines 2019*, written confirmation of the residents' acceptance of this reduced separation distance has been submitted in accompaniment of the planning application.

Variation in residential buffer distances within the nearest kilometre has a much more noticeable effect on perceived turbine scale than when it occurs in the context of more distant views. This is due to the law of perspective – that doubling the distance to an object halves its perceived height. The reduction factor is even more pronounced when considered in the context of the 'swept area' of turbine blades and not just their tip height. This exponential 'scale in relation to distance' scenario is illustrated in **Figure 14.8** below.

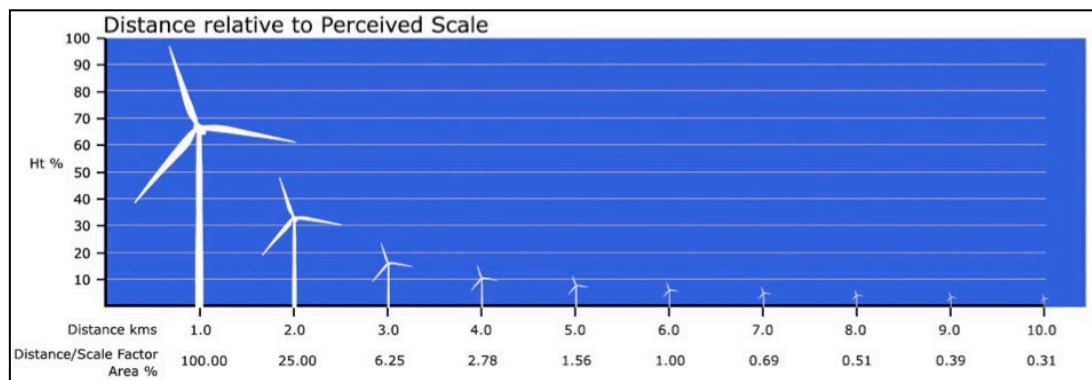


Figure 14.8 Turbine 'scale in relation to distance' relationship

14.7.3 Decommissioning Phase

The turbines are expected to be fully operational for up to 35-years. After this period, and if planning permission is not sought for an extension of this use at the site, the turbines and ancillary developments will be deconstructed and removed from the site with the exception of electricity grid infrastructure which may remain as part of the national grid network in perpetuity. Aspects of the ancillary site development including the access tracks may be retained in-situ. These may facilitate the use of the site for, as stated, suitable future development uses including animal grazing and forestry.

14.8 Residual Effects

14.8.1 Do-Nothing Scenario

In this instance the do-nothing effect would be that the receiving landscape stays in the same or similar condition as it currently is, managed for a combination of pastoral farmland and forestry.

14.8.2 Landscape Impacts

Landscape impacts are assessed on the basis of landscape sensitivity weighed against the magnitude of physical landscape effects within the Proposed Development and effects on landscape character within the wider landscape setting. This wider setting is considered in respect of the immediately surrounding landscape (<5 km) as well as the broader scale of the Study Area (5-20km).

14.8.2.1 Landscape Character, Value and Sensitivity

Central Study Area (<5km)

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the Proposed Development site and wider Study Area.

The central study area comprises varied terrain and is heavily influenced by the Broadford Hills, which are one of the principal landscape features within the study area. The Broadford Hills are not highly distinctive, albeit they provide some elevated views across the central and wider study area and beyond. In terms of land use, much of the immediate study area is influenced by transitional land uses such as small agricultural fields and extensive areas of commercial conifer forestry, whilst some localised areas of moorland are situated along the most elevated hilltop summits. Downslope from the more elevated lands within the immediate context of the site, the residential settlement pattern increases, especially in the vicinity of the surrounding regional roads, where a number of linear clusters of residential dwellings occur. Overall, despite the elevated nature of some parts of the study area, this is a predominately rural landscape, denoted by the dense networks of pastoral fields, which are the predominant land use within the central study area.

Whilst much of the central study area is not considered highly rare or distinctive, it does encompass some susceptible landscape features, such as Doon Lough, located to the northwest of the settlement of Broadford. One of the larger lakes within the central study area, Doon Lough, presents with landscape values associated with recreational amenity, naturalistic qualities and a notable degree of scenic amenity.

With regard to landscape designations, the transitional nature of the central study area is highlighted by the contrasting landscape types and landscape character areas located within the central study area, which include the 'Slieve Bernagh Uplands', the 'East Clare Loughlands' and 'Sixmilebridge Farmland'. The modified nature of the central study area is also reinforced within the current Clare CDP as the southern half of the central study area is located with the more robust 'working landscapes' designations, whilst the northern half of the central study area is contained within the 'settled landscape' classification, which cloaks the majority of Clare's rural landscape.

In terms of designated scenic amenity, the central study area encompasses several designated scenic routes, which are principally associated with the elevated terrain within and around the Broadford Hills. Two scenic routes are located in the northeast quadrant of the study area along the R466 adjacent to Doon Lough and along a section of the R466 south of Broadford. Whilst some brief elevated views are afforded from the most northern aspect of this route, much of these road corridors is heavily contained by dense

vegetation or the surrounding steeply sloping terrain, which is likely the reason for their designation. In contrast, the two scenic routes located in the southwest quadrant of the study area afforded broad elevated views across the surrounding lowlands intersected by small lakes and rolling hills.

Despite the degree of designated scenic amenity with the surrounding local landscape, the study area presents with a notable utilitarian character influenced by the extensive areas of commercial conifer forestry, the numerous major routes and the telecommunication infrastructure located along some of the elevated lands. Overall, it is considered that this is a transitional rural landscape situated to the south of the Slieve Bearnagh Mountains that is not highly rare or distinctive. Whilst some localised areas present with susceptible landscape values relating to scenic amenity, recreation and the naturalistic, overall, the predominant landscape values relate to the subsistence of the rural economy. As a result of the reasons outlined above, the overriding landscape sensitivity within the central study area is deemed **Medium**, with some localised areas of higher sensitivity.

Wider Study Area (c.5-20km)

The wider study area comprises a combination of land uses, landscape types and landscape features, some of which are highly sensitive, whilst others have a strong utilitarian character. In terms of the principal landscape features within the wider study area, the Slieve Bearnagh range rises to a max height of 526m AOD and is the tallest landscape feature throughout the central and wider study area. This upland area occupies a notable extent of the northeast quadrant of the study area and is cloaked in considerable areas of conifer forest and some notable areas of mountain moorland. This mountainous area is situated to the southwest and west of Lough Derg and the Shannon corridor, which is the primary watercourse within the study area and has a notable influence on the eastern and southern extents of the study area. Lough Derg and the Shannon present with highly susceptible landscape values associated with scenic amenity, the naturalistic and recreational amenity. Several designated scenic routes in both Clare and Tipperary are located along the immediate corridor of the River Shannon.

The wider study area also comprises numerous sensitive heritage receptors, including Bunratty Castle and King Johns Castle. Several stately homes and demesne landscapes are also located throughout the wider study area, one of the more prominent of which is Dromoland Castle and Demesne, which is currently in use as a 5-star hotel and Golf Club.

Notwithstanding the above, the wider study area has a strong utilitarian character, especially in its southern extent, where the sizeable settlement of Limerick City is located. This aspect of the study area also encompasses numerous motorways and national route corridors and accounts for the most notable area of urban land use within the wider study area. However, several other notable settlements are also situated within the wider study area, including Shannon, Sixmilebridge, and the wider surrounds of Ennis. Numerous small villages and towns are also located along the corridor of the Shannon and in the rolling elevated lands in the northern and western aspects of the wider study area. Shannon Airport is located in the southwest quadrant of the wider study area and is one of the most extensive single land uses throughout the entire 20km study extent.

As a result of the reasons outlined above, it is considered that the wider study area is richly diverse in terms of landscape types, areas, features and land uses. The location of Limerick City imparts a notable anthropogenic character on large parts of the southern half of the study area, whilst the northeast quadrant of the study area encompasses some highly sensitive landscape areas associated with the uplands and Lough Derg. Overall, the southern and western half of the study area are considered to be consistent with a **medium-low landscape sensitivity** as they are influenced by the urban settlement of Limerick City, Shannon and Ennis. Nevertheless, the northern, especially the north-eastern aspects of the study area, comprise some distinctive landscape features and landscape areas and are classified with a localised High-medium landscape sensitivity.

14.8.2.2 *Magnitude of Landscape Impacts – Construction Phase*

The physical landscape, as well as the character of the wind farm site and its immediate surrounds, will be affected by the wind turbines as well as ancillary development such as access tracks, areas of hardstanding and site entrances. By contrast, for the wider landscape of the study area, landscape impacts relate almost exclusively to the influence of the wind turbines on landscape character.

