MWP

Chapter 12 Landscape and Visual

Ballinlee Wind Farm

Ballinlee Green Energy Ltd.

September 2025

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Appendices

Appendix 12 A – Visual impact assessment at each of the 22 selected representative viewpoint locations

Appendix 12 B - Zone of Theoretical Visibility (ZTV) maps

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
22635	6006	A	22/09/2025	RB	CD	A O'C	Final

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12. Landscape and Visual

12.1 Introduction

This chapter considers the likely significant effects of the proposed wind farm on the landscape and visual resource in the area arising from the Proposed Development. A full description of the Proposed Development, development lands and all associated project elements is provided in Volume II, Chapter 02 Description of the Proposed Development of this EIAR. The nature and probability of effects on the landscape and visual resource in the area arising from the overall project has been assessed. The assessment comprises:

- A review of the existing receiving environment;
- Assessment and characterisation of likely impacts;
- Evaluation of effects significance; and
- Consideration of mitigation measures, where appropriate.

12.1.1 Competency of Assessor

This Landscape and Visual Impact Assessment (LVIA) was prepared by Richard Barker, Divisional Director and Landscape Architect at Macro Works Ltd (part of APEM Group), in Cherrywood, Dublin. Richard is a corporate member of the Irish Landscape Institute (ILI) and has undertaken LVIA work for over 100 wind farms amongst numerous other large scale infrastructure development projects in Ireland over the past 20 years. He has also presented conference papers and webinars on the topic of LVIA to the ILI with a particular focus on wind energy development. The LVIA was reviewed by Cian Doughan, Associate Director in Macro Works.

Macro Works is a specialist LVIA company with over 25 years of experience in the appraisal of effects from a variety of energy, infrastructure and commercial developments. Macro Works' relevant experience includes LVIA work on over 200 onshore wind farm proposals throughout Ireland, including more than 25 Strategic Infrastructure Development (SID) wind farms. Macro Works and its senior staff members are affiliated with the ILI.

12.1.2 Legislation

Ireland has signed up to the European Landscape Convention (ELC), which defines landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000). The definition of landscape applies to all types of rural landscape, marine and coastal landscapes (seascapes) as well as the townscape of villages, towns and cities (Section 2.5, LI, IEMA, 2013).

This Landscape and Visual Impact Assessment has been prepared in accordance with the following legislation and guidance documents;

- Planning and Development Act 2000, as amended;
- Planning and Development Regulations 2001, as amended;
- Irish Planning and Development Act 2024, as amended;

- European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU);
- Environmental Protection Agency (EPA) (2022) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022);
- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment – Third Addition (2013);
- NatureScot (2021) Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments. [online];
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006);
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2019 draft);
- Scottish Natural Heritage Visual Representation of Wind Farms: Best Practice Guidelines (version 2.2 - 2017);
- Limerick Development Plan (2022-2028);
- Cork County Development Plan (2022-2028); and
- Tipperary County Development Plan (2022-2028).

12.2 Methodology

12.2.1 Desktop Study

The methodology used for this study included desk-based research and site visits to assemble information on the local receiving environment. The desk study included the following activities:

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

12.2.2 Fieldwork

- Macro Works undertook fieldwork in August 2024, which consisted of visits to viewpoint locations and throughout the Study Area generally in order to gain a baseline understanding of landscape context and to interrogate the ZTV map.

12.2.3 Landscape and Visual Assessment

The process adopted in regard to the identification of landscape and visual effects (adopting the assessment criteria in Sections 12.2.5 and 12.2.6 respectively) is summarised as follows:

- Selection of a refined set of representative viewpoints for assessment (in accordance with guidelines and best practice).
- Consideration of the receiving landscape with regard to overall landscape character as well as the salient features of the Study Area including landform, drainage, vegetation, land use and landscape designations.
- Consideration of the visual environment including receptor locations such as centres of population and houses, transport routes, public amenities and facilities and designated and recognised views of scenic value.
- Consideration of design guidance and planning policies.
- Consideration of potentially significant construction, operational, and decommissioning stage 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 (Volume IV Photomontage).
- Assessment of cumulative landscape and visual effects in combination with other surrounding developments that are either existing, permitted or in-planning.

12.2.4 Guidelines and Best Practice

This LVIA uses a methodology that is in accordance with that prescribed within the following guidance documents:

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022);
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment – Third Edition (2013) (GLVIA3);
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006) and Draft Revised Wind Energy Development Guidelines (2019);
- NatureScot: Assessing the cumulative landscape and visual impact of onshore wind energy developments (2021);
- Scottish Natural Heritage (SNH) Visual representation of wind farms: Best Practice Guidelines (version 2.2 - 2017); and
- Landscape Institute Technical Guidance Note (TGN) 06/19 Visual Representation of development proposals (2019).

