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CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED FAHY BEG WIND FARM, CO. CLARE

VOLUME 2 - MAIN EIAR

CHAPTER 15 – LANDSCAPE AND VISUAL IMPACT ASSESSMENT

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15 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

15.1 Introduction

This chapter describes the landscape context of the proposed Fahy Beg Wind Farm 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.

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

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (Draft 2015).
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (GLVIA)– Third Addition (2013).
- Scottish Natural Heritage (SNH) Guidance Note: Cumulative Effect of Wind Farms (2012).
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006 / Draft Revised 2019).
- Scottish Natural Heritage (SNH) Visual representation of wind farms: Best Practice Guidelines (version 2.2 - 2017).

15.1.1 Statement of Authority

This Landscape and Visual Assessment (LVIA) report was prepared by Principal Landscape Architect, Richard Barker (MILI, MLA, PGDip Forestry, BA Env), of Macro Works Ltd. Macro Works Ltd, is a specialist LVIA company with over 20 years of experience in the appraisal of effects from a variety of energy, infrastructure and commercial developments.

Relevant experience includes LVIA work on over 140 on-shore wind farm proposals throughout Ireland, including 15+ Strategic Infrastructure Development (SID) wind farms. Macro Works and Richard Barker are affiliated with the Irish Landscape Institute.

15.1.2 Description of the Proposed Development

A detailed description of the proposed project assessed in the EIAR is contained in Chapter 3.

The key elements of the proposed project are:

- The wind farm site **(referred to in this EIAR as** 'the Site');
- The grid connection (**referred to in this EIAR** as the 'GCR');
- The turbine delivery route **(referred to in this EIAR as** the 'TDR');

The Site includes the wind turbines, internal access tracks, hard standings, permanent meteorological mast, onsite substation, internal electrical and communications cabling, temporary construction compound, drainage infrastructure and all associated works related to the construction of the wind farm.

It is proposed to construct 8 no. turbines with a blade tip height range from 169 m to 176.5 m, a hub height range from 102.5 m to 110 m and a rotor diameter range from 131 m to 138 m;

In the context of the landscape and visual assessment, a specimen turbine that incorporates the highest potential blade tip height (176.5m) and largest potential rotor diameter (138m) will be used for the preparation of ZTV maps and Photomontages to aid the overall assessment. Thereafter, the potential range of turbine dimensions will be assessed using comparative photomontages of the specimen dimensions against the lowest hub height and largest rotor dimeter combination (102.5m / 138m) and then highest hub height and smallest rotor dimeter combination (110m / 131m). Comparative photomontages are prepared for three sample views selected from the main viewpoint set. This process ensures that the full range of potential turbine component dimensions is thoroughly assessed and has been used in a number of previous applications where it was considered to be a reasonable approach by the relevant Planning Authorities.

While it is proposed to apply for the above-mentioned limited range of turbine dimensions, if the Council is of a mind to permit the development based on fixed dimensions only for the turbines, the following five fixed dimensions for turbines are consented:

- Tip height of 171.5m, hub height of 106m, blade length of 65.5m;
- Tip height of 169m, hub height of 102.5m, blade length of 66.5m;
- Tip height of 176.5m hub height of 110m, blade length of 66.5m;
- Tip height of 173m hub height of 105m, blade length of 68m;
- Tip height of 176.5m hub height of 107.5m, blade length of 69m

15.1.3 Definition of the Study Area

Both the current 2006 Wind Energy Development Guidelines and the revised 2019 Guidelines specify different radii for examining the zone of theoretical visibility of proposed wind farm projects (ZTV) based on turbine height. By default the ZTV radius has also been used to define the study area.

The extent of the study area is influenced by turbine height, as follows:

- 15 km radius for blade tips up to 100m;
- 20 km radius for blade tips greater than 100m and;
- 25 km radius where landscapes of national and international importance exist.

In the case of this project, the maximum blade tips are 176.5m high and, thus, the minimum ZTV radius recommended is 20 km from the outermost turbines of the scheme. This will also be the extent of the study area.

Notwithstanding the full 20km extent of the LVIA study area, there will be a particular focus on receptors and effects within the central study area, where there is higher potential for significant impacts to occur. When referenced within this assessment, the 'central study area' is the landscape within approx. 5km of the site.

15.2 Methodology

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, as detailed in the preceding Statement of Authority. This entailed the following:

15.2.1 Desktop Survey

- 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 project is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations;
- Review of study area mapping and on-line sources to identify key settlements and transport routes as well as heritage amenity and tourism locations where visitors are likely to be sensitive to changes in views;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity;

15.2.2 Fieldwork

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

15.2.3 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, facilities and heritage features 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.
- Assessment of the significance of residual landscape impacts.
- Assessment of the significance of residual visual impacts aided by photomontages prepared at all of the selected VRP locations.
- Assessment of cumulative landscape and visual effects in combination with other relevant surrounding developments that are existing, permitted or proposed.

15.2.4 Assessment Criteria for Landscape Impacts

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;
- Significance of landscape effects

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area (LCA) or feature) can accommodate changes or new features without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria outlined in Table 15.1 below:

Table 15-1: 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.

The magnitude of a predicted landscape impact 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 proposal site boundary that may have an effect on the landscape character of the area. Table 15.2 refers:

Table 15-2: Magnitude of Landscape Impacts

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 overall 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 an overall 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 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.
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.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in Table 15.3:

Table 15-3: Landscape Impact Significance Matrix

	Sensitivity of Receptor				
Magnitude	***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' and above are considered to be 'significant impacts' in EIA terms.*

15.2.5 Assessment Criteria for Visual Impacts

As with the landscape impact, the visual impact of the proposed wind farm will be assessed as a function of receptor sensitivity versus magnitude. In this instance, the sensitivity of visual receptors, weighed against the magnitude of visual effects.

15.2.5.1 Visual Sensitivity

Unlike landscape sensitivity, visual sensitivity has an anthropocentric basis. Visual sensitivity is a two-sided analysis of receptor susceptibility (people or groups of people) versus the value of the view on offer at a particular location.

To assess the susceptibility of viewers and the amenity value of views, the assessors use a range of criteria and provide a four point weighting scale to indicate how strongly the viewer/view is associated with each of the criterion. Susceptibility criteria is extracted directly from the aforementioned Guidelines for Landscape and Visual Assessment (2013), whilst the value criteria relate to various aspects of a view that might typically be related to high amenity including, but not limited to, scenic designations. These are set out below:

Susceptibility of receptor group to changes in view. This is one of the most important criteria to consider in determining overall visual sensitivity because it is the single category dealing with viewer susceptibility. In accordance with the IEMA Guidelines for Landscape and Visual Assessment (3rd edition 2013) 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 focused 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; and*
- *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; and*
- *People at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life.*

Values typically associated with views;

- **Recognised scenic value of the view** (County 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, at least, a public consultation process is required;

- **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated with the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- **Intensity of use, popularity**. Whilst not reflective of the amenity value of a view, this criterion relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;
- **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 national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it;
- **Provision of 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**. Remote and tranquil viewing locations are more likely to heighten the amenity value of a view and have a lower intensity of development in comparison to dynamic viewing locations such as 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 obvious human interventions;
- **Presence of striking or noteworthy features**. A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;
- **Historical, cultural or spiritual value**. Such attributes may be evident or sensed at certain viewing locations that 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 other similar views might be afforded in the local or the national context;
- **Integrity of the landscape character in view**. This criterion considers 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 criterion considers whether there is special sense of wholeness and harmony at the viewing location; and
- **Sense of awe**. This criterion considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations where highly susceptible receptors or receptor groups are present and which are deemed to satisfy many of the view value criteria above are likely to be judged to have a high visual sensitivity and vice versa.

15.2.5.2 Visual Impact Magnitude

The magnitude of visual effects is determined on the basis of two factors: the visual presence of the proposal and its effect on visual amenity.

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the proposal is within a particular view. This is based on a number of aspects beyond simply scale in relation to distance. Some of these include the extent of the view as well as its complexity and the degree of existing contextual movement experienced such as might occur where turbines are viewed as part of / beyond a busy street scene. The backdrop against which the project is presented and its relationship with other focal points or prominent features within the view is also considered. Visual presence is essentially a measure of the relative visual dominance of the proposal within the available vista and is expressed as such i.e. 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' (i.e. the blocking of a view). The magnitude of visual impacts is classified in the following table:

Table 15-4: Magnitude of Visual Impact

Criteria	Description
Very High	The proposal obstructs or intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. An extensive degree of visual change will occur within the scene completely altering its character, composition and associated visual amenity
High	The proposal obstructs or intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual change will occur within the scene substantially altering its character, composition and associated visual amenity
Medium	The proposal represents a moderate intrusion into the available vista and is a readily noticeable element. A noticeable degree of visual change will occur within the scene perceptibly altering its character, composition and associated visual amenity

Criteria	Description
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and/or it would not influence the visual amenity of the scene

15.2.6 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix included for Landscape Impact Significance at Table 15.3 above.

15.2.7 Quality and Timescale of Effects

In addition to assessing the significance of landscape effects and visual effects, EPA Guidelines on the information to be contained in Environmental Impact Reports (2022) requires that the quality of the effects is also determined. This could be negative/adverse, neutral, or positive/beneficial. 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.

Landscape and Visual effects are also categorised according to their duration:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years; and
- Permanent – Lasting over sixty years.

15.3 Existing Environment

15.3.1 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.' However, 'centres of population', 'transport routes' and 'tourism, recreation and heritage features' form part of the visual baseline, which is dealt with in Section 15.4 below.

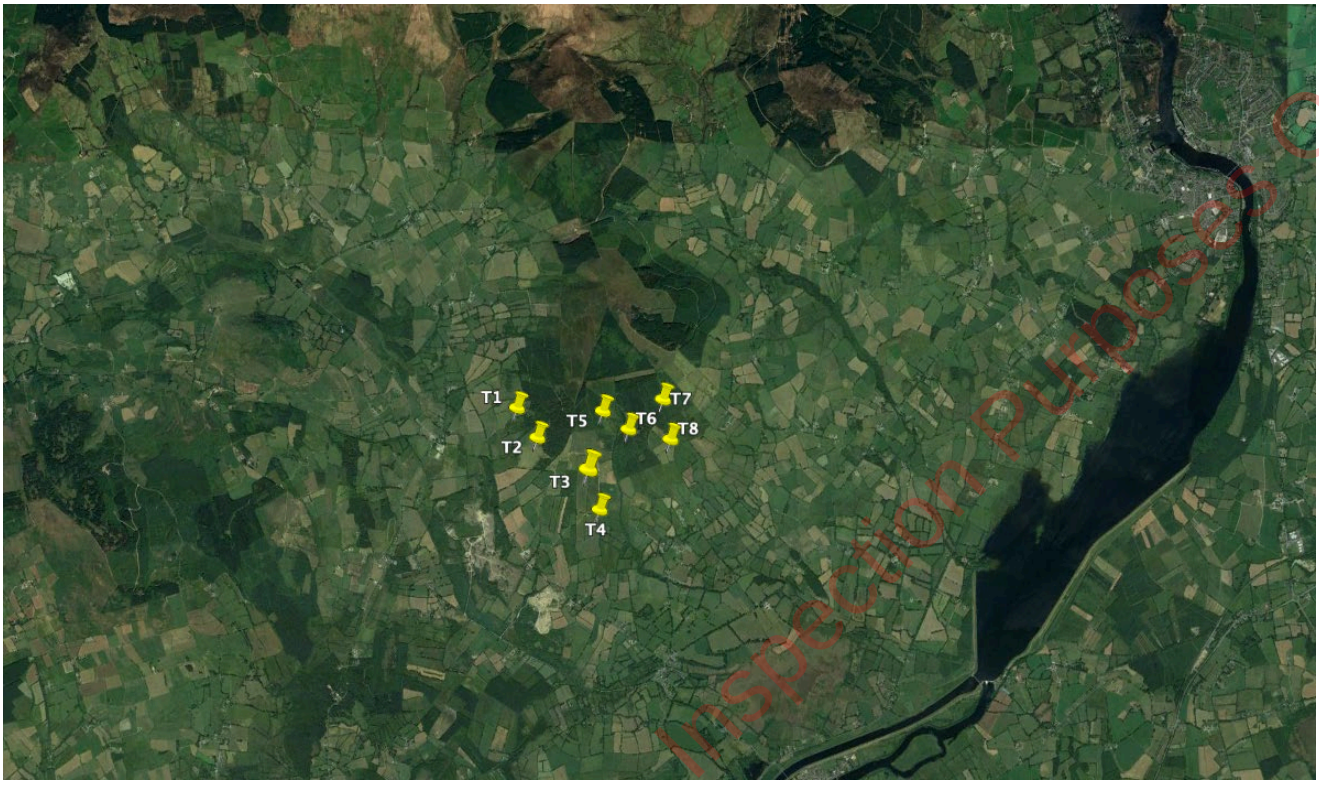

Figure 15-1: Aerial photography showing the Landscape context of the site and its immediate surrounds

15.3.1.1 Landform and Drainage

The study area is highly varied, with both dramatic upland areas and major waterways. The study area is divided in half by the Shannon corridor and the southern half of Lough Derg. There are two mountain ranges through the middle of the study area, with the Slieve Bearnagh Mountains on the west of the river corridor, and the Arra Mountains to the east. There are other, lesser upland areas to the south of the Slieve Bearnagh Mountains, Seefin, and Woodcock Hill. At the periphery of the study area, there is a second set of major upland areas, with the Slieve Aughty Mountains at the north-western edge of the study area, and the Silvermine Mountains, Keepers Hill, and Slieve Felim Mountains to the southeast of the study area. The river corridor and lough is framed by these upland areas and through the central/eastern study area, most waterways are connected to the Shannon. This differs to the wider western half of the study area, where the landform and drainage are a sweeping glacial valley of varied slopes. This valley opens to the west of the study area, into open, rolling landform interspersed with loughs. The nearest of these to the site is Doon Lough and Lough Gar. The major waterway through the west of the study area is the Owenogarney or Ratty River, which forms a chain of loughs around the western hills of Seefin and Woodcock Hill. Both of these areas and waterway networks drain to the south/southwest of the study area where the Shannon opens to the coast, forming a broad estuarine landscape.