It is considered that the Proposed Development (wind farm site itself) will have a modest physical impact on the landscape within the site as none of the wind farm infrastructure has a significant ‘footprint’. The topography and land cover of the wind farm site will remain largely unaltered with construction being limited to turbine locations, access tracks and site entrances, areas of hardstanding, the proposed onsite substation compounds, spoil deposition areas, the temporary site construction compound and underground cabling.

The finalised internal access track layout has been designed to avoid environmental constraints, and every effort has been made to minimise the length of necessary newly constructed roadway whilst utilising existing tracks within the site. It is proposed to construct some 8.5km of new access tracks within the site. The access track layout has been designed to follow the natural contours of the land where possible. All internal and grid connection cabling will be located underground. Indeed, the land cover of the wind farm site will only be interrupted as necessary to build the structures of the wind farm and to provide access.

One permanent meteorological (Met) mast will be erected on site and will comprise of a 100m high lattice steel mast with a shallow concrete foundation. The proposed mast will be a slender, free-standing structure and will be constructed on a hardstanding area of approximately 8m x 8m. The most notable construction stage effects here relate to the minor amount of ground excavation required to facilitate the shallow foundations for the steel mast structures.

There will be one 110kV on-site substation compound constructed to collect the generated power from the Proposed Development. The 110kV on-site substation will be located in an area of existing scrub, which will be cleared to facilitate the full footprint of the proposed substation development. The dimensions of the proposed substation compound will be up to 177m in length by 89m in width and will comprise one control building with a pitched roof and will have a concrete render finish (18m x 25m and 8.7m in height) and electrical components necessary to export generated power from the wind to the transmission system. A second smaller switchgear building will also be constructed

within the substation compound, whilst the compound of the proposed substation will be surrounded by steel palisade fencing which will be approximately 2.6m in height. The most notable construction stage landscape impacts resulting from the proposed on-site substation relate to the construction of concrete foundations to facilitate the substation building. Overall, these construction stage effects are relatively minor and compare to the construction of an industrial farm shed.

Whilst some of the access tracks and turbine locations will be located in open pastoral fields or areas of scrub, some turbines and sections of access track are proposed to be situated in areas of existing conifer woodland. As a result, **c. 54ha** of tree felling will be required to facilitate proposed infrastructure, including turbine hardstand and set down areas and access tracks. Impacts from land disturbance and vegetation loss at the site are considered to be relatively minor in the context of this modified and managed landscape setting where the felling and replanting of forestry is common practice.

Replanting of forestry in Ireland is subject to license in compliance with the Forestry Act 2014 as amended. The consent for such replanting is covered by the Forestry Regulations 2017 (S.I. No. 191 of 2017). The associated afforestation of alternative lands equivalent in area to those lands being permanently clear felled is also subject to licensing ('afforestation licensing'). Refer to EIAR Chapter 7 Biodiversity for further information on this point.

The grid connection will run from the Proposed Development site across public roads which will generate some land disturbance works and the removal of some small pockets of vegetation. This will require ground excavation, laying of cables and subsequent reinstatement of trenches, and will result in minor and very localised construction stage landscape effects. The grid connection to the national grid will be via a loop-in 110 kV underground cable connection to the existing 110kV overhead line, with 2 no. new 16m steel lattice end masts & associated overhead line electrical infrastructure, at the interface with the existing overhead line. This will result in some localised minor landscape effects in the surrounds of the two new pylon structure, which relates physical landscape impacts generate from the construction of concrete pad foundations to facilitate the pylon structures. There will also be a marginal increase in the intensity of development noted in the immediate surrounds of the new pylon structures.

Minor and temporary land disturbance is likely to occur as a result of the proposed haul route works; however, these effects will be temporary and reversible and therefore are not assessed to be significant.

Site activity will be at its greatest during the construction phase due to the operation of machinery on site and movement of heavy vehicles to and from site. This phase will have a more significant impact on the character of the site than the operational phase but is a 'short-term' impact that will cease as soon as the wind farm is constructed and becomes operational (approximately 18 - 24 months from the commencement of construction).

There will be some construction stage effects on landscape character generated by the intensity of construction activities (workers and heavy machinery) as well as areas of bare-ground and stockpiling of materials as identified in the Construction and Environmental Management Plan (CEMP). Such effects will be temporary/short term in duration and, therefore, not considered to be significant.

Overall, the magnitude of construction stage landscape impacts within the site and its immediately surrounding context is deemed to be **High-medium** and of a **Negative** quality, but of a **Short-term** duration.

Significance of Construction Stage Effects

The significance of landscape effect is a function of landscape sensitivity weighed against the magnitude of construction stage landscape impact. This is derived from the significance matrix (**Table 14.4**) used in combination with professional judgement.

Based on a Medium sensitivity judgement and a High-Medium magnitude of construction stage landscape impact, the significance of impact is considered to be **Substantial-Moderate / Negative / Long-term** within and immediately around the site. Thereafter, significance will reduce to 'Moderate', 'Slight' and Imperceptible at increasing distances as the development becomes a progressively smaller component of the wider landscape fabric even in the context of higher sensitivity landscape units / features.

14.8.2.3 Magnitude of Landscape Impacts – Operational Phase

For most commercial wind energy developments, the greatest potential for landscape impacts to occur is as a result of the change in character of the immediate area due to the introduction of tall structures with moving components. Thus, wind turbines that may not have been a characteristic feature of the area become a new defining element of that landscape character. In this instance, wind turbines are not a characteristic feature of the central and wider study area, albeit, two small single turbines are located in the wider southern extent of the study area along the outer edge of suburban Limerick. Thus, the effect therefore, is principally the introduction of a new land use in this context, as opposed to the intensification of an established form of development. Notwithstanding, wind turbines are commonplace throughout the rural Irish environs, with numerous developments located in the wider landscape beyond the 20km study area.

In terms of scale and function, the proposed wind farm is well assimilated within the context of the Central Study Area, which is characterised by a plateau of broad hills and ridges and extensive areas of commercial conifer forestry. These broad-scale landforms and land uses prevent the height and extent of the proposed wind farm causing the type of scale conflict that can occur in more intricate landscape areas. The broad hills and ridges in the immediate surrounds of the wind farm site comprise a notable utilitarian character due to the presence of working rural land uses such as agriculture and commercial scale forestry in addition to some telecommunication structures. Although the Proposed Development represents a stronger human presence and level of built development than currently exists on the site, it will not detract significantly from the working rural character of the surrounding elevated hills and ridges.

It is important to note that in terms of duration, this development proposal represents a long term, but not permanent impact on the landscape and is reversible. The lifespan of the Proposed Development is 35 years, after which time it will be dismantled and the landscape reinstated to prevailing conditions. Within 2-3 years of decommissioning there will be little evidence that a wind farm ever existed on the site.

In summary, there will be physical impacts on the land cover of the site as a result of the wind farm during the operational phase, but these will be relatively minor in the context

of this productive working landscape that comprises extensive commercial conifer forests and other typical working rural land uses. The scale of the wind farm will be well assimilated within its landscape context without undue conflicts of scale with underlying land form and land use patterns. For these reasons, the magnitude of the landscape impact is deemed to be **'High-medium'** with the immediate site context reducing to Medium within the Central Study Area. Beyond 5km from the site, the magnitude of landscape impact is deemed to reduce to Low and Negligible at increasing distances as the wind farm becomes a proportionately smaller component of the overall landscape fabric.

Significance of Operational Phase Effects

The significance of landscape effect is a function of landscape sensitivity weighed against the magnitude of operational phase landscape impact. This is derived from the significance matrix (**Table 14.4**) used in combination with professional judgement.

Based on a Medium sensitivity judgement and a High-Medium magnitude of operational stage landscape impact in the immediate context of the site, the significance of impact is considered to be **Substantial-Moderate / Negative / Long-term** within and immediately around the site. Thereafter, significance will reduce to 'Moderate', 'Slight' and Imperceptible at increasing distances as the development becomes a progressively smaller component of the wider landscape fabric even in the context of higher sensitivity landscape units / features.

14.8.2.4 Magnitude of Landscape Impacts – Decommissioning Phase

It is important to note that in terms of duration, this development proposal represents a long term, but not permanent, impact on the landscape and is reversible. The lifespan of the Proposed Development is 35-years, after which time it will be dismantled (unless planning permission shall have been obtained for its continued use) and the landscape reinstated to prevailing conditions. Within 2-3 years of decommissioning, there will be little evidence that a wind farm ever existed on the site.