The above guidance is widely recognised and used by landscape professionals in undertaking LVIA work in Ireland and is considered to represent best practice in the absence of country-specific LVIA and visualisation guidance/standards.

12.2.5 Study Area

The Wind Energy Development Guidelines published by the Department of the Environment, Heritage and Local Government (DOEHLG) (2006/2019 revision) (WEDG) specify different radii for examining the zone of theoretical

visibility of proposed wind farm projects (ZTV). The extent of this search area is influenced by turbine height, as follows:

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

In the case of this project, the blade tips are proposed to be 160m high (one turbine150m high) and therefore the minimum ZTV radius recommended is 20km from the outermost turbines of the scheme. It is considered that there are no sites of national or international importance within 25km of the outermost turbines of the Proposed Development and thus, the radius of the Study Area will remain at 20km (see **Figure 12-1**). Impacts pertaining to other aspects of the Proposed Development such as the grid connection route, and turbine delivery route, are localised to the immediate environment, and as such the consideration of impacts focuses on the immediate landscape context within approximately 500m based on guidance and professional judgement. These areas predominantly fall within the principal 20km Study Area.

The Study Area adopted is in accordance with the WEDG and is consistent with study areas employed for comparable wind energy planning applications throughout Ireland. It is considered a robust area on which to structure the LVIA, whilst being proportionate to the potential significant effects.

Notwithstanding the full extent of the LVIA Study Area, there will be a particular focus on receptors and effects within the Central Study Area where there is a higher potential for significant impacts to occur. When referenced within this assessment, the 'Central Study Area' is the landscape within 5km of the Site. The remainder of the Study Area beyond 5km to the 20km outer limit is referred to as the 'Wider Study Area'. Relevant guidance does not require a Central Study Area, or Wider Study Area to be defined, but it has become standard / best practice to highlight the distinction between the immediate context of the Site, the context of the landscape within the local vicinity of the turbines, and then the context of the wider landscape.