The site is located on the southern face of Lackareagh Mountain, the southernmost extension of the Slieve Bearnagh Mountains. These mountains are made up of two main peaks, with Cragnamurragh (526m) and Moylussa (532m) the highest along the main ridge, which runs east/west.

There are a variety of secondary peaks extending to the northeast and southeast in particular. Lackareagh is divided from this main group by a drop in elevation to approximately 250m between Lackareagh (357m) and Glennagalliagh (446m), and a distance of 2km. The Slieve Bearnagh Mountains, in combination with the Arra Mountains contain the southern point of Lough Derg. From the western shore from Scariff Bay southwards, the rolling upland areas form a pinch point where Lough Derg narrows into the Shannon once more, at its nearest, the river is 3.4km east of the site. It is at this point that is also split into the main Shannon Corridor, and a man-made canal to feed the Ardnacrusha Hydro Power Station (10.5km south of the site and the proposed grid connection point). At a point 12km southwest of the site, the canal and the river combine once more before widening into a more estuarine character to the far southwest of the study area.

Figure 15-2: Slieve Bearnaghs from the canal at O'Briens bridge

Figure 15-3: Slieve Bearnaghs and Shannon from the Lough Derg Way over the Arra Mountains

15.3.1.2 Vegetation and Land Use

On the more level and rolling areas, the vegetation and land use are dominated by densely tree-lined agricultural fields. As the landform slopes towards the upland areas, there is a transition through different landcover types. Initially, at the foothills of the upland areas, the fields and hedgerows are interspersed with commercial conifer forestry plantations. Further upslope, there is very little built form, but large tracts of conifers over the lower peaks of the Slieve Bearnagh and Arra Mountains, as well as in the south of the study area where Seefin and Woodcock Hill each feature large areas of conifers. Over the most elevated sections of the upland areas, the conifers are replaced by moorland. Throughout the surrounding valleys and farmland, there are areas of woodland following the periphery of waterways or loughs. In the west of the study area, amongst such woodland and loughs, there are a number of small bogs, generally featuring some degree of harvesting. There are dispersed instances of more intensive land use, such as population centres, power generation and extractive industries. The largest built-up area is to the south of the study area consisting of Limerick City and surrounds.

There is also a cluster of industrial sites and quarries across the centre of the study area, with the nearest located c. 750m to the southwest of the site. As noted above, there is also a considerable influence on the landscape through the introduction of the hydro power canal along the Shannon corridor. This results in a linear area fairly devoid of vegetation and residences, (due to the steep embankments, security measures and wide waterway) however both vegetation and residences border the canal, outside of these barriers.

Figure 15-4: Lackareagh Mountain viewed from the south, showing the transition in landcover and uses.

15.3.2 Landscape Policy Context and Designations

15.3.2.1 Department of Environment, Heritage and Local Government Wind Energy Development Guidelines 2006

The 2006 Wind Energy Development Guidelines provide guidance on wind farm siting and design criteria for a number of different landscape types. The main wind farm site and central study area is considered to be located within a landscape that is consistent with the '*Transitional Marginal Landscapes'* landscape type. However, there are also some aspects of the '*Hilly and Flat Farmland'* landscape type. In such instances, the Guidelines recommend consideration of the advice for each landscape type (advice remains consistent for Draft Revised Guidelines - 2019). Siting and design recommendations for these landscape types include the following:

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."*

"wind energy developments might also be located at lower levels in extensive areas of this landscape type, where they will be perceived against a relatively complex backdrop. In these situations it is important to minimise visual confusion such as the crossing by blade sets of skylines, buildings, utility lines and varied landcover."

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."*

"4(a)Wind energy development with regular spacing and linear layout – may not be appropriate due to the undulation of the land from as well as limited field pattern."

"4(b)Wind energy development with irregular spacing and random layout -is more appropriate given the relative undulation of the setting."

"4(c)Large wind energy development straddling two landscape character types within the same visual unit can create visual ambivalence and, thus, negative tension between the two character types involved."

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."*

"…the profile can be even or uneven, depending on the profile and visual complexity of the terrain involved. The more rugged and undulating, the greater the acceptability of an uneven profile provided it does not result in significant visual confusion and conflict."

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."*

In instances where two or more landscape types are potentially applicable, the Guidelines recommend consideration of the advice for each landscape type rather than just the one that is considered to be most applicable. The 2006 Guidance specifically states (p40):

> *"It is, however, common that a wind energy development is located in one landscape character type but is visible from another, for example, where the site comprises an unenclosed moorland ridge standing above a broad flat farmland. In such an instance, the entire visual unit should be taken into consideration …".*

In combination with the recommendations for *'Transitional Marginal Landscapes',* the siting and design recommendations for the *'Hilly and Flat Farmland'* landscape types have also been considered when designing the turbine layout for the proposed Fahy Beg Wind Farm as a result of the varied nature of the landscape within the central and wider study area. In general, the proposed development is relatively consistent with the guidance notes for both landscape types, but it is especially consistent with the guidance for the landscape type '*Transitional Marginal Landscapes'* in which the proposed project is situated. A key consideration in this instance was the locational guidance which states "*wind energy developments may be located at lower levels in extensive areas of this landscape type, where they will be perceived against a relatively complex backdrop."*

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 Specific Planning Policy Requirement 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.*

A minimum setback distance of 706m is required for this project. All of the nearest occupied dwellings fall outside this distance with the nearest one being 708m. Further to this the proposed layout sought to achieve an optimum separation distance between dwellings and the proposed turbines by providing a minimum separation distance of 720m between turbines and the closest dwellings. The Draft Revised Guidelines outlines a minimum 500m or 4 times tip height set back. Following completion of layout optimisation, a separation distance of 720m was achieved from the closest third party dwelling to a turbine tower. There are 26 no. dwellings located within 1km of the wind turbines. One property is located within this distance however it is owned by an involved landowner who has agreed a reduced setback distance to the property with the Applicant.

Consequently, this complies with the setback distance outlined in both the current 2006 Guidelines and the Draft Revised Guidelines (2019).

15.3.2.2 Clare County Development Plan 2017 – 2023

The current Clare County Development Plan 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. The proposal site is shown to be located in LCT26 – Upland Hills and correspondingly in LCA9 – Slieve Bernagh Uplands (refer to Figure 15.3 and Figure 15.4).

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 area 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. The proposal site is contained within the 'Settled Landscapes' category (Figure 15.5 refers) and the relevant landscape objectives from the Clare County Development Plan are provided below;

A - *To permit development in these areas that will sustain economic activity, and enhance social well-being and quality of life – subject to conformity with all other relevant provisions of the Plan and the availability and protection of resources;*

B *– That selection of appropriate sites in the first instances within this landscape, together within the consideration of the details of siting and design, are directed towards minimising visual impact.*

C *– That particular regard should be given to avoiding intrusions on scenic routes and on ridges or shorelines. Developments in these areas will be required to demonstrate:*

1. *That the site has been selected to avoid visually prominent locations*
2. *That site layouts avail of existing topography and vegetation to reduce visibility from scenic routes, walking trails, public amenities and roads;*
3. *That design for buildings and structures reduce visual impact through careful choice of form, finishes and colours and that any site works seek to reduce visual impact of the development*

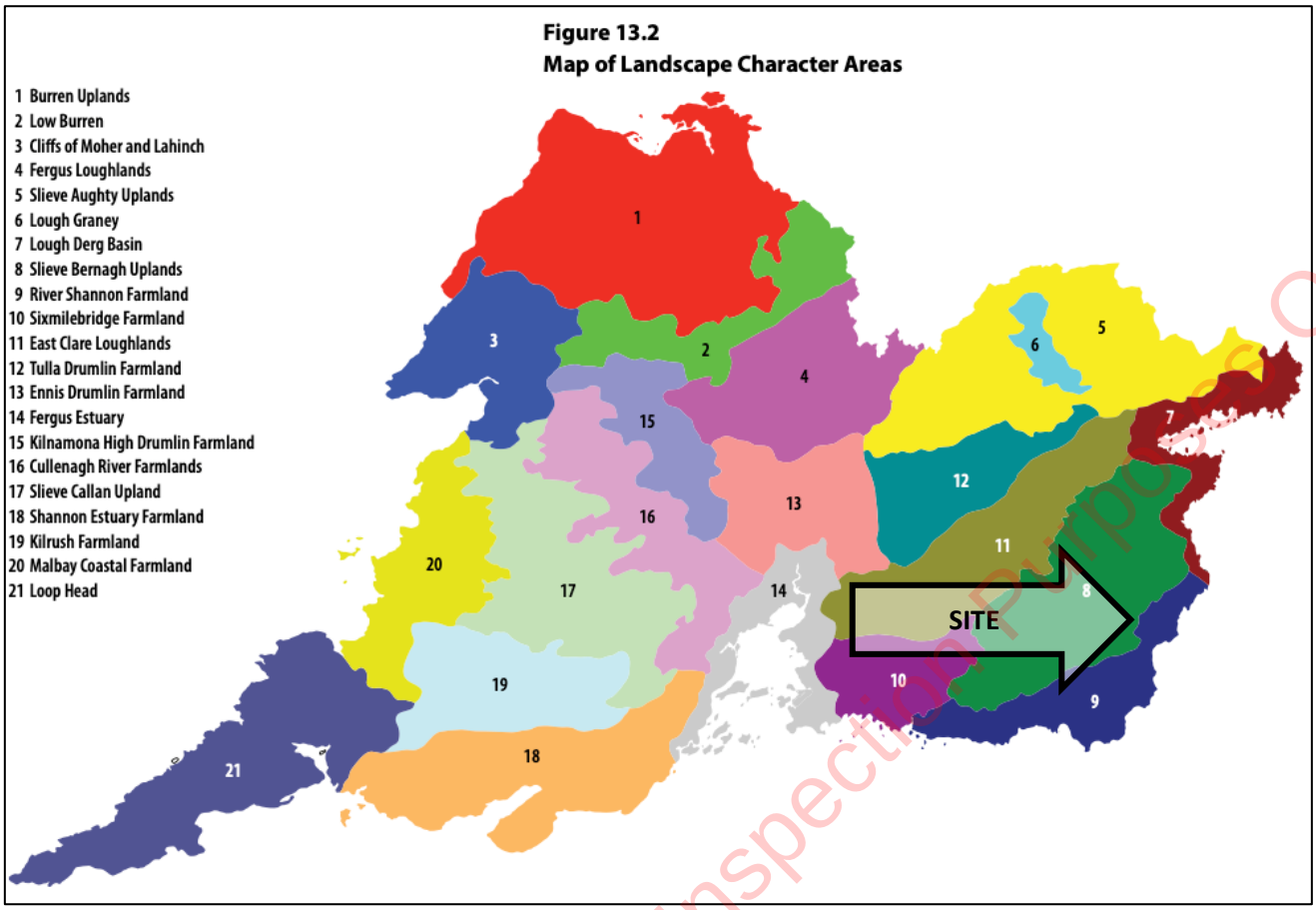

Figure 15-5: Map of Landscape Character Areas within County Clare in relation to the proposed development site