The decommissioning phase will have similar temporary impacts as the construction phase with the movement of large turbine components away from the wind farm site. There may be a minor loss of roadside and trackside vegetation that has grown during the operational phase of the Proposed Development, but this can be reinstated upon completion of decommissioning. The existing turbine foundations will be left in situ and the surrounding ground will be let revegetate naturally. It is expected that the decommissioning phase will take approximately 6 months to complete.

Overall, the magnitude of decommissioning stage landscape impacts within the site and its immediately surrounding context is deemed to be **High-medium** and of a **Negative** quality, but of a **Short-term** duration.

Significance of Decommissioning Stage Effects

The significance of landscape effect is a function of landscape sensitivity weighed against the magnitude of decommissioning stage landscape impact. This is derived from the significance matrix (**Table 14.4**) used in combination with professional judgement.

Based on a Medium sensitivity judgement and a High-Medium magnitude of decommissioning stage landscape impact, the significance of impact is considered to be **Substantial-Moderate / Negative / Long-term** within and immediately around the site. Thereafter, significance will reduce to 'Moderate', 'Slight' and Imperceptible at increasing distances as the development becomes a progressively smaller component of the wider landscape fabric even in the context of higher sensitivity landscape units / features.

14.8.3 Visual Impacts

14.8.3.1 Sensitivity of Visual Receptors

Views of the agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and 'green', settled working character. The network of hedgerows and vegetation that occur throughout it contributes to some sense of naturalness and, in combination with its undulating topography, generates a high degree of containment in many locations. However, whilst the agricultural context forms the primary landscape and visual experience, the local landscape of the site and its immediate landscape has a working elevated character, which is evident through the extensive areas of commercial conifer forestry plantation that cloak the surrounding rolling elevated terrain. Whilst there are elevated areas within the immediate and central study area that present with pleasant views across the rolling elevated lands, the patchwork of transitional farmland, extensive areas of conifer woodland, and anthropogenic built features such as telecommunications masts and overhead line corridors demonstrate longstanding human intervention in the central study area.

Notwithstanding, there are some localised areas that present with a high degree of visual amenity, such as Doon Lough in the northern half of the study area, which is bound by a scenic route to the east along the R466 regional road. This Lough is provided a notable degree of containment by surrounding vegetation and, thus, results in some sense of localised tranquillity. Nonetheless, other sections of the same scenic route that pass east of Doon Lough and south of Broadford are afforded a high degree of containment by surrounding terrain and dense layers of vegetation. In the southwest quadrant of the central study area, two other scenic routes occur and extend in a general easterly/northeasterly direction from Cratloe. Both of these scenic routes traverse elevated terrain to the southwest of the site and are afforded broad views of the surrounding countryside and elevated lands. Nonetheless, the views afforded are typically to the north and west of a combination of the working lowlands and surrounding areas of conifer forest. Scenic views within the central and wider study area tend to vary between a 'high-medium' and 'medium' sensitivity classification, which is often dictated by any clear sense of openness and/or extensive visibility across the wider landscape.

Overall, views within the central study area in the direction of the site can be pleasant and impact somewhat of a pastoral aesthetic in some areas. However, these views are not considered to be highly distinctive or unique. In general, views within the study area tend to be typical and dominated by a mix of pastoral lands and elevated conifer forestry plantations. Some parts of the study area afford more broad distant views across the wider study area in the direction of more visually susceptible features, such as the Slieve Bearnagh Uplands and the Shannon River corridor; however, these are predominately viewed in the opposite direction to the Proposed Development.

The wider study area encompasses some highly sensitive visual receptors, which are typically associated with the numerous heritage features and highly sensitive landscape features such as the River Shannon corridor and/or surrounding Loughs. Nonetheless, the wider study area is also considered a highly modified landscape and comprises numerous large settlements, major routes and other anthropogenic built features which can limit any strong sense of uniqueness and high order visual amenity.

Overall, the sensitivity of visual receptors within the study area ranges between 'High' and 'medium-low', with those of a higher classification representing sensitive heritage features, scenic routes or areas of outdoor pursuits that present with a degree of scenic amenity/naturalness. Those of a 'medium' and 'medium-low' sensitivity are typically influenced by more typical rural vistas and surrounding anthropogenic built features such as roads, settlements, electrical infrastructure development etc.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes, where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located in closer proximity to the site are considered more susceptible to changes in views over those where views are experienced at a distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations contained in the methodology Section 14.4.2.2, visual receptor sensitivity judgements are provided for each representative viewpoint in the summary **Table 14.8** below.

14.8.3.2 Magnitude of Construction Stage Visual Impacts

During construction, the main visual impacts will arise from frequent heavy vehicle movements and worker vehicles travelling to and from the site and using the site entrance. In addition, there will be construction machinery on site, which may rise above intervening vegetation and buildings. There will also be stockpiles of stripped topsoil and construction materials awaiting use. Some of the most notable visual impacts will arise from the erection of tower cranes on-site, which will be used to raise the turbine components into place. Nevertheless, much of the ground-based construction stage works have the potential to be heavily screened by the surrounding layers of vegetation and/or will only be visible in the immediate surrounding landscape context. Furthermore, construction-related activity is short-term in nature and will cease once the development becomes fully operational. Thus, construction stage impacts are likely to result in a visual impact of High/High-medium in the immediate surroundings of the site.

Coupled with the Medium-low/Medium visual receptor sensitivities in the immediate surrounds of the site, the construction stage visual impacts in the immediate vicinity of the site are considered to be in the order of Substantial-moderate and Moderate, will be temporary in terms of their duration and be of a negative quality, albeit these effects will reduce considerably beyond the central study area. As a result, construction stage visual impacts are not considered to be significant.

14.8.3.3 Magnitude of Operational Stage Visual Impacts

Table 14.8 below summarises the full textual assessment of visual effects for each Viewshed Reference Point (VRP) contained in **Appendix 14.4**. Whilst the ‘receptor sensitivity analysis’ and full textual assessment for each VRP is normally contained within the landscape and visual chapter, in this instance, given the considerable number of VRPs, it is considered more prudent to place this material in a separate appendix and focus herein on the significance of the findings. The left-hand side of the table incorporates statistical data associated with the view of turbines, whilst the right hand side contains professional judgements in respect of the view. It is important to note that the professional judgements are based on the effects experienced in relation to the view and are not directly influenced by the statistical data. These aspects are only combined within **Table 14.8** in order to identify patterns of effect to better inform the conclusions of this assessment.

Table 14.8 Summary of Visual Effects at Viewshed Reference Points

VRP No.	Distance to nearest turbine	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Effect
VP1	15.2km (T10)	High-medium	Low-negligible	Slight-imperceptible / Negative / Long Term
VP2	11.3km (T1)	High-medium	Low-negligible	Slight / Negative / Long Term
VP3	5.9km (T10)	High-medium	Low	Slight / Negative / Long Term
VP4	7.8km (T1)	High-medium	Low	Slight / Negative / Long Term
VP5	11.7km (T1)	Medium	Low-negligible	Slight-imperceptible / Negative / Long Term
VP6	4.6km (T1)	Medium	Low	Slight / Negative / Long Term
VP7	2.0km (T10)	Medium	Medium	Moderate / Negative / Long Term
VP8	5.1km (T9)	Medium	Negligible	Imperceptible / Neutral / Long Term
VP9	2.2km (T1)	Medium	Medium	Moderate-slight / Negative / Long Term
VP10	5.7km (T1)	Medium	Low	Slight / Negative / Long Term
VP11	2.7km (T1)	Medium-low	Medium-low	Moderate-slight / Negative / Long Term
VP12	1.1km (T9)	Medium	High-medium	Substantial-moderate / Negative / Long Term

VRP No.	Distance to nearest turbine	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Effect
VP13	4.3km (T9)	Medium	Low-negligible	Slight-imperceptible / Negative / Long Term
VP14	12.3km (T2)	Medium-low	Negligible	Imperceptible / Neutral / Long Term
VP15	0.8km (T7)	Medium	Medium	Moderate / Negative / Long Term
VP16	0.8km (T4)	Medium	High	Substantial-moderate / Negative / Long Term
VP17	1.2km (T2)	Medium	High-medium	Substantial-moderate / Negative / Long Term
VP18	1.2km (T4)	Medium-low	High-medium	Substantial-moderate / Negative / Long Term
VP19	4.1km (T7)	Medium-low	Medium-low	Moderate-slight / Negative / Long Term
VP20	5.7km (T2)	Medium-low	Low	Slight / Negative / Long Term
VP21	2.7km (T2)	Medium	Medium	Moderate / Negative / Long Term
VP22	14.5km (T9)	Medium	Low-negligible	Slight-imperceptible / Negative / Long Term
VP23	4.9km (T4)	High-medium	Medium-low	Moderate-slight / Negative / Long Term
VP24	8.4km (T7)	Medium	Low	Slight / Negative / Long Term
VP25	10.8km (T2)	High	Low-negligible	Slight-imperceptible / Negative / Long Term
VP26	11.2km (T4)	High	Negligible	Imperceptible / Negative / Long Term

14.8.3.4 Impacts on Local Community Views

Local Community views are considered to be experienced by those people who live, work and move around the area within approximately 5km of the site. These are generally the people most likely to have their visual amenity affected by a wind energy proposal due to proximity to the turbines, a greater potential to view turbines in various directions, or having turbines as a familiar feature of their daily views.