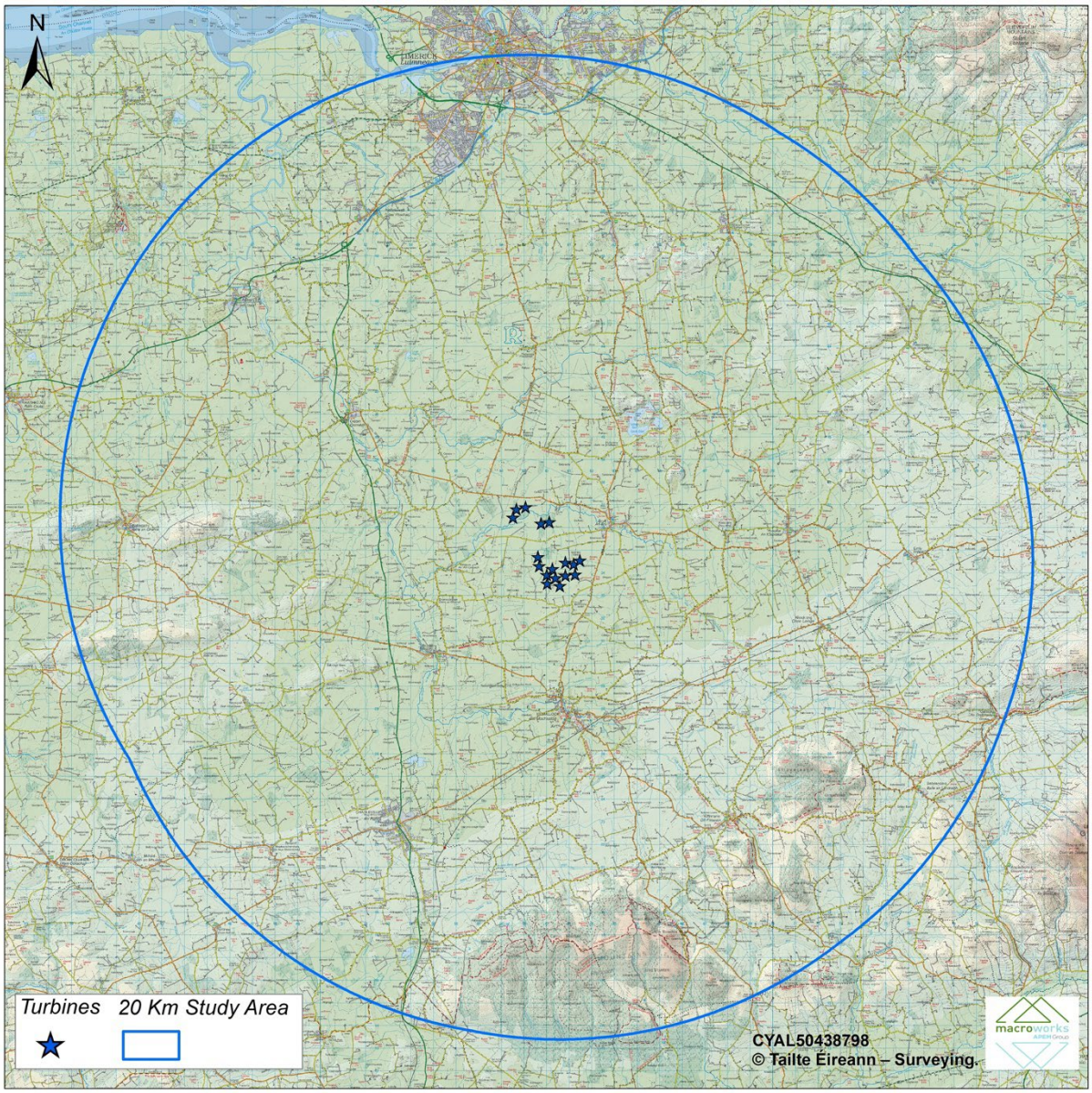

Figure 12-1: Study Area

12.2.6 Scope of Assessment

Table 12-1 outlines the issues which the EPA guidance documents suggest may be examined as part of the Landscape and Visual Impact Assessment.

Table 12-1: Issues relevant to Landscape and Visual

Topic Area	Potential Issues
Landscape Appearance and Character	Change to the salient appearance and character of the landscape contained within the study area
Landscape Context	Physical changes to landform, land cover and landscape features that may contribute to a loss of characteristic landscape elements or the introduction of uncharacteristic elements.

Topic Area	Potential Issues
Historical Landscapes	Change to the salient appearance and character of Historical Landscape settings within the Study Area (See Cultural Heritage Assessment)
Views & Prospects	Changes to views that could impact on the visual amenity of visual receptors (people involved in particular activities or resident at particular locations)

Accordingly, the scope of this assessment is made with respect to these topic areas and considers the effects of the construction, operation and decommissioning of the Proposed Development.

12.2.7 Assessment Criteria

Determination of the significance of an effect (see Sections 12.4 and 12.5) will be made in close accordance with the terminology outlined in the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2022) (as set out in Table 12-2). The only variation will be the use of best practice LVIA significance criteria / terminology for the significance of effect which avoids the use of the potentially confusing *'Not significant' category between 'Imperceptible' and 'Slight' effects and substitutes the term 'Substantial' for **'Significant', albeit noting that effects of 'Substantial' and above are deemed to be significant effects in EIA terms.

Table 12-2: Impact Assessment Criteria

	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative /adverse	A change which reduces the quality of the environment
Significance of Effects	Imperceptible	An effect capable of measurement but without significant consequence
	*Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
	**Significant	An effect which, by its character, magnitude duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude duration or intensity alters most of a sensitive aspect of the environment
	Profound	An impact which obliterates sensitive characteristics
Duration of Effect	Momentary	Effects lasting from seconds to minutes
	Brief	Effects lasting less than a day
	Temporary	Effects lasting less than a year
	Short-term	Effects lasting one to seven years
	Medium-term	Effects lasting seven to fifteen years
	Long-term	Effects lasting fifteen to sixty years

	Term	Description
	Permanent	Effects lasting over sixty years
	Reversible	Effects than can be undone e.g. through remediation or restoration
	Frequency	How often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Types of Effects	Indirect	Impacts on the environment, which are not a direct result of the project, often produced away from the project Site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create a larger, more significant effect.
	'Do Nothing'	The environment as it would be in the future should the subject project not be carried out.
	'Worst case'	The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable	When the full consequences of a change in the environment cannot be described.
	Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

Source: EPA Guidelines (2022) on Information to be contained in Environmental Impact Assessment Reports (2022)

In the case of commercial wind energy developments and the associated introduction of new moving structures within rural and upland areas, the quality of the landscape and visual effects will almost always be adverse, rather than positive or even neutral. Unless otherwise stated, the quality of the landscape and visual effect judgements herein can be taken as adverse.

In terms of duration, the proposed turbines will have a long-term impact, as permission is being sought for a 35 year period after which the turbines will be decommissioned. Some other elements of the Proposed Development relating to residually useful access tracks and elements of the Substation and grid connection will remain in perpetuity by necessity and will therefore have Permanent effects.

12.2.7.1 Assessment Criteria for Landscape Effects

The classification system used by Macro Works to determine the significance of landscape and visual impacts is in accordance with GLVIA3. When assessing the potential impacts on the landscape resulting from a wind farm development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape effects.