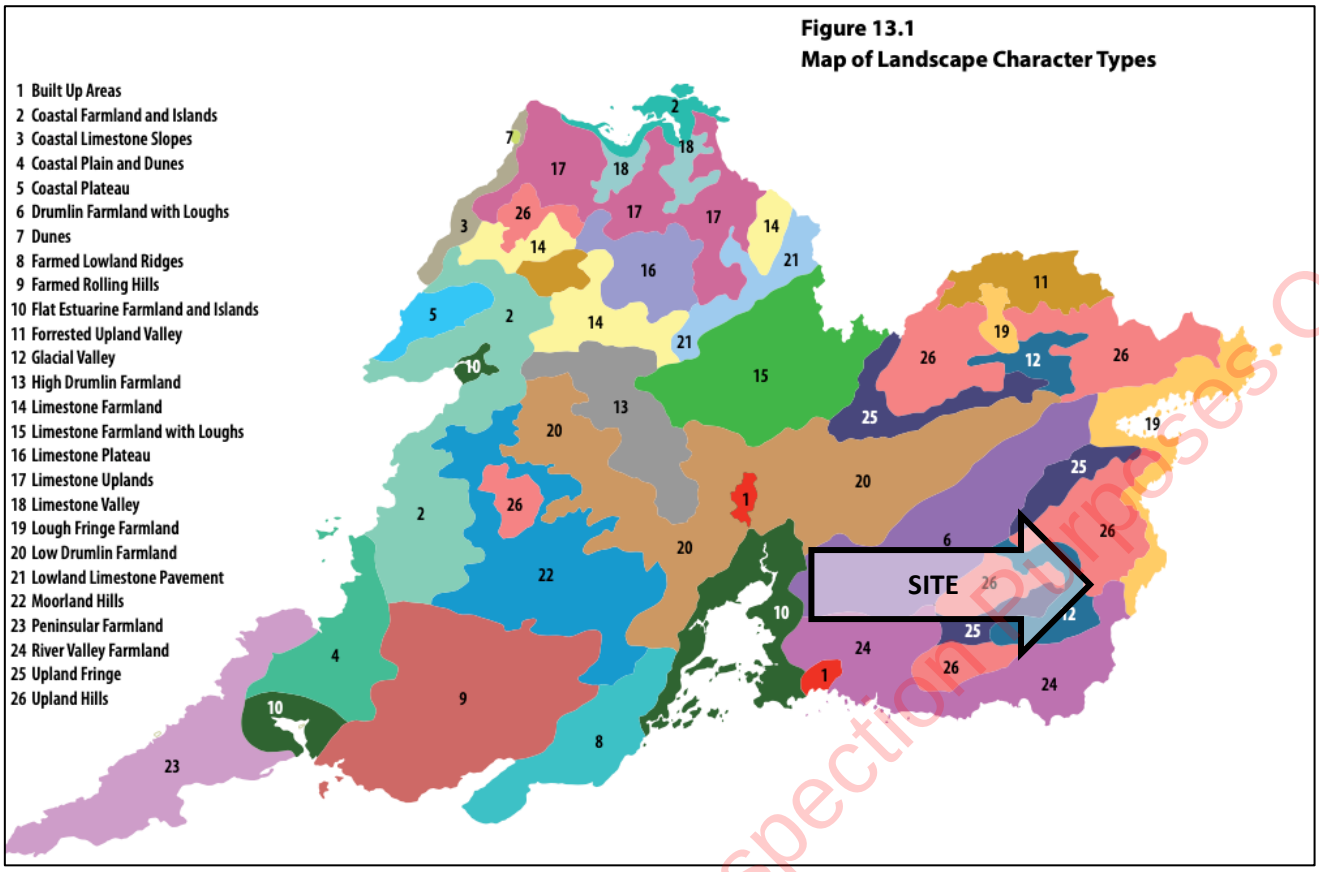

Figure 15-6: Map of Landscape Character Types within County Clare in relation to the proposed development site

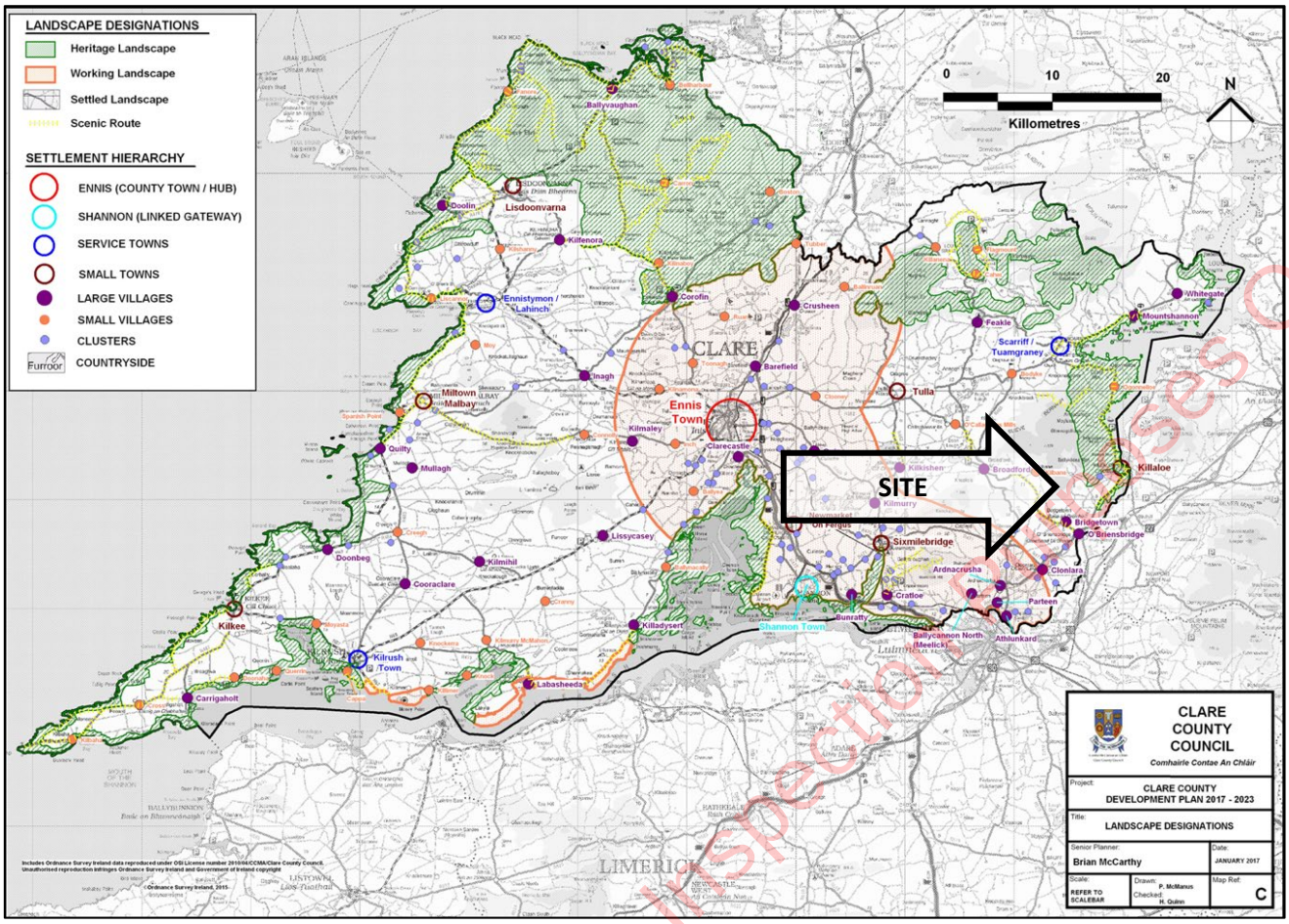

Figure 15-7: Map of Clare's Living Landscape in relation to the proposed development.

Wind Energy Strategy

Clare County Development Plan 2017-2023

A wind energy strategy for County Clare is included within the current Clare County Development Plan in Volume 5. Map E of the current County Development Plan identifies wind energy designations in County Clare. The proposal site is contained within an area identified as being 'Open to Consideration' in terms of wind energy development. There are favourable 'Strategic' and 'Acceptable in Principle' areas a short distance to the west and a less favourable area described as 'Not Normally Permissible' to the east around the Parteen Basin and Lower Lough Derg. The relevant 'Open to Consideration' designation is referenced in the following manner:

> *The Areas Open to Consideration will be assessed on a case by case basis, subject to viable wind speeds, environmental resources and constraints and cumulative impacts.*

Section 4 of the current wind energy strategy relates to the advice on Landscape Capacity for wind energy developments based on Landscape Character Areas (LCA's). In relation to the Slieve Bearnagh Uplands LCA, the landscape here is considered to have a Medium-low sensitivity for wind farm developments and the capacity to accommodate 'Large' developments. The wind energy strategy 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. However, other areas on the north west and westerly aspects of the mountain are more robust and can accommodate number of large or medium wind farms."*

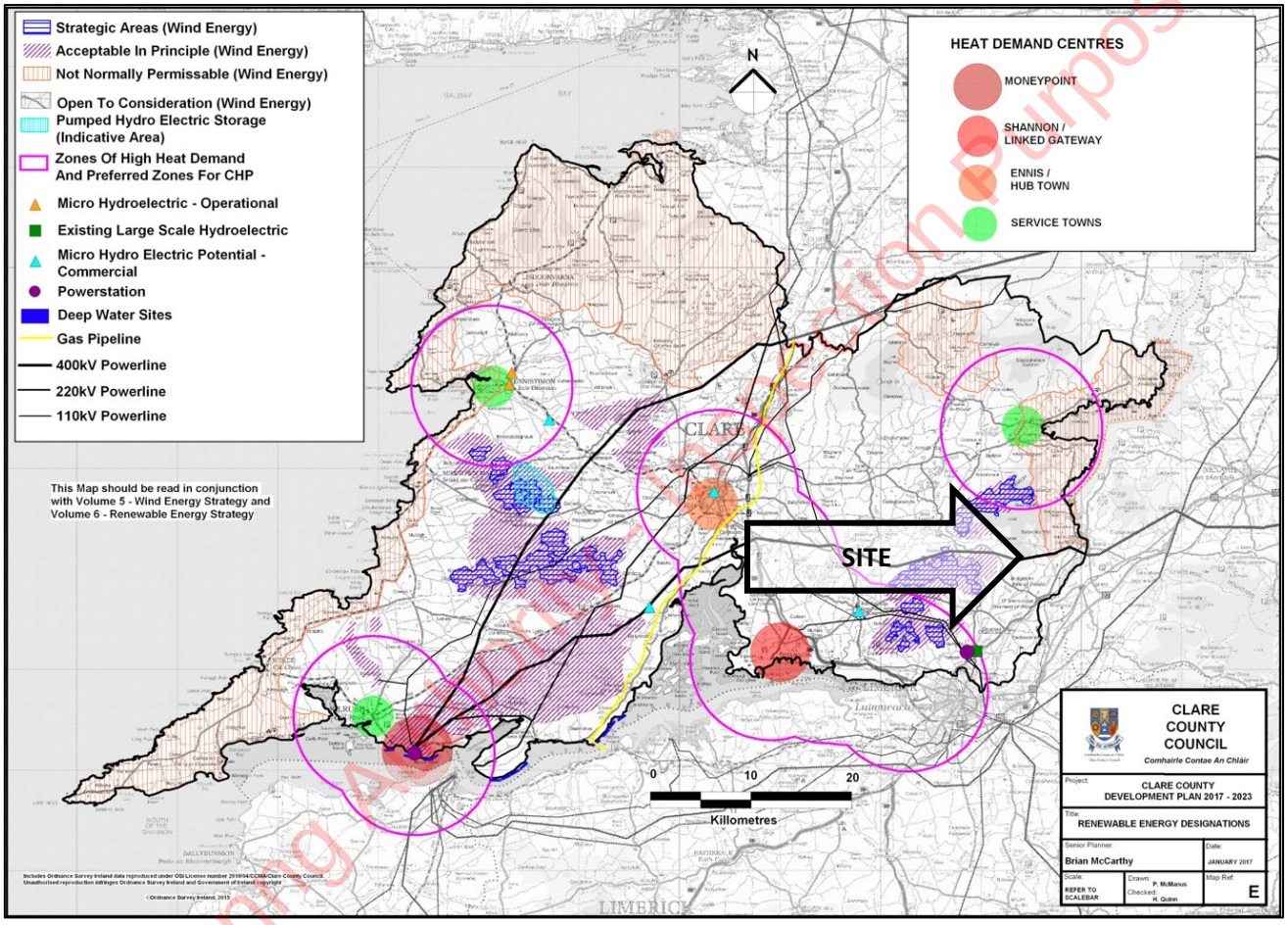

Figure 15-8: Volume 5 of the current Clare County Development Plan showing 'Areas of Wind Energy Potential' in County Clare in relation to the proposed development.