Eleven views were selected to represent the local community (Viewpoints VP7, VP9, VP11, VP12, VP13, VP15, VP16, VP17, VP18, VP19 & VP21), some of which also represent amenity and heritage receptors, centres of population and major routes. The

sensitivity of these receptors ranges between 'medium' and 'medium-low', with those of a medium sensitivity representing slightly more open views across the rolling elevated landscape and/or more sensitive heritage receptors.

Four viewpoints were classified with a 'Substantial-moderate' visual impact significance (viewpoints VP12, VP16, VP17 & VP18), which relate to some of the nearest views afforded of the proposed wind farm development. All four of these views are located to the south of the main ridge that the Proposed Development is located across and are situated along the transitional lands, which are characterised by a combination of pastoral farmland and extensive areas of commercial conifer forestry.

Viewpoint VP16 is one of the nearest views afforded of the Proposed Development from local community receptors, where up to six of the turbines in the western extents of the array will be prominently visible along the sloping hillside. Although the turbines will be one of the defining features from this near viewing distance, they do not appear over-scaled and are well assimilated with the surrounding broad landscape features and underlying land uses.

VP17 affords an uphill view of the turbines from the R471 regional road, which is one of the busier routes within the central study area and is characterised by linear clusters of residential dwellings. VP17 represents one of the more open views along this route, which is otherwise heavily contained by surrounding hedgerow vegetation. In similar circumstances to VP16, the turbines will present with a dominant visual presence, which is slightly accentuated by the uphill nature of the view afforded.

VP18 affords a partial view of the three of the turbines through a gap in the roadside vegetation along a local road intersection of the R471 regional road at Oatfield. Whilst the partially visible turbines will generate some sense of visual ambiguity as to their actual location, they will only be briefly visible from this immediate local landscape context.

VP12 is located further to the east of the aforementioned viewpoints and affords a prominent view of the four easternmost turbines in the array from an elevated section of the local road. Whilst this section of the local road does not contain any residential development due to its relatively remote elevated nature, several isolated rural dwellings are located along its path further to the north and south. The four easternmost turbines will present in a dominant manner here, however, due to their loose spacing characteristics and the relatively open nature of the view, the Proposed Development will present with little notable negative aesthetic effects and does not appear over-scaled in the context of the extensive areas of surrounding conifer forestry.

Viewpoints VP7, VP15, and VP21 were all classified with a 'moderate' significance of visual impact. VP15 is the nearest of these viewpoints to the Proposed Development, situated some c. 850m from the nearest turbines. Nonetheless, due to the high degree of existing mature conifer woodland in the immediate surrounds of this local context, there will be limited potential for visibility of the Proposed Development in its entirety. Furthermore, many of the residential dwellings located along the sloping lands in the surrounds of this view are south-facing to benefit from locally elevated views across the surrounding rolling countryside in the opposite direction to the Proposed Development. Viewpoint VP21 is situated along locally elevated lands southwest of the site and will afford a view across the western extent of the array. Whilst the turbines will be a noticeable feature from this local landscape context and will marginally detract from the

visual amenity of this landscape context, they do not generate any sense of overbearing, nor do they appear incongruous in terms of their scale or function.

All other local community receptors have been classified with a residual 'moderate-slight' or 'slight' visual impact significance, which reflects the high degree of screening in the surrounding landscape in the form of terrain screening and layers of mature intervening vegetation.

In summary, the proposed turbines will present with a dominant visual presence from some of the nearest surrounding local community receptors and will be one of the defining built features along the elevated lands surrounding the site. Notwithstanding, the dispersed nature of the two distinct arrays limits the overall perceived scale of the development as the surrounding terrain and intervening vegetation reduce the potential for clear views of both parcels of the turbine array to be viewed in combination from some parts of the central study area. Furthermore, the proposed turbines are located across a broad elevated ridge characterised by extensive areas of conifer forestry, which will help to assimilate the overall scale of the turbines into this landscape context. As a result of the reasons outlined above, it is not considered that the Proposed Development will generate significant visual impacts for local community receptors.

14.8.3.5 Impact on Tourism, Amenity and Heritage Features

Ten viewpoints were selected to represent tourism, amenity and heritage features within the central and wider study area (Viewpoints VP2, VP5, VP6, VP7, VP8, VP10, VP14, VP23, VP25 & VP26). The study area has some noticeable heritage associations and landscape values, albeit the more prominent of these are located in its wider surrounds. Indeed, there is also some notable landscape values within the study area related to recreation, which are associated with waymarked walking trails, local walks and rivers and lakes.

In terms of the immediate site context, a section of the East Clare Way passes directly through the site and will afford clear views of the turbines, which will present with a dominant visual presence. Nonetheless, this elevated landscape context is cloaked in extensive areas of active conifer forestry and is not considered highly rare or unique in any sense. There will be some broad distant views afforded from this linear walking trail where the Proposed Development will be clearly and prominently visible and has the potential to slightly detract from the scenic amenity afforded here. Notwithstanding, the turbines are slender structures and will not block or heavily obstruct the views afforded of the surrounding countryside. Indeed, numerous waymarked walking trails pass immediately adjacent to wind farm developments throughout the country. Furthermore, with reference to the permitted Boggeragh II Wind Farm (Planning Ref: 10/08067), which is located in an almost identical elevated context that is heavily influenced by existing forestry and is intersected by a waymarked walking trail, the Inspectors Report stated;

“The proposed development will involve the introduction of large structures into the landscape at a relatively near distance along part of the route. However, in the context of the assessment in relation to visual amenity and landscape above, I do not consider that the impact of the proposed development would significantly affect the recreational value of the walking route. I have no objection to the proposed development in this respect.”

Other notable aspects of amenity within the central study area include Doon Lough, popular among local bathers during the summer months, which encompasses a picnic area and a forest walk. Whilst the ZTV identifies the potential for visibility from this sensitive receptor, Doon Lough is heavily contained by mature woodland, whilst the woodland walks are also afforded a high degree of containment and will afford no clear visibility of the site.



Figure 14.9 Views from the picnic and area local bathers use (Proposed development is located to the left of frame and is heavily screened by mature vegetation).

Aside from the receptors mentioned above, most of the remaining tourism, amenity and heritage receptors within the study area relate to local churches and graveyards. Some elevated graveyards are located in the northwest quadrant of the study area and include Clonlea Cemetery and Kilmurry Graveyard. Both of these heritage receptors are also representative views of their adjacent village settlements and afford pleasant views of the surrounding rural countryside, which is backdropped by the elevated lands that contain the site. Both receptors will afford visibility of the turbines, which present along the distant skyline ridge, some of which are only partially visible. Both receptors were classified with a residual significance of impact of 'Slight'.

The wider study area has a much broader array of tourism, amenity and heritage receptors. Some of the most notable of these relate to prominent heritage features that are notable tourist attractions for domestic and international tourists. Bunratty Castle and Folk Park is located in the heritage settlement of Bunratty, some 10km southwest of the development. A representative view from an adjacent river overbridge depicted the potential visibility of the Proposed Development from this sensitive receptor. Whilst views of the turbines will be afforded from here, they present as distant background features and will have little notable effect on the visual setting of the Castle and views afforded from it. Indeed, the Castle and the settlement of Bunratty are immediately adjacent to a busy major route corridor, which has the most notable influence on the surrounding landscape. Thus, the residual significance of impact was deemed 'Slight-imperceptible'. In similar circumstances, King Johns Castle, located in the centre of Limerick City on the banks of the Shannon, is some c. 11km south of the site. Whilst the wireframe identifies the potential for several turbine blade tips to be afforded from this considerable distance, they are unlikely to be discerned from here and will have no notable impact on the visual amenity of this busy urban context. Thus, the significance of visual impact is deemed Imperceptible.