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 on its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria:

Table 12-3: Landscape Value and Sensitivity

Criteria	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 Site Boundary that may have an effect on the landscape character of the area.

Table 12-4: Magnitude of Landscape Impacts

Criteria	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:

Table 12-5: Landscape Impact Significance Matrix

	Sensitivity of Receptor				
Scale/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 effects' in EIA terms. Substantial-moderate judgements are considered borderline significant.

12.2.7.2 Assessment Criteria for Visual Effects

As with the landscape impact, the visual impact of the Proposed Development 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.

12.2.7.2.1 *Visual Sensitivity*

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

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 criteria. Susceptibility criteria are extracted directly from the GLVIA3, 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 GLVIA3, visual receptors most susceptible to changes in views and visual amenity are:

- "*Residents at home*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened*".

"*Visual receptors that are less susceptible to changes in views and visual amenity include:*

- *People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life*".

Values typically associated the visual amenity

- 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 in 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 regularly and whether this is significant at the county or regional scale.
- 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 a special sense of wholeness and harmony at the viewing location.
- 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.

12.2.7.2.2 *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 Proposed Development 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, specifically being 'noticed' by viewers and contributing memorably to the experience of that view or location – positive or negatively. Instead, the 2018 Fáilte Ireland survey entitled 'Report on Visitor Awareness and Perceptions of the Irish Landscape' summarised results as below:

- *"The majority of visitors appear not to notice the majority of development – even very large and visually prominent structures such as wind turbines and powerlines*
- *It appears that there are significant divergences between what can be seen and what is noticed*
- *The majority of visitors expressed very limited desire to change developments that they do notice*
- *The visibility of developments of all types give rise to significantly less adverse effects on the impression of landscape than may often be assumed in the decision-making process*
- *The majority of visible development does not appear to have any adverse effects on the impression of the quality of the landscape"*

With specific regard to wind farms, the following is mentioned within the main report:

- "Visibility at Locations - Windfarms or Wind Turbines were visible from four locations, they were mentioned by visitors at one location – Cobh. At this site 11% of visitors mentioned noticing wind energy projects

- Visibility en-route to locations - Wind Energy projects were mapped as being visible en-route to six sites, they *were mentioned by less than 5% of all visitors."*

The purpose here is not to suggest that turbines are unlikely to be noticed, or inherently liked or disliked, but rather to highlight that the assessment of visual impact magnitude for wind turbines is more complex than just the degree to which turbines occupy a view. Furthermore, a clear and comprehensive view of a wind farm might be preferable in many instances to a partial, cluttered view of turbine components that are not so noticeable within a view. On the basis of these reasons, the visual amenity aspect of assessing impact magnitude is qualitative and considers such factors as the spatial arrangement of turbines both within the scheme and in relation to surrounding terrain and land cover. It also examines whether the project contributes positively to the existing qualities of the vista or results in distracting visual effects and disharmony.

It should be noted that as a result of this two-sided analysis, a high order visual presence can be moderated by a low level of effect on visual amenity and vice versa. Given that wind turbines do not represent significant bulk; visual impacts result almost entirely from visual 'intrusion' rather than visual 'obstruction' (the blocking of a view). The magnitude of visual impacts is classified in the following table derived from GLVIA3:

Table 12-6: Magnitude of Visual Impacts

Criteria	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual disorder or disharmony is also generated, strongly reducing the visual amenity of the scene.
High	The proposal 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 disorder or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene.
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual disorder or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity.
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 detract from, and may even enhance, the visual amenity of the scene.

12.2.7.2.3 *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 significance matrix in Table 12-5.

12.2.7.3 Assessment Criteria for Cumulative Effects

The WEDG references the need to assess the cumulative effects of the scheme (at 4.7.4, P41 of the 2019 revision) as including the "wind energy development and the grid connection and any other works which are ancillary to the development of the wind energy development" in order that the planning application addresses the

cumulative impacts of the whole project. Cumulative in this context relates the project as a whole and has been the approach adopted in the main assessment (as outlined in Section 12.2.2).

NatureScot's 'Guidance – Assessing the Cumulative Effects of Onshore Wind Farms' (2021) is considered a key reference with regard to cumulative landscape and visual impacts. GLVIA3 provides comparable guidance in relation to cumulative issues, whilst recognising that it is an emerging area of study.

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 subsequent consideration of cumulative impacts with other forms of notable development (existing, permitted or proposed).