15.3.2.3 Limerick County Development Plan 2022-2028

Whilst the proposed development is wholly contained within County Clare, much of the southern quarter of the study area falls within County Limerick, which comes within 4km southeast of the site. The nearest landscape character unit from the Limerick Landscape Character Assessment is a narrow protrusion of the LCA 6 Shannon Coastal Zone. As its name suggests it is principally defined and described in terms of the broad estuarine sections of the Shannon below Limerick City.

Given the lack of thematic connection to the landscape units within County Clare that contain and flank the site, it is not considered that the Landscape Character Assessment, landscape designations and / wind energy related policies from the Limerick County Development Plan are material in this instance. As the proposed development is potentially visible from substantial portions of northern Limerick, the CDP scenic designations remain relevant and will be addressed in the visual baseline (section 15.4).

15.3.2.4 Tipperary County Development Plan 2022 – 2028

The nearest portion of County Tipperary to the site is a similar distance to the nearest portion of Limerick i.e. around 4km to the southeast. The Tipperary Landscape Character Assessment identifies that the nearest Landscape Character Type is 'Lakelands' in the surrounds of the Parteen Basin and the subcategory is 'B2 - Lakeland Enclosures' described as *"Uplands – both in Tipperary and Clare define much of the southern part*

of Lough Derg – creating very distinctive and highly valued landscapes". At a finer scale, the relevant Landscape Character Areas are '*LCA12 – River Shannon Newport*' and '*LCA13 – Ara Mountains – Lower Lough Derg*'. In terms of sensitivity, both of these LCAs are assigned Class 4 – Transitional Vulnerability, which is the second highest category of sensitivity out of six classes. Again, the separation distances and lack of contextual landscape connection to the upland site render the Tipperary CDP landscape and wind energy related policies and designations as not particularly relevant to this assessment. However, due to potential for mid and long range visibility from Tipperary, the scenic designations will be relevant (See Visual Baseline at section 15.4).

15.3.2.5 Ecological Designations

Ecological designations such as Special Areas of Conservation (SAC's), Special Protection Areas (SPA's) and Natural Heritage Areas (NHA'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, wind energy policy references ecological designations in the context of Lackereagh Mountain as an important consideration.

In this instance, the ecological designations within the central study area entail:

- Special Area Conservation: Slieve Bernagh Bog SAC
- Special Area Conservation: Glenomra Wood SAC (also Proposed Natural Heritage Area: Glenomra Wood)
- Special Area Conservation: Lower River Shannon SAC
- Special Area Conservation: Danes Hole, Poulnalecka SAC
- Proposed Natural Heritage Area: Lough Derg
- Special Protection Area: Lough Derg (Shannon) SPA (also Proposed Natural Heritage Area: Lough Derg)
- Natural Heritage Area: Doon Lough NHA
- Natural Heritage Area: Gortacullin Bog NHA

15.4 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.

15.4.1 Zone of Theoretical Visibility (ZTV)

A computer generated Zone of Theoretical Visibility (ZTV) map has been prepared to illustrate where the proposed turbines are potentially visible from. 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. The ZTV below (Figure 15.9) is based on the tip height of the proposed turbines.

The following, key points are illustrated by the 'bare-ground' ZTV map (see Figure 15.9, below):

- The ZTV pattern is heavily weighted to the southern portions of the study area with very little visibility to the north of the site due to the fact that the turbines will be backed by taller mountains immediately to the north. The main exception isa fan of visibility to the northwest that is afforded through the Broadford Gap, but will only allow visibility from beyond about 10km. There is also some visibility to the northeast from the eastern slopes of the Arra Mountains above Lough Derg.
- Visibility reflects the various upland aspects of the study area. The site facing slopes of these areas generally feature partial to full visibility, while the leeward sides of the upland areas feature little to no visibility. The southern faces of the Arra and Slieve Bearnagh feature a high degree of visibility. There is one gap in visibility across the Slieve Bearnagh Mountains, as Lackereagh Mountain screens much of the site through the intervening valley which defines Lackereagh from the main upland area.
- The eastern shore of Lough Derg features some visibility, which increases with distance from the waterline, however, further to the north this band of visibility narrows and ceases around Castlelough. The western shore, and much of the north/northwest of the study area affords little or no visibility. There is a small degree of visibility from the foothills of Slieve Aughty Mountains, however this is at the far perimeter of the study area.
- The slight curve in the valley immediately southwest of the site, allows a flare of visibility out to the west of the study area, which is narrow where it passes between the Slieve Bearnagh Mountains and Seefin, before widening across the rolling landscape to the edge of the study area. From the western boundary of the study area, southward to Limerick city there are two small breakthroughs of visibility, otherwise isolated and from the north/eastern side of Seefin/Woodcock Hill.
- Visibility is extensive and consistent to the south where it coincides with the plains of Limerick and Tipperary. Limerick, the largest population centre across the study area, and the landscape surrounding it to the east and south, has clear visibility. There are small variations across this area, where localised undulations in the landform create screening. Generally the southwest to southeast of the study area features a high degree of visibility, up to the Slieve Felim Mountains, which feature patchy visibility across the varied upland areas.

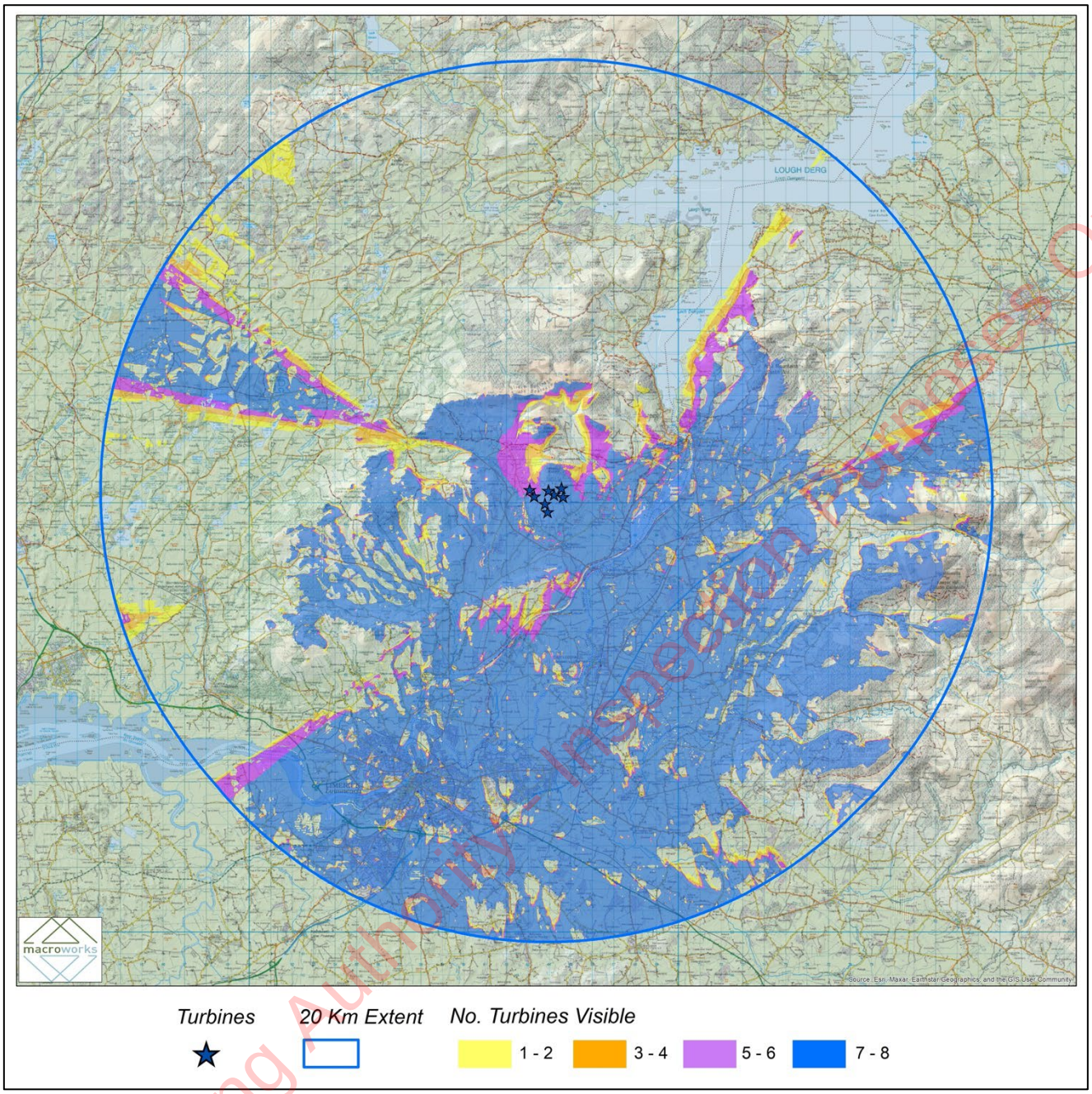

Figure 15-9: ZTV Map (Tip Height) for Fahy Beg Wind Farm (See Appendix 15.2 for full scale annotated ZTV maps)

15.4.2 Visual Receptors

15.4.2.1 Centres of Population and Houses

There are a variety of private residences through the central and wider study area and these are both on small rural/residential lots and associated with larger agricultural properties. Through the wider agricultural areas, the farming residences are more common, while around the periphery of the frequent waterways, the individual residential properties are clustered along the edges of the Shannon and Lough Derg in particular.

The closest cluster of residences/centre of population is Bridgetown, located 1.6km to the southeast. A further 2km southeast of the site is O'Briensbridge (c. 3.6km), located along/between the Shannon Canal and River. To the north along this same waterway is the more significant centre of Killaloe/Ballina, 6km northeast of the site. Other centres along the Shannon are Cloonlara (6km south of the site), and Castleconnell (7km). At the southern extent of the Shannon through the study area, is the largest centre of population by far within the study area, Limerick City. The northern periphery of built up area is 11.5km from site, while the centre is located 14km south, and the wider developed area continues to the southern boundary of the study area, on both sides of the Shannon. At the base of the Slieve Felim Mountains, to the east of the site, there are the smaller centres of Moroe (17km S/SE), and Newport (11km SE). To the wider west of the study area, there is Cratloe (17.5km SW), along the edge of the Shannon Estuary, Sixmilebridge (16km W/SW), Kilmurry (16km W), Kilkishen (14km W), Tulla (17km NW), and Tuamgraney/Scariff (13km N). The nearest centre to the site from the west is Broadford, which sits at the base of the Slieve Bearnagh Mountains, 6km west of the site.

15.4.2.2 Transport Routes

The main transport route through the study area is the M7, located 7km southeast of the site at its nearest point. The M7 runs from the northeast corner of the study area, in a southwest direction between the Shannon and upland areas to the east of the study area. This runs to the south of Limerick to the M20, which then exits the study area to at the southwest. There is also a rail line following a similar trajectory through the study area from the northeast (6km East of the site at nearest) to Limerick City, which as a main centre features the highest density and connectivity of major routes. There is a second rail line which enters the study area from the southeast to terminate within Limerick City, while a third runs northwest from Limerick, around the southwestern periphery of the study area to exit near Sixmilebridge. The N18, N69 and N24 all disperse away from the site from Limerick, and exits the study area in their respective directions. In the northern and central study area, major routes are limited to regional roads, however there is a dense overlay of them across the study area. Those nearest to the site are the R446 (1km W), R465 (3.5km SW), R463 (3km SE), with the R471 (5km S), R445 (6km SE), R494 (7km E) within the central study area.

15.4.2.3 Tourism, Recreational and Heritage Features

The main amenity features through the study area are focused around the major landscape features, such as the River Shannon, Parteen Basin and Lough Derg. There are two national way-marked trails through the study area, with both the East Clare Way National Waymarked Way and the Lough Derg Way National Waymarked Way passing c. 2km from the site. Immediately south of the study area along the river corridor, there are two loop trails heading north and south from O'Briensbridge (O'Briensbridge - Old Barge loop, and O'Briensbridge - Parteen Weir loop). Every mountain range across the study area features walking routes, as does the smaller upland area made of Seefin and Knockaunnamoughilly. To the west of the study area, there is the Craggaunowen Archaeological Park (16km west of the site). Also to the west is Knappogue Castle (19km W). To the north of the site, and west across Lough Derg, there is the Graves of the Leinstermen on the slopes of the Arra mountains and Brian Boru's Fort at Killaloe. On the shores of Lough Derg, there is also Ballycuggaran Forest Car Park, and West Lake Aqua Park.

There are a selection of smaller, more local features throughout the study area, with multiple GAA grounds, and a cluster to the south at Limerick. The University of Limerick at the south of the study area features historic and amenity sites throughout the grounds. Plassey Mill is located along the Shannon near the University, as is the Rowing Club, Boat House and further west, the Corbally Baths. Within Limerick city itself there is a denser cluster of historic features, such as King John's Castle. Ardnacrusha Hydro Station is a site of more recent interest. There are a number of protected structures throughout the study area, these generally are not major tourism attractions, but rather a historic overlay to serve as landscape context, and therefore is noted here.