The wider study area also encompasses numerous other tourism, amenity and heritage receptors, which have the potential to afford visibility of the Proposed Development. Nonetheless, where views are afforded of the turbines, they will typically present as distant background features and will have no notable effect on the visual setting of these receptors, nor will they contribute to any strong detractor in the visual amenity afforded from these locations.

As a result of the reasons outlined above, it is not considered that the Proposed Development will result in significant visual impacts in respect of tourism, heritage and amenity features within the Study Area.

14.8.3.6 Impacts on Designated Views

Several designated scenic routes are located throughout the study area, with some of these situated in the central study area. They are represented by five viewshed reference points (viewpoints VP1, VP3, VP4, VP22, VP23). The nearest of these include a scenic route comprising two sections that traverses the R466 regional road to the north and south of the settlement of Broadford and two scenic routes that travel elevated terrain in the southwest quadrant of the central study area.

The R466 regional road scenic route comprises two sections: one to the east of the site and one to the north of the site. The ZTV identified limited potential for visibility along the section of this route to the east of the site, and further fieldwork investigation found this section of the scenic route to be heavily contained by dense roadside vegetation. Thus, it is not considered that the limited visibility of the turbines, if any, will notably detract from the scenic amenity afforded along this section of the route. The northern section of this route is also afforded a high degree of containment along its nearest sections to the north of the site, where the ZTV also identifies the potential for limited turbine visibility. Nonetheless, as the terrain rises along the northern section of this route, it offers the potential for clearer views of the development. Viewpoint VP7 was selected as a representative view for this section of the scenic route and affords intermittent visibility of the proposed turbines from a distance of over c.5km. The turbines will be viewed as modest-scale background features and will have a minimal impact on the visual amenity afforded from this section of the scenic route. Overall, the significance of visual impact was deemed Slight.

Two other scenic route designations also run northeast by southwest along elevated terrain northeast of the settlement of Cratloe. Due to the elevated nature of the terrain here, broad intermittent views will be afforded across the landscape, albeit the main aspect of amenity relates to views to the northwest and west. In contrast, the Proposed Development is viewed on elevated lands to the northeast. Furthermore, the more southern scenic route only has the potential for intermitted views of the development as large sections of its route are located outside of ZTV, whilst the road corridor is also heavily contained by surrounding conifer forest plantations. Viewpoint VP23 was selected as a representative view from these scenic routes and represents a scenic viewpoint at Woodcock Hill Bog. The turbines will be visible from here at a noticeable scale, albeit partially screened by the nearby conifer forest plantations. They will generate a notable increase in the intensity of development here, however, it is important to note that this elevated location is already strongly influenced by radar equipment and telecommunication masts located around the summit of Woodcock Hill.

Furthermore, the turbines do not block any highly sensitive aspects in this view and present well offset from the more visually susceptible Slieve Bearnagh uplands located further in the distance to the northeast. Thus, whilst the proposed turbines have the potential to be viewed from these scenic routes and will increase the perceived intensity of built development in the surrounding landscape, they will not block or obstruct the views afforded and are typically viewed offset from the main aspects of visual amenity. Thus, the residual significance of visual impact was deemed Moderate-slight.

The Proposed Development will also be partially visible from other scenic routes in the wider study area. The turbines will typically present as distant background features and will only result in a minimal reduction in the degree of scenic amenity afforded from these routes. From some of the more distant scenic designations within the study area, the proposed turbines will likely be very difficult to discern and will have a residual visual impact in the range of slight-imperceptible to imperceptible.

As a result of the reasons outlined above, it is not considered that the Proposed Development will result in significant visual impacts in respect of scenic designations within the Study Area.

14.8.3.7 Impacts on Centres of Population

Centres of population are represented by over thirteen representative viewpoints within the study area (VP1, VP2, VP3, VP5, VP6, VP7, VP10, VP14, VP18, VP20, VP24, VP25 & VP26), which highlights the modified and settled nature of this landscape context. It is important to note that many of these views also represent tourism, heritage and amenity receptors, local community views and scenic designations and have been summarised in the above sections.

The nearest centre of population to the Proposed Development is the quaint village of Broadford, which is situated along the valley of the Broadford River at the foothills of the Slieve Bearnagh Mountains. The village is the nearest notable settlement of the Proposed Development and is located some c. 1.5km north of the eastern turbine array at its nearest point. Viewpoint VP7 was selected as a representative view from the settlement and is located on locally elevated lands at St. Peter's Church, where views are afforded across the town and towards the neighbouring rolling hills and ridges. Whilst the Proposed Development will be clearly visible here, only the four easternmost turbines in the array will be visible, albeit at a prominent scale along the summit of the ridge that backdrops the settlement. Although the turbines will be prominent built features when viewed from this settlement and its surrounding area, they do not appear over-scaled or inappropriate along the broad elevated ridge. Thus, the residual significance of visual impact was deemed Moderate.

The settlement of Sixmilebridge is located on the periphery of the central study area, just over 5km from the site. In contrast to the settlement of Broadford mentioned above, only the turbines in the western aspect of the turbine array will be visible at Sixmilebridge. Viewpoint 20 is located at Sixmilebridge GAA ground and depicts the potential visibility afforded of the development from this aspect of the study area. All seven of the turbines in the western extent of the array will be visible from here and present at a modest but noticeable scale. The turbines are viewed here in a legible manner with several instances of turbine overlap, which will generate a slight sense of visual clutter in the view. The residual significance of visual impact was deemed Slight at this viewpoint. It is important

to note that visibility of the turbines from the central areas of Sixmilebridge will likely be much more limited than depicted in the representative viewpoint, as the surrounding built development will result in a more notable degree of containment.

The study area also comprises numerous other settlements, some of which are elevated, others heavily contained by dense vegetation. Indeed, many settlements in the surrounding study area will afford some visibility of the turbines. However, they will likely be viewed as a distant feature and will not appear out of place along the broad forestry-cloaked ridge of the background context.

As a result of the reasons outlined above, it is not considered that the Proposed Development will result in significant visual impacts with respect of centres of population within the Study Area.

14.8.3.8 Impacts on Major Routes

The central and wider study area consists of numerous major linear transport routes ranging from motorways, national routes and regional roads. Major routes within the study area are represented by seven viewshed reference points, including viewpoints VP3, VP4, VP17, VP18, VP22, VP24 and VP25. As noted in previous sections, the nearest major route to the Proposed Development is located less than c. 700m south of the site. Some of the nearest sections of this route to the site are provided with a high degree of containment in the form of roadside hedgerow vegetation. Nevertheless, several sections of this route afford open views of the site from a near distance, the nearest of which are represented by VP17. This viewpoint was also selected to represent local community receptors and is classified with a residual 'Substantial-moderate' visual impact as the proposed turbines will be one of the more prominent built features along this section of the route.

It is important to note that several of the nearest sections of the R466 regional road and R465 regional road, both of which occur in the eastern extent of the central study area, are afforded a high degree of screening by a combination of intervening vegetation screening and surrounding rolling terrain. Thus, there are limited opportunities for clear visibility of the turbines from these sections of the regional road corridors.

Other notable major routes include several motorway corridors and national road corridors, which are generally contained to the wider southern and western extents of the study area. Where views of the development are afforded from these routes, it will typically be perceived as a distant background feature and will result in no notable detractor to the viewers' journey along these routes, especially along sections that are already heavily influenced by urban development, such as those routes in the surrounds of Limerick City.

As a result of the reasons outlined above, it is not considered that the Proposed Development will result in significant visual impacts with respect of major routes within the Study Area.

14.8.3.9 Visual impacts from ancillary elements of the development

The Proposed Development will also result in areas of visual change relating to the proposed on-site substation, the turbine delivery route, the grid connection route and off-site grid connection loop in infrastructure. With regard to the onsite substation, it has the

potential to be viewed from some local community receptors, albeit much of the lower-lying features will be heavily screened by the surrounding networks of mature hedgerow vegetation. In similar circumstances to this, the on-site grid connection loop in infrastructure will also result in an increase in the intensity of development in its local landscape context. Whilst the on-site substation will likely be viewed as a distinct element of the wind farm due to its near distance to the turbines, the proposed off-site grid connection loop in infrastructure is well offset from the main turbine array. Thus, it has the potential to be viewed as a distinctly separate development. Both the onsite substation and off-site grid connection loop in infrastructure will likely result in a degree of visual clutter in their local landscape context due to the nature of their development, which typically comprises numerous electrical infrastructure elements such as pylon structures and lightning masts. Nonetheless, it is not considered that either of these aspects of the development will generate significant visual impacts.