In relation to cumulative landscape impacts, the NatureScot guidance states:

"Cumulative landscape impacts can change either the physical fabric or character of the landscape, or any special values attached to it. For example:

- *Cumulative impacts on the physical fabric of the landscape arise when two or more developments affect landscape components such as woodland, dykes, rural roads or hedgerows. Although this may not significantly affect the landscape character, the cumulative effect on these components may be significant – for example, where the last remnants of former shelterbelts are completely removed by two or more developments.*
- *Cumulative impacts on landscape character arise when two or more developments introduce new features into the landscape. In this way, they can change the landscape character to such an extent that they create a different landscape character type, in a similar way to large scale afforestation. That change need not be adverse; some derelict or degraded landscapes may be enhanced as a result of such a change in landscape character, especially where opportunities for new woodland planting, or peatland restoration are maximised, for example."*

In relation to cumulative visual impacts, the NatureScot guidance states:

Cumulative impacts on visual amenity can be caused by 'combined visibility' and/or 'sequential impacts':

- *Combined visibility occurs where the observer is able to see two or more developments from one viewpoint. Assessments should consider the combined effect of all wind farms which are (or would be) visible from relevant viewpoints. 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 impacts occur when the observer has to move to another viewpoint to see different developments. Sequential impacts should be assessed for travel along regularly-used routes like major roads, railway lines, ferry routes, popular paths, etc. The magnitude of sequential effects will be affected by speed of travel and distance between viewpoints'*

The WEDG (2006 / 2019 Draft Proposed) describes a cumulative effect as "*the perceived effect on the landscape of two or more wind energy developments visible from any one place*" and provides guidance as to the aesthetic effects of multiple turbine developments in various landscape contexts. It also requires that cumulative effects are represented using Zone of Theoretical Visibility maps that show other wind energy developments.

Based on both sets of guidance, 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 is a range of ways in which an additional wind farm might generate visual conflict and disharmony with 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 wind farm 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 12-7 provides Macro Works' criteria for assessing the magnitude of cumulative impacts. The approach adopted is informed by the NatureScot Guidelines (2021), GLVIA3 and established best practice for wind energy LVIA in Ireland. It adopts a Study Area that is consistent with the main assessment to retain a proportionate focus on the most notable effects.

Other wind energy developments are the most relevant type of development in a cumulative LVIA assessment given the comparable characteristics. In this regard, small and domestic-scale wind turbines are generally not considered relevant given their proportions and lack of potential to generate notable cumulative effects. A proportionate level of consideration is given to other forms of development that are considered to have the potential to significantly alter the cumulative landscape and visual baseline environment. Factors such as scale and proximity of a Proposed Development are important factors, in addition to the characteristics of the development in question. For example, one off housing developments or agricultural buildings etc. are not considered as based on experience and professional judgment, there is no potential for significant cumulative effects with the proposed development.

Table 12-7: Magnitude of Cumulative Impacts

Criteria	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.

Criteria	Description
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.

12.2.7.4 Scoped out from Further Assessment

Those landscape and visual receptors that have been scoped out of further assessment are those that fall outside of the Study Area and in the case of visual impacts it is also those receptors within the Study Area that fall outside of the Zone of Theoretical Visibility (ZTV) pattern (covered in due course).

12.2.8 Statement on Limitations and Difficulties Encountered

There were no limitations or difficulties encountered in the course of this LVIA.

12.3 Baseline Environment

12.3.1 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 Proposed Development 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). The relevant Development Plan (DP) covering the Site is the Limerick Development Plan (LDP) 2022-2028.

A description of the landscape context of the proposed wind farm Site and Study Area is provided below under the headings of landform and drainage, vegetation and land use, centres of population, transport routes and public amenities and facilities as well as the immediate Site context.

Additional descriptions of the landscape, as viewed from each of the selected viewpoints, are provided under the detailed assessments later using a similar structure. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e., places and transport routes from which viewers can potentially see the Proposed Development. The visual resource will be described in greater detail below. Figure 12-2 shows the Site in its landscape context and the immediate surroundings.

Figure 12-2: Site Landscape Context

12.3.1.1 Landform and Drainage

The landscape of both the Site and wider Study Area is predominantly flat to gently undulating lowland plains that is enveloped throughout the wider eastern, western and southern quarters by higher ground, most notably the Ballyhoura Mountains to the south and southeast. However, as mountains go, these are of a modest height rising to 528m above sea level (a.s.l) out of plains that are around 100m a.s.l. There are some small isolate hills in the northern portion of the Study Area including Tory Hill and the Hills surrounding Lough Gur. Nearer the site to the east is a small hill at Knockainey.

The main watercourse in the Central Study Area is the Morningstar River, which dissects the northern portion of the Site from east to west having emanated from the Ballyhoura range in the southeast of the Study Area and connection with the River Maigue, which runs north-south through the western half of the study areas having

also stemmed from the Ballyhoura range. The River Shannon briefly touches the northern perimeter of the Study Area at Limerick City.