The full number and location of these features are identified on Maps I8 and I12 of the Clare County Development Plan.

15.4.3 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 websites, touring maps, guide books, or road side rest stops that represent the area. All of the scenic routes and views that fell inside the ZTV pattern were investigated during fieldwork to determine whether actual views of the proposed wind farm might be afforded. If visibility may occur, a viewpoint has been selected for use in the visual impact appraisal later in this chapter.

The scenic routes and views identified in Table 15.5 below are those located within the study area and covered in Map 13A and Appendix 5 of the Co. Clare 2017 – 2023 CDP, Figure 1 'Location of Scenic Routes and Views' within Appendix 11 of the Tipperary 2022 – 2028 CDP, and Map 6.2 Views and Prospects within Chapter 6, Environment Heritage, Landscape and Green Infrastructure of the Limerick CDP 2022 – 2028. The table sets out whether each is deemed relevant to the visual impact assessment and, if so, what the representative viewpoint is, herein.

Table 15-5: Scenic Designations within the Study Area

CPD ID	Direction/Focus of view	Within ZTV	Representative Viewpoint
Clare: 22	From Brickhill Bridge north east to road junction at Reaskcamoge	No	N/A. Not within ZTV
Clare: 23	Road from Cratloe north east through Gallows Hill to Glennagross	Partial	N/A
Clare: 24	Views in and out of Lough Cullaunyheeda	Yes	N/A. Focus of view away from site
Clare: 25	Views in and out of Doon Lough	No	N/A. Not within ZTV
Clare: 26	R466 between Broadford and O'Briensbridge	Yes	VP2, VP4, VP8, VP9
Clare: 27	R463 from O'Briensbridge through Killaloe to outside Ogonnelloe	Yes	VP12
Clare: 28	R463 from Tuamgraney to Mountshannon	No	N/A. Not within ZTV
Clare: 32	Road from Church at Ballylaghan crossroads as far as the crossroads at Caherhurly (part of the East Clare Way)	No	N/A. Not within ZTV
Tipperary: V44	Views west and sections of the Road to the east of the R494	Yes	VP13, VP14
Tipperary: V45	Views along Lakeside Roads north of Portroe	Partial	N/A
V57	View s along the R503 western approach road to Newport	Yes	VP19
Tipperary: V59	Views of surrounding landscape from M7 including Annaholty and Rossfinch	Yes	VP18 (nearest VP)

CPD ID	Direction/Focus of view	Within ZTV	Representative Viewpoint
Tipperary: V60	Views of landscape from M7 at Gortmore southwest of Nenagh	No	N/A. Not within ZTV
Limerick: Woodstock/Glenstal Abbey Scenic Route	Semi-loop road from Moroe/Liscreagh to the northeast and looping around Glenstal to Woodstock and Ballyedmond.	Partial	VP20

15.4.4 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 project. Instead, a variety of receptor locations were 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);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and
- Amenity and heritage features;

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 Designated 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 EIA 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 rail lines 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.

Amenity 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 Table 15.6 and Figure 15-10, below.

Table 15-6: Selected Viewshed Reference Points (VRP's)

VRP No.	Location	Rationale for selection	Direction of view
VP1	**Local Road at Cloongaheen East**	• Amenity and Heritage Feature (Way-marked walking trail) • Local Community Views	SE
VP2	**R466 at Cloonygonry More**	• Scenic Route • Major route • Local Community Views	SE
VP3	**St Mary's Church Kilbane**	• Local Community Views • Heritage Feature (Graveyard)	SE
VP4	**R466 at Springmount**	• Scenic Route • Major route • Local Community Views	NE
VP5	**Local Road at Ballyquin More**	• Local Community Views	E
VP6	**Local Road at Fahymore (North)**	• Local Community Views	N
VP7	**Local Road at Kilroughil**	• Local Community Views	W
VP8	**Bridgetown**	• Scenic Route • Centre of Population • Local Community Views	N
VP9	**R466 at Bridgetown**	• Scenic Route • Centre of Population • Local Community Views • Major route	N
VP10	**O'Briensbridge**	• Centre of Population • Local Community Views • Major route	NW
VP11	**R527 at Towlerton**	• Centre of Population • Major route	N
VP12	**R463 at Ardcloony**	• Scenic Route • Amenity and Heritage Feature (Way-marked walking trail) • Local Community Views • Major route	W
VP13	**R494 at Townlough Lower**	• Scenic Route • Major route	SW
VP14	**R494 at Ryninch Upper**	• Scenic Route • Major route	SW
VP15	**Local road at Leagane**	• Amenity and Heritage Feature (Way-marked walking trail)	

VRP No.	Location	Rationale for selection	Direction of view
VP16	**Local road at Ballina**	• Centre of Population • Amenity and Heritage Feature (Way-marked walking trail / heritage village) • Major route	SW
VP17	**R494 at Ballina**	• Centre of Population • Amenity and Heritage Feature (Way-marked walking trail / heritage village) • Major route	SW
VP18	**Birdhill**	• Centre of Population • Major route	NW
VP19	**R503 at Shower**	• Major route	SW
VP20	**Local road, Ashhoe**	• Scenic Route	

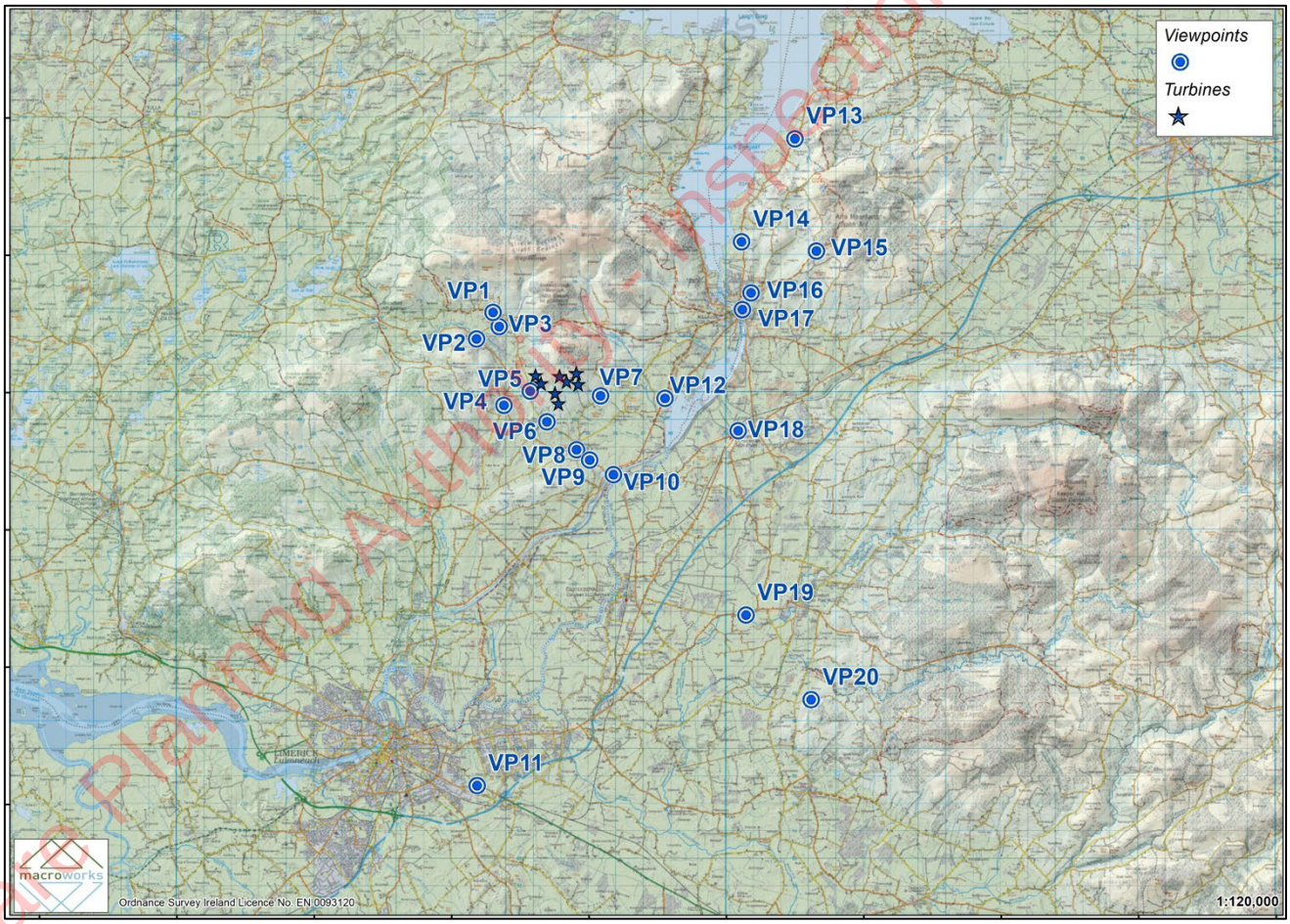

Figure 15-10: Map of Viewpoint Locations

15.5 Potential Impacts

Based on the assessment criteria employed herein, potential significant impacts 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 15.1, Table 15.2 and Table 15.4). It is considered that potentially significant landscape and visual impacts from wind farm developments, have the potential to occur in the following ways:

Landscape Impacts

a) Irreversible physical effects on sensitive landscape features;

b) Disruption of existing land use patterns;

c) Incongruous change to areas of sensitive landscape character.

Visual Impacts

a) A combination of visual and spatial dominance as seen from highly sensitive receptor locations. This is most likely to occur within 1-3km of the proposed development.

b) Visual clutter and ambiguity, if seen from highly sensitive receptor locations. This can occur at any distance, but tends to occur beyond 2-3km, when turbines can become stacked in perspective and a more two dimensional layout is perceived.

c) A combination of both of the above effects.

15.6 Mitigation Measures

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 main form of landscape and visual mitigation employed is the buffering of residential receptors.

15.6.1 Buffering of Residential Receptors

For the proposed Fahy Beg Wind Farm, a minimum setback distance of 706m is required. All of the buffer distances comply with the setback distance outlined in the current 2006 Guidelines and the Draft Revised Guidelines (2019). Complying with the setback limits is important because the perceived scale of turbines reduces exponentially with distance. 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 is, 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 15.11 below.

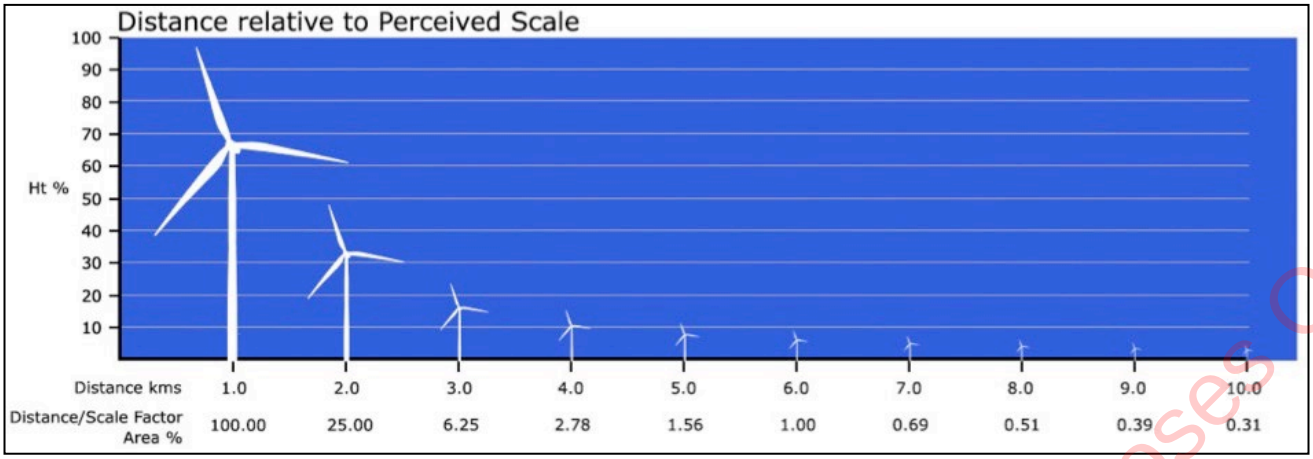

Figure 15-11: Turbine 'scale in relation to distance' relationship

15.7 Residual Landscape Effects

15.7.1 Landscape Character, Value and Sensitivity

Effects on landscape character will be considered at both the localised scale of the site and its immediately surrounding landscape as well as the broader scale of the Study Area. The following summarises and deduces those observations made in Section 15.3.