As a result of the reasons outlined above, it is not considered that ancillary elements of the Proposed Development will generate significant visual impacts.

14.8.3.10 *Summary of Visual Impacts*

Based on the visual impact assessments outlined in the sections above and in **Appendix 14.4**, the residual significance of visual impacts ranges between 'Substantial-moderate' to 'Imperceptible'. Indeed, the highest visual effects will occur within the immediate surroundings of the site, but most notably at local community receptors located along the sloping lands to the south of the site. Residential receptors to the north are afforded a more substantial degree of intervening screening in the form of the elevated ridge the site is contained along, combined with the dense conifer forest plantations that cloak the surrounding hillsides. Notwithstanding, even where the Proposed Development is viewed at a near distance, the turbines generally appear in a clear and comprehensible manner, whilst the overall scale and extent of the development tends to be slightly diminished as a result of the dispersed nature of the turbine array. Furthermore, the site and surrounding study area comprise broad landforms and land uses, which can well accommodate a development of this scale and nature, which is further reflected in the 'strategic' wind energy classification that overlays the site.

In summary, it is considered that this eleven-turbine development is appropriately sited in this elevated landscape context that is heavily influenced by existing conifer forest plantations, overhead electrical infrastructure development and more typical rural land uses. The scale of the turbines is well assimilated in this landscape context, and the turbines do not present with any strong sense of overbearing at even the nearest local receptors. Thus, it is not considered that the Proposed Development will result in significant visual impacts.

14.8.4 **Turbine Envelope Consideration**

For the landscape and visual assessment, the pertinent aspect of the design envelope relates to the turbine dimensions used to prepare the photomontages, upon which, the visual impact assessment is based.

In all previous wind energy projects, Macro Works have taken the approach of using the highest possible tip height and hub height combination. This is on the basis that a viewer who can see a hub rising above a skyline ridge is likely to feel they are seeing more of

the turbine than when the hub is screened from view (i.e. in the case of a lower hub / longer blade combination). That premise is based on the hub being perceived as the key and central component of a turbine in a figurative sense. In this instance, the photomontages were prepared using a turbine envelope of 150m rotor diameter, 105m hub height and 180m tip height which represents the maximum potential turbine envelope for the Proposed Development.

An alternative set of turbine dimensions is also being considered by the developer to achieve a turbine tip height in the range of 176.5m – 180m. The comparative scenarios and range of turbine types considered are included below:

- Base-case Scenario – 105m Hub Height, 150m Rotor Diameter, 180m Tip Height (used and assessed in the LVIA)
- Alternative Scenario 1 – 105m Hub Height, 149m Rotor Diameter, 179.5m Tip Height
- Alternative Scenario 2 – 110m Hub Height, 133m Rotor Diameter, 176.5m Tip Height

With regard to variation in tip height (+/- 3.5m), it is not considered that this subtle difference in turbine tip heights will be discernible from even the nearest visual receptors. Furthermore, the turbine scenarios have a 5m variation in hub heights, which will also result in no notable difference in the perceived scale of the proposed turbines. It is considered, based on Macro Works experience of 50+ wind farm development LVIAs, that due to the very subtle variation in the turbine dimensions, it is not deemed necessary to prepare separate photomontages/assessments at all viewpoints for all possible turbine dimensions highlighted above.

Regardless of whether the difference between the alternative turbine dimensions can be discerned or not, there will be no material difference in the level of visual impact between them, and certainly not a higher impact than the base-case outlined in the visual impact appraisal highlighted above. Thus, the submitted LVIA is deemed to comfortably cover the full range of potential visual effects generated by the Proposed Development.

14.9 Monitoring

There are no monitoring measures relevant to landscape and visual.

14.10 Cumulative Effects

The NatureScot Guidance relating to 'Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments (2021) identify that cumulative effects on visual amenity consist of combined visibility and sequential effects. The same categories have also been subsequently adopted in the Landscape Institute's 2013 revision of the Landscape and Visual Impact Assessment Guidelines. The principal focus of wind energy cumulative impact assessment guidance relates to other wind farms - as opposed to other forms of development. This will also be the main focus herein, albeit with a subsequent consideration of cumulative effects with other forms of notable development (existing or permitted), particularly within the Central Study Area.

‘Combined visibility occurs where the observer is able to see two or more developments from one viewpoint. Combined visibility may either be in combination (where several wind farms are within the observer’s arc of vision at the same time) or in succession (where the observer has to turn to see the various wind farms).

Sequential effects occur when the observer has to move to another viewpoint to see different developments. The occurrence of sequential effects may range from frequently sequential (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to occasionally sequential (long time lapses between appearances, because the observer is moving very slowly and / or there are large distances between the viewpoints.)’

Cumulative effects of wind farms tend to be adverse rather than positive as they relate to the addition of moving manmade structures into a landscape and viewing context that already contains such development. Based on guidance contained within the SNH Guidelines relating to the Cumulative Effects of Wind Farms (2012) and the DoEHLG Wind Energy Guidelines (2006/2019 draft), cumulative effects can be experienced in a variety of ways. In terms of landscape character, additional wind energy developments might contribute to an increasing sense of proliferation. A new wind farm might also contribute to a sense of being surrounded by turbines with little relief from the view of them.

In terms of visual amenity, there is a range of ways in which an additional wind farm might generate visual conflict and disharmony in relation to other wind energy developments. Some of the most common include visual tension caused by disparate extent, scale or layout of neighbouring developments. A sense of visual ambivalence might also be caused by adjacent developments traversing different landscape types. Turbines from a proposed development that are seen stacked in perspective against the turbines of nearer or further developments tend to cause visual clutter and confusion. Such effects are exacerbated when, for example, the more distant turbines are larger than the nearer ones and the sense of distance is distorted.

Table 14.9 below provides Macro Works’ criteria for assessing the magnitude of cumulative effects, which are based on the SNH Guidelines (2012).

Table 14.9 Magnitude of Cumulative Impact

Magnitude of Impact	Description
Very High	<p>The proposed wind farm will strongly contribute to wind energy development being the defining element of the surrounding landscape. It will strongly contribute to a sense of wind farm proliferation and being surrounded by wind energy development.</p> <p>Strongly adverse visual effects will be generated by the proposed turbines in relation to other turbines.</p>
High	<p>The proposed wind farm will contribute significantly to wind energy development being a defining element of the surrounding landscape. It will significantly contribute to a sense of wind farm proliferation and being surrounded by wind energy development.</p> <p>Significant adverse visual effects will be generated by the proposed turbines in relation to other turbines.</p>

Magnitude of Impact	Description
Medium	<p>The proposed wind farm will contribute to wind energy development being a characteristic element of the surrounding landscape.</p> <p>It will contribute to a sense of wind farm accumulation and dissemination within the surrounding landscape.</p> <p>Adverse visual effects might be generated by the proposed turbines in relation to other turbines.</p>
Low	<p>The proposed wind farm will be one of only a few wind farms in the surrounding area and will be viewed in isolation from most receptors.</p> <p>It might contribute to wind farm development becoming a familiar feature within the surrounding landscape.</p> <p>The design characteristics of the proposed wind farm accord with other schemes within the surrounding landscape and adverse visual effects are not likely to occur in relation to these.</p>
Negligible	<p>The proposed wind farm will most often be viewed in isolation or occasionally in conjunction with other distant wind energy developments.</p> <p>Wind energy development will remain an uncommon landscape feature in the surrounding landscape.</p> <p>No adverse visual effects will be generated by the proposed turbines in relation to other turbines.</p>

14.10.1.1 Cumulative Impact Assessment

There are 2 single turbine developments and 1 consented wind farm, 1 proposed wind farm (under appeal) and 3 wind farms at pre-planning stage contained within the study area. These are set out in the table below.

Table 14.10 Cumulative Wind Farms within the study area

Wind Farm Name	Number of turbines	Distance and Direction from proposed turbine to the nearest cumulative turbine	Status
Knockshanvo Wind Farm	9	Immediately adjacent	Pre-planning
Ballycar Wind Farm	c. 12	c. 3km south	Pre-planning
Carrownagowan Wind Farm	19	c. 4km north	Consented
Lackareagh Wind Farm	c. 6	c.5.5km east	Pre-planning
Fahy Beg Wind Farm	8	c. 5.8km east	Refused
Parteen Single Turbine	1	c.9km southeast	Existing

Wind Farm Name	Number of turbines	Distance and Direction from proposed turbine to the nearest cumulative turbine	Status
Vision Care Single Turbine	1	c.14km southeast	Existing

The appraisal of cumulative effects with other wind energy developments is based on the cumulative ZTV maps and wireframes provided in **Appendix 14.5** and in **EIAR Volume IV Photomontages**, respectively. A further discussion on potential cumulative effects is included in section 14.10.1.2 below.