12.3.1.2 Vegetation and Land use

The predominant land use of the Study Area, by far, is agricultural farmland, which is the same for the Site itself. Just like the immediate surrounds of the Site which also contains small patches of coniferous forestry, there are commercial forests throughout the Study Area with concentrated areas in the Ballyhoura uplands to the south and southeast. Here, forestry is the dominant land use interspersed with marginal farmland.

There are occasional patches of woodland and linear riparian woodland following the river and stream corridors within the Study Area. In terms of continuous urban land cover, only Limerick City has notable coverage.

There are several wind farms within the upland areas to the south, west and southeast including four separate pairs of wind turbines, but these lie outside of the main concentration of turbines within the Ballyhoura range consisting of the Buttevant and Castlepook Wind Farms.

12.3.2 Landscape Policy Context and Designations

12.3.2.1 The Department of Environment, Heritage and Local Government Wind Energy Development Guidelines (2006/2019 revision)

In December 2019 the Department of Housing, Planning and Local Government issued the Draft Revised Wind Energy Development Guidelines, which will be refined through the consultation process, before being adopted to supersede the 2006 Wind Energy Development Guidelines. The Draft Revised Wind Energy Development Guidelines (2019) provide guidance on wind farm siting and design criteria for a number of different landscape types. The Site of the Proposed Development is located within a landscape that is consistent with the 'Hilly and Flat Farmland' landscape type in terms of its flat agricultural fields of improved grassland and forestry.

12.3.2.1.1 *Hilly and Flat Farmland Landscapes*

Location

"*Location on ridges and plateaux is preferred, not only to maximise exposure, but also to ensure a reasonable distance from dwellings. Sufficient distance should be maintained from farmsteads, houses and centres of population in order to ensure that wind energy developments do not visually dominate them. Elevated locations are also more likely to achieve optimum aesthetic effect. Turbines perceived as being in close proximity to, or overlapping other landscape elements, such as buildings, roads and power or telegraph poles and lines may result in visual clutter and confusion. While in practice this can be tolerated, in highly sensitive landscapes every attempt should be made to avoid it*."

Spatial extent

"*This can be expected to be quite limited in response to the scale of fields and such topographic features as hills and knolls. Sufficient distance from buildings, most likely to be critical at lower elevations, must be established in order to avoid dominance by the wind energy development*."

Spacing

"*The optimum spacing pattern is likely to be regular, responding to the underlying field pattern. The fields comprising the Site might provide the structure for spacing of turbines. However, this may not always be the case*

and a balance will have to be struck between adequate spacing to achieve operability and a correspondence to field pattern."

Layout

"*The optimum layout is linear, and staggered linear on ridges (which are elongated) and hilltops (which are peaked), but a clustered layout would also be appropriate on a hilltop. Where a wind energy development is functionally possible on a flat landscape a grid layout would be aesthetically acceptable*."

Height

"*Turbines should relate in terms of scale to landscape elements and will therefore tend not to be tall. However, an exception to this would be where they are on a high ridge or hilltop of relatively large scale. The more undulating the topography the greater the acceptability of an uneven profile, provided it does not result in significant visual confusion and conflict*."

Cumulative

"*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*."

Setback

Section 6.18 of the 2019 Draft Revised Guidelines refers to "*siting in relation to individual properties*," which is known as "setback." This is understood to be the only change to the 2006 guidelines that is of potential landsape and visual relevance to the Proposed Development.

It is worth noting that the Draft Revised Guidelines 2019 are not yet adopted. However, the 4x tip height setbacks from existing sensitive receptors as required in the 2019 draft revised guidelines, have been applied in this instance 640m / 600m (4 x 160m tip height, 1 x 150m tip height). All existing residential properties in the area align with this.

12.3.2.2 Limerick Development Plan (LDP) 2022-2028

12.3.2.2.1 ***Landscape Designations***

The Limerick Development Plan contains a Landscape Character Assessment in section 6.4 of the LDP which identifies 10 geographically specific landscape areas (refer **Section 12.3**). The proposed wind development is contained within the 'Agricultural Lowlands' Landscape Character Area.

The 'LCA 01 Agricultural Lowlands' are described as;

"the largest of the Landscape Character Areas in Limerick and comprises almost the entire central plain. This landscape is a farming landscape and is defined by a series of regular field boundaries, often allowed to grow to maturity. This well-developed hedgerow system is one of its main characteristics. In terms of topography, the landscape is generally rather flat with some locally prominent hills and ridges. The pastoral nature of the landscape is reinforced by the presence of farmyards."