Central Study Area (< c. 5km from nearest turbines)

The central study area is contained by the Slieve Bernagh Mountains to the north, which the site is located on one of the secondary, and slightly outlying peaks of. This upland landscape features higher value and sensitivity as the elevation rises. The lower sections are typical farmland, common across the immediate and wider study area, however with a higher degree of tall vegetation, and smaller field sizes. This is also true of the valley to the west/southwest of the site, and the rolling foothills of Formoyle and Seefin on the opposite side. The combination of vegetation and sloping topography results in some of highest degree of landscape / visual enclosure to be found across the central and wider study area. While this means the likelihood of broad views across to the site are less common, where views do occur they tend to be framed and focussed. This area also has a relatively dense coverage of receptors in the form of private residences across this part of the landscape.

The area of 'transitional slopes' makes up the majority of the central study area, transitioning to steeper, upland areas to the northwest, and opening to more level, lowland landform to the southeast over the Shannon. This contrast in topography also corresponds with the intensity of landscape modification and population. As such, while there are a greater density of receptors to the south and east of the site, the landscape also features a higher degree of modification, and is identified in the Clare CDP as being '*where the majority of the population live and work*', and '*contain the resources of land, soil, minerals and water that are used to sustain the economy. They accommodate the roads, power-lines, quarries and piped services that service settlements and industry*'. It should also be noted that the southern/southwestern section of the study area borders the *'Western Corridor Working Landscape: This part of the County contains the highest concentrations of population and employment and the strongest transport links and connectivity'*.

To the north and northwest, the density of population reduces, as the dominant land use transitions to conifer forestry, overlain with a network of walkways and recreational uses. These form a buffer between the settled landscapes previously described, and the open bogland across the highest sections of the Slieve Bernagh Mountains, which entirely contain the northern periphery of the central study area. The contrast between open and enclosing landuse/cover is more prominent in this area. The conservation and recreation values of this section of the study area are derived from, and linked to, the 'natural' appearance of the landscape, with low density of built form and few overt anthropogenic features. The elevation allows broad views across the surrounding landscape and associated natural and scenic features as well as productive landscape features and patterns. The final key element of the central study area is the highly modified area surrounding the Parteen Weir and Ardnacrusha Canal, which is located at the north-eastern periphery of the central study area and is designated as a 'Heritage Landscape' in the Clare CDP; - '*the most valued parts of the County – that are important to the people of County Clare as well as the wider community – both nationally and internationally. The principal role of these landscapes is to sustain natural and cultural heritage'*. With recognition of this overlay, the area of the Shannon directly east and northeast of the site is considered to be of different sensitivity to that further southwards. This also relates to the landscape within the wider study area along the Shannon Corridor. Northwards, there is a more dramatic relationship, and closer proximity between upland areas and waterbodies (Parteen Basin / Lough Derg), while to the south the landscape is more functional, dictated by the utilitarian energy uses surrounding the river, canal and Ardnacrusha Power Station.

On balance of the above factors, the site and northern half of the central study area are considered to have a **Medium** landscape sensitivity, while the southern section of the central study area is considered to be **Medium-low.** This is reinforced by the relative proximity to the different 'Living Landscapes' identified in the Clare CDP.

Wider Study Area (c. 5-20km)

Overall, the wider study area follows the patterns identified above. There are more sensitive, scenic landscape values surrounding the variety of upland areas across the study area, bordered by transitional farmland covered in hedgerows and private/farm residences. Across the southern section of the study area, the open, lowland areas feature lower density of vegetation, however wide scale visibility is limited by the level topography. To the north, there are more sensitive areas surrounding Lough Derg and the smaller loughs to the west of the site. This is reflected in the Clare CDP, with the southern section of the study area designated 'Working Landscape' and the northern a combination of 'Settled' and 'Heritage'. The landscape within Tipperary bordering the north/west of the Shannon Corridor and study area are both designated Class 4: Sensitive Landscape.

For the reasons outlined above, the wider study area is generally considered to be of a **Medium** landscape sensitivity, but with occasional landscape features and areas of higher and lower sensitivity – Generally higher to the north, and lower southwards.

15.7.2 Magnitude of Landscape Impacts

The physical landscape as well as the character of the proposed development and its central study area (<5km) is affected by the proposed wind turbines as well as ancillary development such as access and circulation roads, areas of hard standing for the turbines, grid connection and the proposed substation compound. By contrast, for the wider landscape of the study area, landscape impacts relate exclusively to the influence of the proposed turbines on landscape character. The aspects of the proposed development that are likely to have an impact on the physical landscape and landscape character are described in Chapter 3 (Description of Proposed Development) with construction processes described in the Construction and Environmental Management Plan (CEMP) included in Appendix 3.1.

15.7.2.1 Construction Stage Effects on the Physical Landscape

It is considered that the proposed wind farm development will have a modest physical impact on the landscape within the site as none of the proposed development features have a large 'footprint' and land disturbance/vegetation clearing will be relatively limited. The topography and land cover of the proposed site will remain largely unaltered with construction being limited to elements such as proposed tracks, areas of hard standing for the turbines, the on-site substation compound, temporary site construction compound and proposed met mast. Excavations will tie into existing ground levels and will be the minimum required for efficient working. Any temporary excavations or stockpiles of material will be re-graded to marry into existing site levels and reseeded appropriately in conjunction with advice from the project ecologist.

There is an extensive network of existing agricultural and forestry tracks within the site and 8.5km of this existing track network will need to be upgraded. The proposed project also includes approx. 7.1km of new internal access tracks that will be required to be constructed. The finalised internal track layout has been designed to avoid environmental constraints, and every effort has been made to minimise the length of proposed tracks by utilising and upgrading the existing tracks. Furthermore, the track layout has been designed to follow the natural contours of the land wherever possible to prevent steep sections and to, reduce potential for areas of excessive 'cut and fill'. There will be three watercourse crossings within the site and these use a combination of a clear span bridge, a ford and a culvert. Minor drainage features will be culverted. The other main features of land disturbance and vegetation clearance are proposed crane hard stands and set down areas around the base of each turbine. The crane hard stands will be 40m X 75m in area and consist of compacted fill. These will remain in place for the operation life of the development to facility occasional maintenance, however they are readily removed and restored at decommissioning representing a 'reversible' effect.

Three of the proposed turbines occur within currently forested areas where the felling regime will need to be modified to facilitate their construction. Permanent felling of forestry will be required around the wind farm infrastructure. This is not considered to be an overt impact in the context of a commercially forested area where forestry rotations consist of near constant felling of mature compartments in different sections of the landscape generating a patchwork appearance that alters in location, but not nature.

There will be an intensity of construction stage activity associated with the access tracks and turbine hardstands consisting of the movement of heavy machinery and materials, but this will be temporary/short term in duration and transient in location. The construction stage effects on landscape character from these familiar and dispersed surface activities will be minor.

There will be one 38kV on-site substation compound constructed to collect the generated power from the proposed development before distributing it to the existing 110kV substation at Ardnacrusha Power station. The proposed 38kV on-site substation compound will measure 51.5m x 29.2m, with its control building measuring 23.9m(L) by 10m(W) and 6m(H). The most notable construction stage landscape impacts resulting from the proposed on-site substation relate to the construction of concrete foundations to facilitate that substation building. Overall, these construction stage effects are relatively minor and compare to the construction of an industrial farm shed.

All internal site cabling will be underground, following site access tracks without the need for trenching through open ground. Indeed, the land cover of the site will only be interrupted as necessary to build the structures of the proposed wind farm and to provide access. Impacts from land disturbance and vegetation loss at the site are considered to be modest in the context of this landscape setting.

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 most notable construction stage effects here relate to the minor amount of ground excavation required to facilitate the shallow foundations for the steel mast structure.

The grid connection cabling to Ardnacrusha power station will be approx. 10.6km in length, to be constructed within the existing road corridor. No overhead lines are required for this connection. Connection works will involve the installation of ducting, joint bays, drainage and ancillary infrastructure and the subsequent running of cables. This will require delivery of plant and construction materials, followed by ground excavation laying of cables and subsequent reinstatement of trenches, and will result in minor and very localised construction stage landscape effects.

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, especially towards the end when constructed and partially constructed (but not yet commissioned) turbines face in different directions and are flanked by tower cranes. However, it is a 'short-term' impact that will cease as soon as the proposed development is constructed and becomes operational (approximately 12-18 months from the commencement of construction).

There will be some long term/permanent construction stage effects on the physical landscape in the form of turbine foundations and hardstands, access tracks and a substation, but only the on-site substation is likely to remain in perpetuity as part of the national grid network. It is likely that, with the exception of some residually useful access tracks, all other development features will be removed from the project site and it will be reinstated to agricultural or forestry use upon decommissioning. Thus, the construction stage landscape effects of the proposed development are largely reversible.

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) in Appendix 3.1. Such effects will be temporary/short term in duration and are, therefore, not considered to be significant.

15.7.2.2 Operational and Decommissioning Stage Effects on Landscape Character

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 there are no other wind farms in the immediate vicinity, but they are a familiar feature of the wider study area, particularly within the Silvermines Mountains to the southeast.

In terms of scale and function, the proposed wind farm is well assimilated within the context of the central study area. This is due to the nature of the landform, landscape elements and land use patterns. These attributes prevent the height and extent of the proposed wind farm causing the type of scale conflict that can occur in other landscape areas. The central study area has a notable utilitarian, much-modified character and although the proposed development represents a stronger human presence and intensity / scale of built development than currently exists on the site, it will not detract significantly from its productive rural character, where the wind turbines are perceived as an additional supplementary layer of productivity above ground-based farming and forestry enterprises.

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 project is 35 years, after which time it will be dismantled and the landscape reinstated to prevailing conditions. Within 2-3 years of decommissioning, it is likely that there will be little evidence a wind farm ever existed on the site, albeit the proposed on-site substation will remain in perpetuity as part of the national grid infrastructure, in addition to some residually useful access tracks.

The decommissioning phase will have similar temporary impacts as the construction phase with the movement of large turbine components away from the site. This may potentially result in the minor loss of roadside and trackside vegetation that has grown during the operation phase of the project, but this can be reinstated upon completion of decommissioning. Areas of hard standing that are of no further use will be reinstated and reseeded to blend with the prevailing surrounding land cover of the time. It is expected that the decommissioning phase would be completed within a period of approximately 6 months.

In summary, there will be physical impacts on the land cover of the site as a result of the proposed development during the operational phase, but these will be relatively minor in the context of this productive rural landscape. The scale of the proposed development will be well assimilated within its landscape context without undue conflicts of scale with underlying landform and land use patterns. For these reasons the magnitude of the landscape impact is deemed to be **Medium** within the Central Study Area. Beyond 5km from the site, the residual 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.

15.7.3 Significance of Landscape Effects

The significance of landscape impacts is a function of landscape sensitivity weighed against the magnitude of the landscape impact. This is derived from the significance matrix (Table 15.3) used in combination with professional judgement. Based on the 'Medium' Landscape sensitivity assigned in Section 15.7.1 and the worst-case 'Medium' magnitude of landscape impact assigned in section 15.7.2 the significance of residual landscape impact is considered to be **Moderate** within the site and its immediate context reducing to **Moderate-slight** beyond approximately 2km where the wind farm is likely to be an overt, but supplementary rather than defining feature of the landscape setting. This is considered to be the same for both construction stage and operational stage as it is the emergence of the turbines and their influence on landscape character that is the principal contributor to landscape effects.

For the wider study area (beyond 5km from the site), residual landscape impact significance is not considered to exceed **Slight** and will reduce to Slight-imperceptible at increasing distances as the project becomes a progressively smaller component of the wider landscape fabric even in the context of higher sensitivity landscape units / features.

It should be noted that the landscape effects described above will be the same for whatever turbine is selected within the range of dimensions provided within the application.

15.8 Residual Visual Effects

Table 15.7 below summarises the full textual assessment of visual effects for each Viewshed Reference Point (VRP) contained in Appendix 15.1. Whilst the 'receptor sensitivity analysis table' and full textual assessment for each VRP is normally contained within the landscape and visual chapter, in this instance, given the 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 distance to the proposed 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.