14.10.1.2 Nature of Cumulative Visibility

The nature of cumulative visibility within the study area is analysed in the sections below, and in this instance, the cumulative assessment has been divided into the existing baseline scenario and the potential future baseline scenario. The existing baseline scenario relates to all existing and consented developments within the study area. It does not include any developments that are proposed, under appeal or at the pre-planning stage. The potential future baseline scenario includes all existing, consented and proposed developments and developments at the pre-planning stage that have publicly accessible information.

Existing Baseline Scenario

Although the analysis of the Cumulative ZTV map in **Appendix 14.5** relates principally to cumulative visual effects (i.e. utilising the selected VP set), it also informs the closely related assessment of cumulative landscape effects, particularly those relating to cumulative effects on the overall landscape character of the study area. The assessment below, therefore, relates to both cumulative visual effects and cumulative landscape effects.

The cumulative ZTV map shows the potential for cumulative visibility between the proposed turbines and all other existing wind farm developments within the 20km study area. At present, there are two operational single turbines located in the wider southern half of the study area, whilst a consented 19 turbine development is located in the Slieve Bearnagh Mountains some c. 4km north of the site. It is important to note that the cumulative ZTVs are based on bare-ground data. Thus, cumulative wind farm visibility is likely to be much less than identified on the ZTV maps due to the high degree of intervening vegetation throughout the study area. As per the cumulative ZTV (**Figure 14.10** refers), the Proposed Development only has the potential to be viewed in isolation for 11.2% of the study area. The most notable of these areas occurs to the immediate southwest of the Proposed Development, where the terrain that contains the site will screen the Carrownagowan turbines, whilst the elevated lands to the south of the site will screen the single turbine developments north of Limerick City. There are also some localised areas where isolated views of the Proposed Development have the potential to be afforded at the settlement of Broadford and in the wider eastern periphery of the study area in the surrounds of Birdhill.

Over 58% of the study area has the potential to afford views of the Proposed Development in combination with other existing and consented developments. Indeed, much of the cumulative visibility will likely relate to the combined visibility of the Proposed Development and the consented Carrownagowan development, as this consented development comprises over 19 turbines and is located within the elevated Slieve Bearnagh Uplands. Nevertheless, there is a clear separation between all the existing, consented and the Proposed Development, which limits the potential for the development to generate and strong negative cumulative aesthetic effects such as stack views of turbines and turbine blade sets overlapping. Each of the existing and consented developments is clearly defined by the landforms and land uses they are associated with, with the Carrownagowan development situated within the elevated uplands, whilst the two single turbine developments are located within their relevant industrial/commercial land uses. With respect of the two single turbine development, there is very limited potential for these to contribute to any notable cumulative effects. It is important to note that 14.6% of the study area has no potential to afford views of existing, consented or proposed development.

In terms of sequential views, several waymarked walking trails, scenic routes and major transport routes occur throughout the central and wider study area. Those most likely to be affected by sequential effects include the East Clare Way and the scenic route that traverses the R465 regional road north and south of Broadford. Due to the elevated nature of the East Clare Way, which traverse immediately adjacent to both the consented Carrownagowan Wind Farm and the Proposed Development, there is some notable potential for sequential effects to occur. Notwithstanding, both consented and proposed developments are afforded clear separation distances of over c.4km, and whilst they will contribute to a notable intensification of development along their routes, they will not significantly detract from the recreational amenity afforded along the East Clare Way. There is also some potential for sequential cumulative visual impacts to occur along the R465 regional road scenic route located north of Broadford. The cumulative ZTV identifies the potential for visibility of both developments from sections of this route. However, they will be viewed as distinctly separate developments, whilst the high degree of existing vegetation located along this regional road, which limit the potential for and clear views of the combined developments to be afforded.

As a result of the reasons outlined above, the magnitude of cumulative effect in relation to wind farms within the 20km Study Area is deemed Medium-Low.

In respect of cumulative effects with other forms of development, there are no other large scale developments within the vicinity of the site.

The only other notable land use in relation to the proposed wind farm is forestry, a key component of which is harvesting, which has the potential to result in clearer views of the proposed turbines and the surrounding site access tracks. Nonetheless, it is not expected that the underlying sloping lands will ever be harvested entirely. Instead, they will be harvested in sections, which will subsequently be replanted once harvesting activities have concluded. It is not considered that the more exposed views of turbines as a result of potential harvesting activities will result in significant cumulative landscape or visual effects.

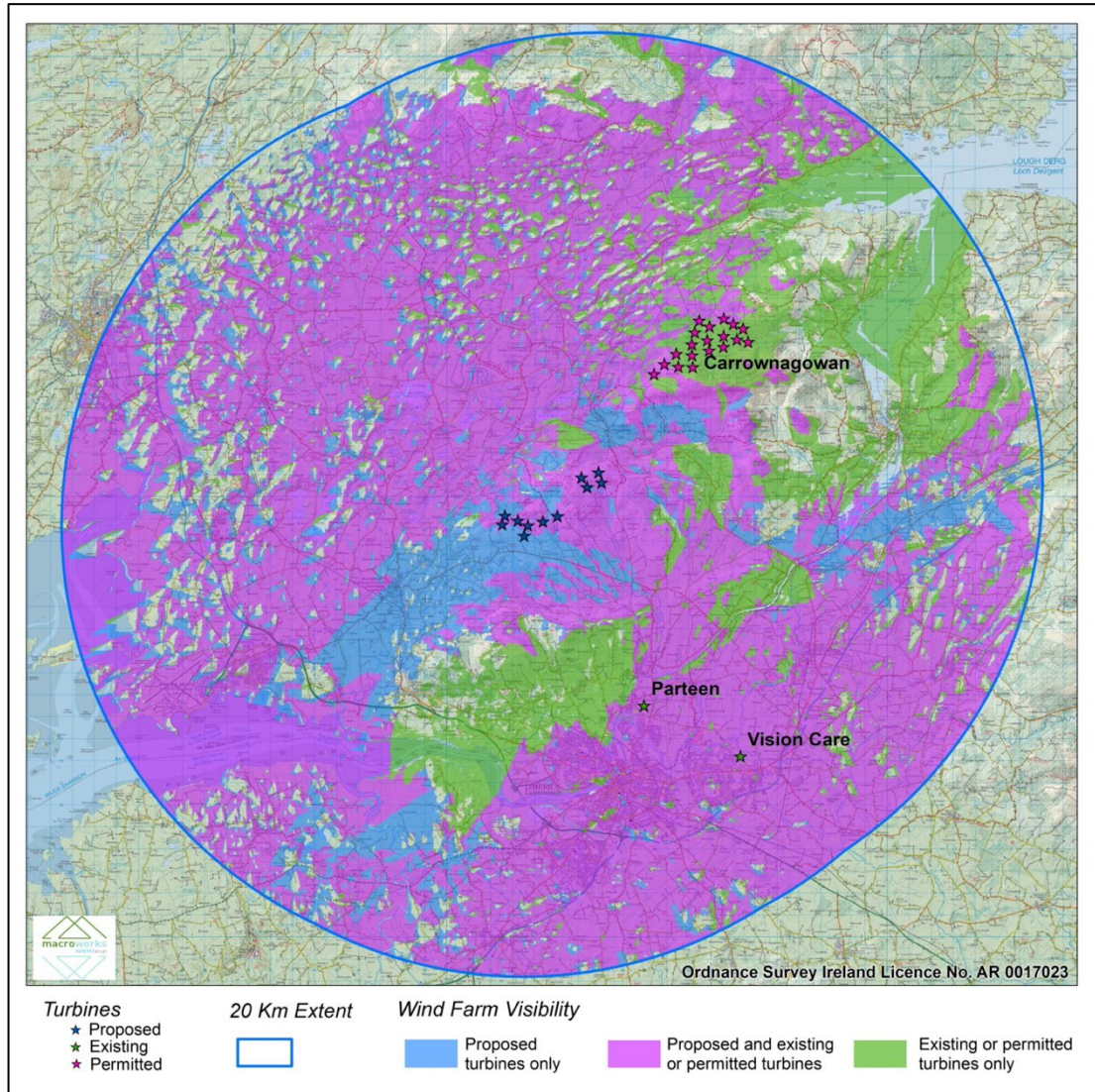


Figure 14.10 Cumulative ZTV Map - Tip Height (180m) –identifying the potential intervisibility of the Proposed Development and all other existing and consented wind farms within the study area (See Appendix 14.5 for larger version)