The current LDP includes specific landscape objectives for the 'LCA 01 Agricultural Lowlands':

- *"Encourage retention of existing landscape features such as hedgerows and trees and their incorporation into landscaping for new developments."*
- *"Discourage development of locally prominent sites."*

- *"Encourage the regular arrangement of turbines with equal spacing in proposed wind farm developments, which take field boundaries into account."*

Several other Limerick LCA's are located within the Study Area, these are outlined below;

- *'LCA 02 Ballyhoura / Slieve Reagh' to c. 6km south of the Proposed Development.*
- *'LCA 04 Knockfierna' is located approximately c.12km from the Site to the west.*
- *'LCA 09 Tory Hill' is located c.6km to the northwest.*
- *'LCA 05 Lough Gur' located 3.5km to the northeast of the Site*
- *'LCA 06 Shannon ICZM' located 13km north of the Site*
- *'LCA 12 Southern Environs' of Limerick City located 14.5km north of the Site*

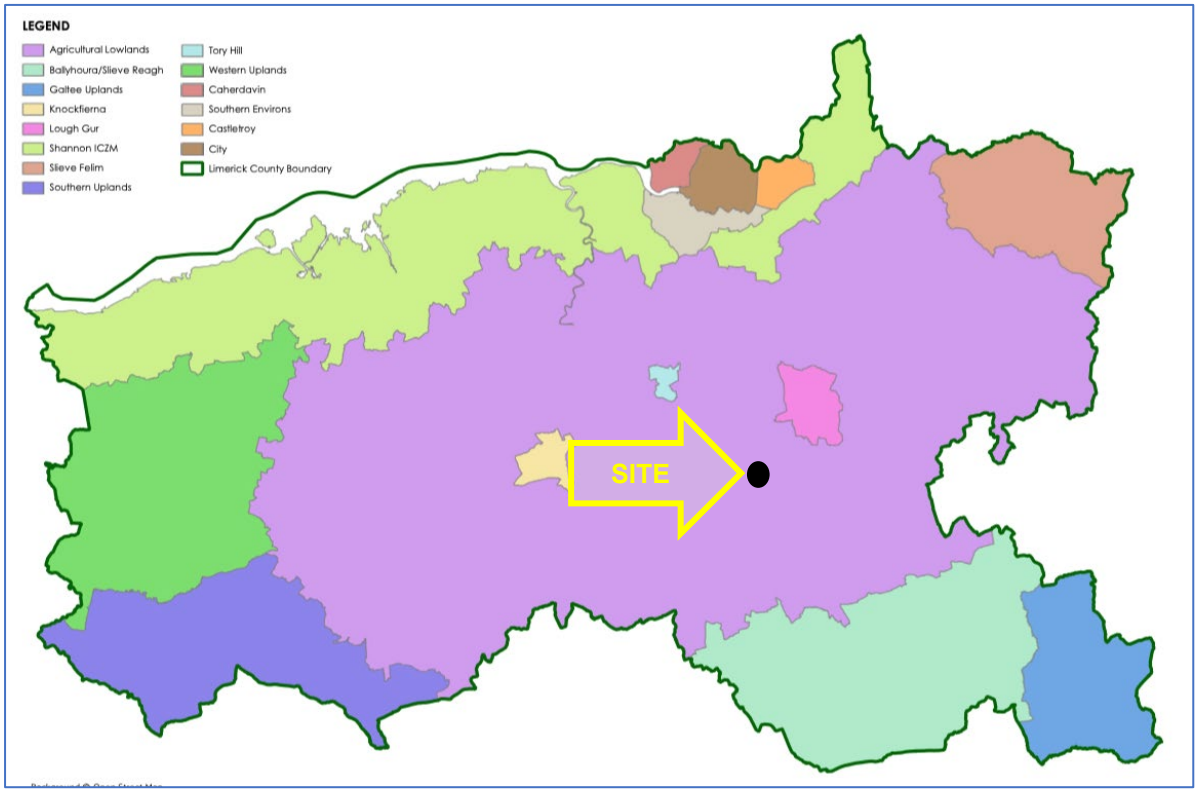

Figure 12-3: Excerpt from Limerick DP Landscape Characterisation Map

12.3.2.2.2 *Scenic Designations*

There are no immediate views and prospects directly towards the Site. The closest view to the Site is the Lough Gur view, located approximately 4.6 km northeast of the Site. Other notable scenic views include:

- The view from local roads in the vicinity of Tory Hill, approximately 7 km northwest of the Site.
- The Kilfinane Scenic Drive view, approximately 13.2 km southeast of the Site.
- The Castleoliver Scenic Drive view, approximately 12.6 km southeast of the Site.