Table 15-7: Summary of Visual Effects at Viewshed Reference Points (VRPs)

VRP No.	Distance to nearest Visible turbine (km)	Visual receptor Sensitivity (see Appendix 15.1)	Visual Impact Magnitude	Significance of Visual impact
VP1	2.8	**Medium-low**	**Medium-low**	**Moderate-slight / Negative / Long-term**
VP2	2.5	Medium	Medium-low	**Moderate-slight / Negative / Long-term**
VP3	2.2	Medium-low	Medium-low	**Moderate-slight / Negative / Long-term**
VP4	1.6	Medium	Medium-low	**Moderate-slight / Negative / Long-term**
VP5	0.5	Medium low	High-medium	**Moderate / Negative / Long-term**
VP6	0.8	Medium low	High-medium	**Moderate / Negative / Long-term**
VP7	0.9	Medium low	Medium	**Moderate-slight / Negative / Long-term**
VP8	1.8	Medium-low	Medium	**Moderate / Negative / Long-term**
VP9	2.7	Medium	Medium-low	**Moderate-slight / Negative / Long-term**
VP10	3.3	Medium	Medium-low	**Moderate-slight / Negative-neutral / Long-term**
VP11	14.6	Low	Negligible	**Imperceptible/ Neutral/**
VP12	3.2	Medium-low	Medium-low	**Moderate-slight/ Negative-neutral/ Long-term**

VRP No.	Distance to nearest Visible turbine (km)	Visual receptor Sensitivity (see Appendix 15.1)	Visual Impact Magnitude	Significance of Visual impact
VP13	N/A	High-medium	Negligible	**Imperceptible/ Neutral**
VP14	7.7	High-medium	Low-negligible	**Slight/ Negative/ Long-term**
VP15	9.8	High	Low	**Slight/ Negative-neutral/ Long-term**
VP16	7	Medium	Low	**Slight-imperceptible/ Negative-neutral/ Long-term**
VP17	6.5	High medium	Negligible	**Imperceptible/ Neutral**
VP18	6.1	Medium	Low	**Slight-imperceptible/ Negative-neutral/ Long-term**
VP19	10.3	Medium-low	Low	**Slight/ Negative/ Long-term**
VP20	14.2	High-medium	Low-negligible	**Slight-imperceptible/ Negative-neutral/ Long-term**

15.8.1 Impacts on Designated Views

There are relevant scenic routes in all three of the counties contained within the study area, but with the majority in County Clare on the same R466 scenic route that runs past the site to the southwest. The viewing context for the various scenic routes is quite diverse, so they will be grouped by County below.

From the designated scenic routes in County Clare there are four representative viewpoints on the R466 'Broadford Gap' route including VP2, VP4, VP8 and VP9 running around the site from the west to the south. Except for VP8 they all have a similar viewing context consisting of relatively clear and legible views of the turbines rising from the forested slopes of Lackereagh Beg Hill. They appear neither out of scale or out of context in that broad and productive setting and aside from increasing the diversity and intensity / scale of built development within these views there is little detriment to visual amenity. Thus, for VP2 , VP4 and VP9 the significance of visual impact is deemed to be 'Moderate-slight' despite the wind turbines being overt features of each visual setting. At VP8, which is from within the settlement of Bridgetown, it is not considered that the main values and characteristics of the scenic route designation are present.

That is, the scenic route designation simply passes across the settlement rather than starting and stopping on either side of it, which would be more reflective of the variance in scenic amenity. The view of the turbines from Bridgetown rising from beyond an intervening treeline has a lesser degree of contextual legibility than for the aforementioned views, but this is balanced at the same significance judgement (Moderate-slight) due to the lesser degree of sensitivity.

Viewpoint VP12 is on a separate scenic route designation on the R463 as it runs along the western shores of the Parteen Basin to the east of the site where the main visual amenity is in the opposite direction to the site. The uphill view of the turbines to the west is equally legible as those from the R466 scenic route to the west and they are seen with a compatible scale and a profile that follows the descending ridge that hosts them. Again, the significance of visual impact is deemed to be Moderate-slight and mainly on the basis of the increase in intensity of built development within the rural upland setting rather than any sense of incongruity or scale conflict.

The two representative scenic route viewpoints within County Tipperary (VP13 and VP14) are both contained on the same section of the R494, which is slightly elevated and affords scenic vistas across lower Lough Derg before the landscape opens up around the Parteen Basin further south. Whilst there is no view of the proposed turbines from VP13, three distant blade tips in the wireframe view highlight that they may be visible from some locations within this general area, albeit without material consequence for visual amenity (Imperceptible Impact). Moving further south along the R494, VP14 reveals slightly increased exposure and closer proximity to the three blade tips hinted at from VP13. Although the proposed turbines are still substantially screened from view in this scenic setting, the blade tips may be a minor visual distraction to the scene, hence the significance of impact is deemed to be Slight in this instance.

Viewpoint VP20 represents the only relevant designated scenic route in County Limerick from a local road in the townland of Ashhoe. This slightly elevated location in the foothills of the Silvermines Mountains affords vast panoramic vistas to the west wherein, the proposed turbines are fully visible, but at a small scale form a distance of nearly 15km. They rise in a legible manner from distant forest clad hills and have little effect on the visual amenity of this vista across a broad and productive rural landscape.

It is not considered that significant visual impacts will occur in respect of any scenic designations.

15.8.2 Impacts on Local Community views

Local Community views are considered to be those experienced by those people who live, work and move around the area within approximately 5km of the site. These are generally the people that are 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.

The first ten views (VP1 to VP10 as well as VP12) all represent the local community as well as other receptors such as scenic route designations and settlements. Other than those that also represent scenic designations, the sensitivity of local community views tends to be in the order of Medium-low illustrating local amenity value, but in the context of a working rural landscape where views are often enclosed. Of the 11 local community views, the highest significance of visual impact is 'Moderate' at VP5, VP6 and VP8 with the latter (from Bridgetown) having been discussed above in the context of scenic designations. At both VP5 and VP6 there is no argument that the turbines are a close and prominent feature on the slopes above the viewer. However, they are well assimilated within the viewing context in terms of both scale and function in this broad productive setting where they are not overbearing or enclosing and instead, tend to feature as an uphill framing or backing feature of higher amenity views out across the Plains of Limerick in the opposite direction.

They are a good example of where distinct visual change, even in the form of large moving structures, does not unduly compromise rural visual amenity and can present as a supplementary layer of productivity in a setting already valued for such qualities. Perhaps the best example of this is the view from VP4 which is on a designated scenic route and will have a clear and relatively close view of the proposed turbines across a valley also containing forestry, farmland and a large quarry. None of these features is a particular detraction from the view and instead there is a strong sense of compatibility and cohesion between the productive elements. Whilst this particular view was still assigned a Moderate-slight negative significance, due to the increased intensity of built development, it is an excellent example of wind energy integration into upland rural settings from a landscape and visual perspective.

The remaining local community views are all assigned Moderate-slight significance on balance of Medium or Medium-low sensitivity weighed against clear and legible views of the proposed turbines where they increase the intensity, scale and diversity of built development within the particular scene but are not incongruous or overbearing and will not intrude on high amenity aspects of the views.

It is not considered significant visual impacts will occur in respect of local community views.

15.8.3 Impacts on Centres of Population

Six viewpoints were chosen to represent centres of population within the central and wider study area (i.e. VP8, VP10, VP11, VP16, VP17 and VP18) and the first two, which are contained within the central study area representing scenic designations and / or local community views, have already been discussed above.

Despite the ZTV map pattern indicating relatively comprehensive turbine visibility from Limerick City and environs, VP11 illustrates that the nature of that visibility is distant (nearly 15km) and in most cases likely to be at least partially screened by terrain, building and vegetation. Consequently, any visual impacts experienced from Limerick City will be of a very low order such as the 'imperceptible' impact assigned to VP11.

VP16 and VP17 both represent the important tourism and heritage villages of Ballina and Killaloe, which share a bridge across the Shannon on either side of the Tipperary / Clare border. The Ballina side has the most potential for visibility of the proposed development and VP16 is an elevated view above the settlement. VP17 is from the Riverside and is more of a 'postcard' view of the bridge across the Shannon. The proposed turbines are clearly visible as a modest background feature that follows the skyline ridge to the west from VP16 and the significance is deemed to be Slight-imperceptible. Whereas, the turbines will not be visible at all from VP17, which is used as an 'illustrative' view in this instance – to illustrate the absence of effect at a sensitive receptor.

Viewpoint VP18 is from the small and attractive settlement of Birdhill across the Shannon Valley in Tipperary. Again, the turbines will be a notable background feature, but in the context of broad rural views where any negative effect on visual impact is limited.

15.8.4 Impacts on Major Routes

While the M7 motorway runs through the south-eastern quadrant of the study area, there is very little potential for visibility of the proposed wind farm from it due to screening within the motorway corridor by a combination of embankments and vegetation. Furthermore, the motorway is not a particularly sensitive receptor, especially at distances of greater than 7km. Consequently, no viewpoints were considered necessary from the motorway.

Whilst a number of viewpoints are contained on Regional roads, this is secondary to their primary rationale for selection such as being designated scenic routes or passing through key settlements. The summary of all such views is, therefore included in other sections of this summary (Section 15.8).

15.8.5 Impacts on Heritage and Amenity Features

The main heritage and amenity features in this case are a series of national way-marked walking trails, being the Lough Derg Way and the East Clare Way with the former obviously concentrated in the vicinity of Lough Derg and the Parteen Basin and the latter within the uplands to the north of the site. Lough Derg and the Parteen Basin are also key amenity and recreational water bodies within the area and the villages of Killaloe and Ballina on either side of the bridge/ border have recognised heritage, amenity and tourism value. These settlements are represented by VP16 and VP17, which are discussed above under the Centres of Population heading and also happen to be located on sections of the Lough Derg Way. Other viewpoints that are representative of waymarked walking trails include; VP1, VP10, VP12 and VP15. Only VP15 has not been previously discussed under another receptor type heading.

VP15 is from an elevated section of the Lough Derg Way within the Ara Mountains and affords vast panoramic views to the south and west across lower Lough Derg / Parteen Basin and hills of east Clare. It is a clear and legible view of the turbines contained within a productive section of the distant landscape context, where they add only marginally to the intensity and diversity of built development and are considered to have a Slight significance of impact.

Other amenity / tourism locations identified in baseline section 15.4.2.3 include Craggaunowen Archaeological Park (16km west of the site) and Knappogue Castle (19km west). These were not included in the visual impact assessment because the ZTV map showed that visibility of the proposed wind farm would not occur from this part of the study area.

15.8.6 Summary of Visual Impacts

Overall, the proposed development appears well accommodated within this visual setting. Views from the south tend to be clear and legible with the turbines appearing approximately scaled relative to the underlying terrain and land use patterns and contextually assimilated within a productive upland setting of farmland and forestry. From the northern quarters, where some of the more sensitive visual receptors occur, the visibility of the proposed wind farm is more restricted. For these reasons, it is considered that the proposed project will not result in significant visual impacts.

15.9 Turbine Dimension Envelope Consideration

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

The specimen turbine used for the photomontages that informed the visual impact assessment employed the maximum tip height dimension of 176.5m with a median hub height of 107.5m and maximum rotor diameter of 138m. The reason for this is that any variation from the specimen turbine, in the form of an adjusted rotor diameter / hub height ratio, will see a minimal departure from the specimen turbine dimensions.

Any reduction on the overall turbine tip height will only result in reduced impacts relatively to those assessed on the basis of the specimen turbine.

In order to examine the range of potential turbine dimensions, Macro Works prepared comparative photomontages at three of the previously selected viewpoints to represent short and mid-distance views of the development in differing contexts to examine variations in the scale and nature of turbine range visibility.
It was not considered necessary to use long distance views (10km+) for this comparative exercise as any variation in turbine dimensions are even less likely to be read at longer distances and will be indiscernibly different. The comparative scenarios used include;

- Specimen Turbine – 107.5m hub, 138m rotor diameter, 176.5m tip height (as used for the visual impact assessment herein)
- Alternative Scenario 1 - 102.5m hub, 138m rotor diameter, 176.5m tip height
- Alternative Scenario 2 - 110m hub, 131m rotor diameter, 176.5m tip height

As can be seen from the comparative photomontages (Contained at the end of the Photomontage Volume) the variation in turbine dimensions is very difficult to discern across the three scenarios even with considerable scrutiny. This is unsurprising as the variation in hub height is 5m or less from the specimen turbine. There is also no departure from the specimen turbine in terms of tip height. Whilst the variation in rotor dimeter is 6m between the specimen turbine and Alternative scenario 1, this only translates as a variation of 5m in blade length.

Regardless of whether the very subtle difference between the alternative turbine dimensions presented in the comparative photomontages can be discerned or not, it is clear that such differences are so minor they do not have a material consequence to the level of visual impact that has been assessed and none has a higher impact than the specimen turbine used for the submitted LVIA. Thus, the submitted LVIA is deemed to comfortably cover the range of potential turbine dimension options proposed and it is not considered necessary to prepare separate photomontages / assessments at all viewpoints for all possible turbine dimensions within the range.

15.10 Do Nothing Scenario

In a Do-Nothing scenario, the existing land use and land cover is expected to remain broadly as is: aside from the marginal pasture and boggy scrub, the conifer plantations that cloak the majority of the site would continue to be managed through rotations of commercial conifer planting and harvesting.