Potential Future Baseline Scenario

The potential future baseline scenario relates to all existing, consented, proposed and developments at the pre-planning stage. In this instance, Knockshanvo Wind Farm is located immediately adjacent to the Proposed Development and is at the pre-planning stage, Ballycar Wind Farm (pre-planning) is proposed to be located some 3km south of the site, whilst the proposed Fahy Beg Wind Farm development (refused - under appeal to ABP) is located some c. 5.8km east of the site. As per the cumulative ZTV for the potential future baseline scenario (**Figure 14.11** refers), one of the most notable differences is the clear reduction in the potential for isolated views of the Proposed Development to be afforded. In the potential future baseline scenario, visibility of the Proposed Development in isolation only has the potential to occur within 0.6% of the study area. This relates to a small area to the west of the site and is principally associated

with the Knockshanvo development, which is situated immediately adjacent to the Proposed Development.

The Proposed Development and proposed Knockshanvo developments are likely to be perceived as one larger scale development situated across the underlying elevated hills west of the settlement of Broadford. Whilst the combined developments will result in a marked intensity of development in the local landscape and on the surrounding hillsides, the addition of the proposed Knockshanvo development will fill the existing gaps between the western and eastern aspects of the Proposed Development turbine array and will likely present as one consolidated wind farm development along the broad ridge. The turbines in both proposed developments will also be of a similar scale, which reduces the potential for any sense of scale conflict to occur and results in a more comprehensible combined view of the two developments. Nevertheless, the combination of both proposed developments will result in wind farm development becoming one of the more characteristic features in this elevated landscape context.

The proposed Ballycar development is also located along sloping lands facing north towards the Proposed Development and will often be viewed in combination with the Proposed Development, especially from receptors located within the valley between the proposed site and Woodcock Hill. Whilst the surrounding mature hedgerow vegetation and areas of conifer forest will provide a notable degree of screening for local community receptors, there is potential to local dwellings to afford views of turbines both to the north and south, which will generate some perception that they are contained within a wind farm. Notwithstanding, both developments are located along elevated lands that comprise of lower population densities and are offset from the more populated areas such as the R471.

The proposed Fahy Beg and Lackareagh Wind Farms are situated to the east of the site and are afforded a clear degree of separation from the Proposed Development. They are located along the Slieve Bearnagh foothills, some 5.5km east of the site. Nonetheless, there will still be some clear opportunities to afford combined views of the Proposed Development and the proposed Fahy Beg and Lackareagh developments. They will contribute to a notable increase in the intensity of wind farm development in this aspect of the study area, albeit they will present as distinctly separate developments to the Proposed Development turbines.

In terms of the sequential cumulative effects identified in the existing baseline scenario outlined above, there will be a notable increase in the intensity of these effects in the potential future baseline scenario. Nevertheless, as the proposed Knockshanvo development is located adjacent to the Proposed Development, the effects are not considered to further disperse notably across the study area. Instead, they remain localised to the elevated uplands that contain the Proposed Development.

Overall, it is considered that there will be a notable sense of wind farm proliferation within the central study area and in the wider eastern half of the study area. Wind farm development will become one of the more prominent built developments within the surrounding landscape, albeit these perceptual effects are slightly diminished as a result of the siting of the Knockshanvo development immediately adjacent to the Proposed Development. This results in the combined development being perceived as one larger consolidated array of turbines. Overall, should all of the proposed developments within the study area be permitted and constructed, it is considered that the Proposed

Development will contribute to a cumulative effect in the order of High-medium in the potential future baseline scenario.

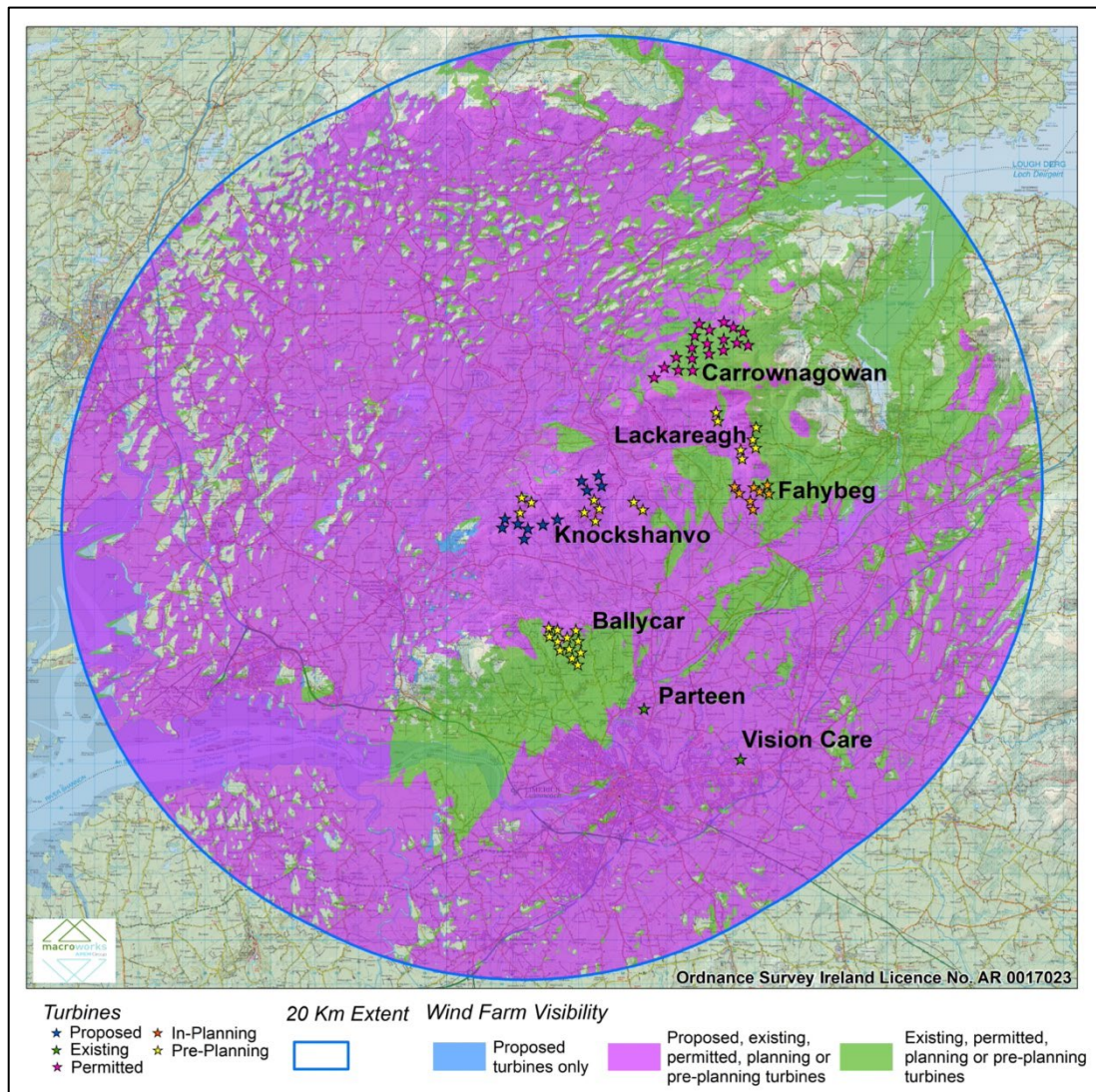


Figure 14.11 Cumulative ZTV Map - Tip Height (180m) –identifying the potential intervisibility of the Proposed Development and all other existing, consented, proposed and pre-planning stage wind farm developments within the study area (See Appendix 14.5 for larger version).

14.11 References

European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU);

Environmental Protection Agency (EPA) publication '*Guidelines on the Information to be contained in Environmental Impact Statements* (2022)

Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled *Guidelines for Landscape and Visual Impact Assessment – Third Addition* (2013).

NatureScot (2021) *Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments*. [online]

Department of the Environment, Heritage and Local Government *Wind Energy Development Guidelines* (2006 and 2019 draft).

NatureScot *Visual representation of wind farms: Best Practice Guidelines* (version 2.2 - 2017).