15.11 Cumulative Impacts

15.11.1 Cumulative Baseline

There is currently two existing wind energy developments within the study area and these both relate to single auto-producer turbines. One for Vision Care within the eastern industrial outskirts of Limerick City and the other for Limerick Blow Mouldings on the northern outskirts of the city. The latter is a modest 73m tip height turbine that is subject to enforcement proceedings to remove it and will not be considered further herein.

There is also one development that has recently been granted planning permission by An Bórd Pleanála and this is the Carrownagowan Wind Farm – Ref. ABP-308799-20 (19 turbines) within the Slieve Bearnagh range around 6km to the north.

15.11.2 Scottish Natural Heritage Guidelines (2012)

The Scottish Natural Heritage (SNH) Guidance relating to 'Assessing the Cumulative Effects of Onshore Wind Farms (2012) identify that cumulative impacts 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 impacts 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 impacts 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), cumulative impacts 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 are 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 15-8 below provides Macro Works' criteria for assessing the magnitude of cumulative impacts, which are in accordance with the SNH Guidelines (2012).

Table 15-8: Magnitude of Cumulative Impacts

Magnitude of Impact	Description
Very High	• 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. • Strongly adverse visual effects will be generated by the proposed turbines in relation to other turbines.
High	• 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. • Significant adverse visual effects will be generated by the proposed turbines in relation to other turbines.
Medium	• The proposed wind farm will contribute to wind energy development being a characteristic element of the surrounding landscape. • It will contribute to a sense of wind farm accumulation and dissemination within the surrounding landscape. • Adverse visual effects might be generated by the proposed turbines in relation to other turbines.
Low	• 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. • It might contribute to wind farm development becoming a familiar feature within the surrounding landscape. • 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.
Negligible	• The proposed wind farm will most often be viewed in isolation or occasionally in conjunction with other distant wind energy developments. • Wind energy development will remain an uncommon landscape feature in the surrounding landscape. • No adverse visual effects will be generated by the proposed turbines in relation to other turbines.

15.11.3 Department of Environment, Heritage and Local Government (DoEHLG) 'Wind Energy Development Guidelines' (2006 / Draft Revised 2019)

The aforementioned DoEHLG guidelines provide direction on wind farm siting and design criteria for a number of different landscape types. The main wind farm site and central study area is considered to be located within a landscape that is consistent with the '*Transitional Marginal Landscapes'* type. However, there are also some aspects of the '*Hilly and Flat Farmland'* landscape type.

The associated guidance that is applicable, with respect to cumulative effects in '*Transitional Marginal Landscapes'* type is:

> *"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."*

However, it is worth noting that the setting of the proposed development is not within a "confined setting," or anything resembling such. The associated guidance that is applicable, with respect to cumulative effects in '*Hilly and Flat Farmland'* landscape type, is:

> *"It is important that wind energy development is never perceived to visually dominate. However, given that these landscapes comprise hedgerows and often hills, and that views across the landscape will likely be intermittent and partially obscured, visibility of two or more wind energy developments is usually acceptable."*

General guidance in relation to cumulative effects is provided in Chapter 6 of the Guidelines – 'Aesthetic Considerations in Siting and Design'. The most relevant aspect of guidance in this instance is contained in the fourth bullet point, which states:

> *"It is preferable to avoid locating turbines where they can be seen one behind another, when viewed from highly sensitive key viewpoints (for example, viewing points along walking or scenic routes, or from designated views and prospects), as this results in visual stacking and, thus, confusion. This may not be critical, however, where the wind energy development to the rear is in the distant background."*

15.11.4 Cumulative Zone of Theoretical Visibility

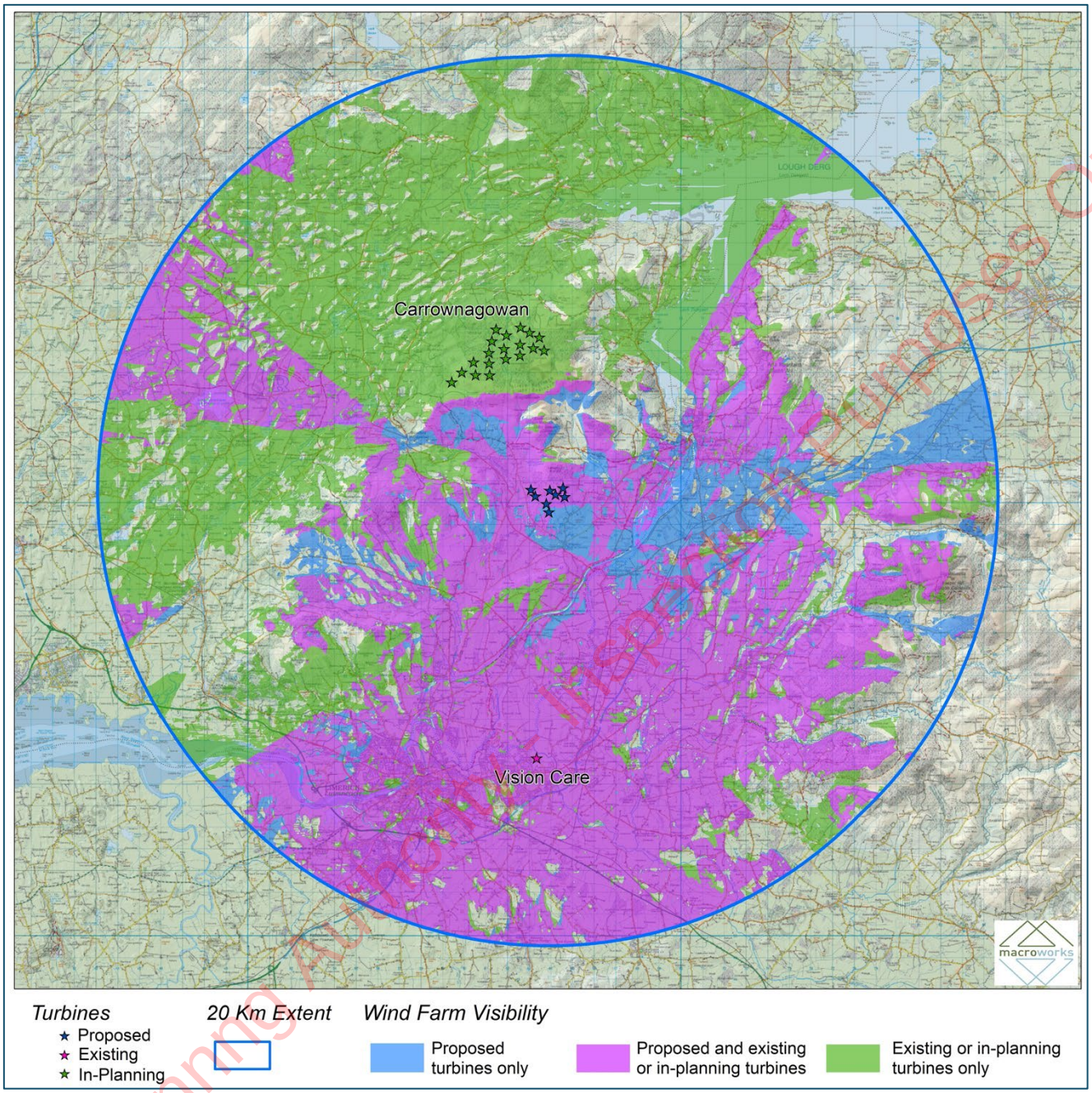

Figure 15-12: ZTV indicating the cumulative theoretical visibility of the proposed Fahy Beg Wind Farm in combination with all other wind farms in the study area.

A cumulative Zone of Theoretical Visibility (ZTV) map has been prepared for the wind energy developments contained within the study area and is included in Appendix 15.2 However, a small-scale version of this map can be seen above, at Figure 15-12.

The cumulative ZTV map indicates the following key points:

- Around three quarters of the study area has potential visibility of some wind energy development (76.2%) albeit dispersed over considerable distances.
- The vast majority of combined visibility with other developments occurs within the southern half of the study area and particularly within the lowlands around Limerick City and the foothills that contain the plains to the southeast and north. Given that this is also the area that the proposed development is most visible (based in the visual impact assessment in Section 15.8) it is reasonable to conclude that this combined visibility is in conjunction with the Vision Care turbine.
- The vast majority of the northern half of the study area has visibility of only existing / In-planning wind energy development and not the proposed Fahy Beg development. This relates to the Carrownagowan Wind Farm, which is separated from the other developments, in viewshed terms, by upland ridges.

15.11.5 Nature of Cumulative Impact

Using the 20 viewpoints from the visual impact assessment as a basis, the cumulative wind energy developments are included in the 90° wireline image in accordance with relevant guidance. Note that whilst there is some potential for cumulative turbines to be visible outside of the 90° viewing context of the proposed development, in this instance either the proposed or the cumulative development will be a distant background feature of the other and/or at a broadly disparate viewing angle where significant cumulative effects are very unlikely.

Of the 20 viewpoints only eight have any potential for any material cumulative visual effects and these include VP6, VP9, VP10. The nature of this cumulative visibility is set out in Table 15-9 below.

Table 15-9: Magnitude of Cumulative Impacts

VP No.	Nature of Cumulative Visibility
VP6	Three distant blade tips from Carrownagowan Wind Farm potentially visible above skyline ridge just to the left of the proposed turbines, but substantially screened by intervening vegetation.
VP9	One distant blade tip from Carrownagowan Wind Farm potentially visible above skyline ridge just to the left of the proposed turbines, but fully screened by intervening vegetation.
VP10	One distant blade tip from Carrownagowan Wind Farm potentially visible above skyline ridge on alignment the proposed turbines, but fully screened by intervening vegetation
VP11	Five very distant blade / partial blade sets from Carrownagowan Wind Farm potentially visible above skyline ridge to the left of the proposed turbines, but fully screened by intervening vegetation.
VP13	Six blades / partial blade sets from Carrownagowan Wind Farm will be visible above skyline ridge to the right of the proposed turbines, which are fully screened by intervening vegetation in this instance.

VP No.	Nature of Cumulative Visibility
VP15	Four blades / partial blade sets from Carrownagowan Wind Farm will be visible above skyline ridge considerably to the right of the proposed turbines. Minor cumulative visual impacts likely.
VP19	One very distant blade tip from Carrownagowan Wind Farm potentially visible above skyline ridge on alignment the proposed turbines. Likely to be barely discernible in this context.
VP20	One very distant blade tip from Carrownagowan Wind Farm potentially visible above skyline ridge on alignment the proposed turbines. Likely to be barely discernible in this context.

Based on the analysis set out in Table 15.8 there will be very little opportunity to view the proposed development in conjunction with the Carrownagowan Wind Farm, which belies the fact that they are only separated by around 6km. The general lack of intervisibility relates to the position of the proposed development on south facing slopes at the edge of an upland area that stretches to the north to incorporate the Slieve Bearnagh range upon which the Carrownagowan development is located. Most of the viewshed of the proposed development is across the plains to the south and it is substantially screened by elevated ridges to the north, which also separates the proposed development from Carrownagowan Wind Farm. Only from VP15 is there likely to be a relatively clear view of both developments at similar mid-range viewing distances, albeit separated by a reasonable viewing angle that includes higher peaks between the developments. There is also some potential to see turbines blades above the skyline ridge directly beyond the proposed development from VP19 and VP20, but the viewing distances to the Carrownagowan turbines is considerable and those blade tips are not likely to be distinctive or generate ambiguity in either view.

The single Vision Care turbine is not considered to generate any material cumulative impacts with the proposed development due to the separation distance of 10km coupled with the contextual variance. That is, the Vision Care turbine is contained in a peri-urban industrial area at the edge of Limerick City and the proposed development consists of multiple turbines within an upland rural context at considerable remove from Limerick City where intervisibility is also limited.

15.11.6 Cumulative Impact Summary

On the basis of the analysis provided above and the criteria set out in Table 15.7, the cumulative impact of the proposed development in conjunction with other wind energy developments within the study area is deemed to be **Low-negligible**.

15.12 Conclusion

This Landscape and Visual Impact Assessment has separately considered landscape effects, visual effects and cumulative effects in the context of relevant planning policy and a comprehensive baseline study of the 20km radius study area. The assessment is also based on the most relevant, best practice guidance documents for landscape and visual impact assessment of onshore wind farms in Ireland. Based on the findings of this assessment, which comprehensively assesses the proposed Turbine Range, the proposed Fahy Beg Wind Farm will result in noticeable landscape and visual change, particularly within its immediate context.

However, even these localised effects are not considered to be significant and will reduce rapidly with increased viewing distances and broader landscape context. Furthermore, it is not considered to generate significant cumulative impacts with other wind energy development that either exist or may potentially exist within the study area due to the modest number of developments / turbines and the separation distances and limited intervisibility with these other developments. This is the case irrespective of which turbine is selected within the limited Turbine Range.

Overall, it is considered that the proposed wind farm will not give rise to any significant landscape or visual impacts.

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