Relevant scenic designation objectives include Objective EH O31 Views and Prospects:

"*It is an objective of the Council to*:

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

Significant views and landmarks within the Study Area, close to Limerick City include:

- Shannon Estuary – Loch Luimnagh Estuary (Approximately 19.9km northwest)
- Ballyneety, Co. Limerick (Approximately 13.4km northeast)

There are no open views of the Site, and the direction of these views is in the opposite direction to the proposed development.

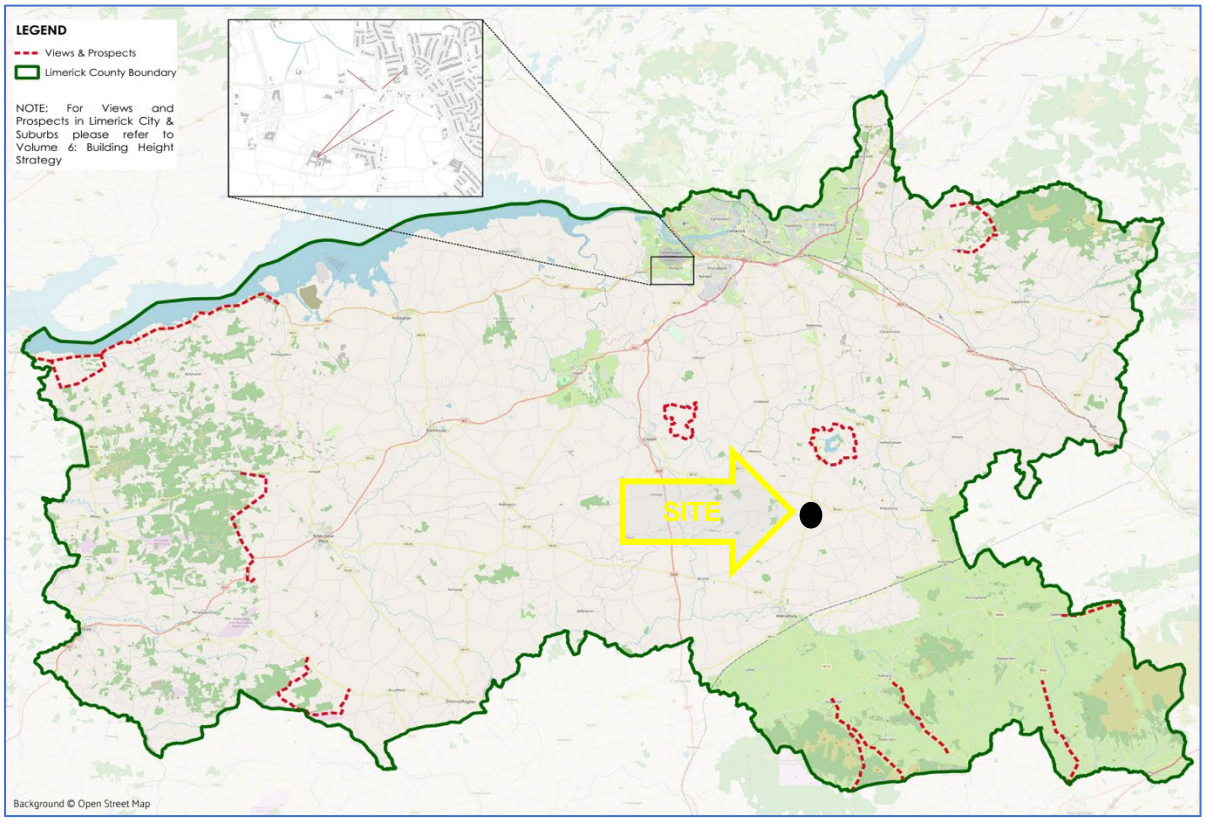

Figure 12-4: Excerpt from Limerick DP Scenic Views and Prospects Map

12.3.2.2.3 *Wind Energy Strategy*

A Wind Energy Strategy is included in subsection 9.4.4 of the LDP. Regarding wind energy in Limerick, the LDP states;

> *"The Council will continue to support and encourage the principle of wind energy development in accordance with Government policy and having regard to the Wind Energy Development Guidelines for Planning Authorities, or any update made thereto during the lifetime of the Plan, subject to the*

location and siting of such infrastructure and having regard to the extensive designations throughout Limerick in terms of Natura 2000 sites."

Within the Wind Energy Strategy for Limerick, the DP has taken the Landscape Character Assessment and used it to identify 'Preferred Areas', 'Areas Open for Consideration' and 'Areas Unsuitable' for wind energy development (refer Figure 12-5). As can be seen below the Proposed Development is located within a 'Preferred Area' for wind energy.

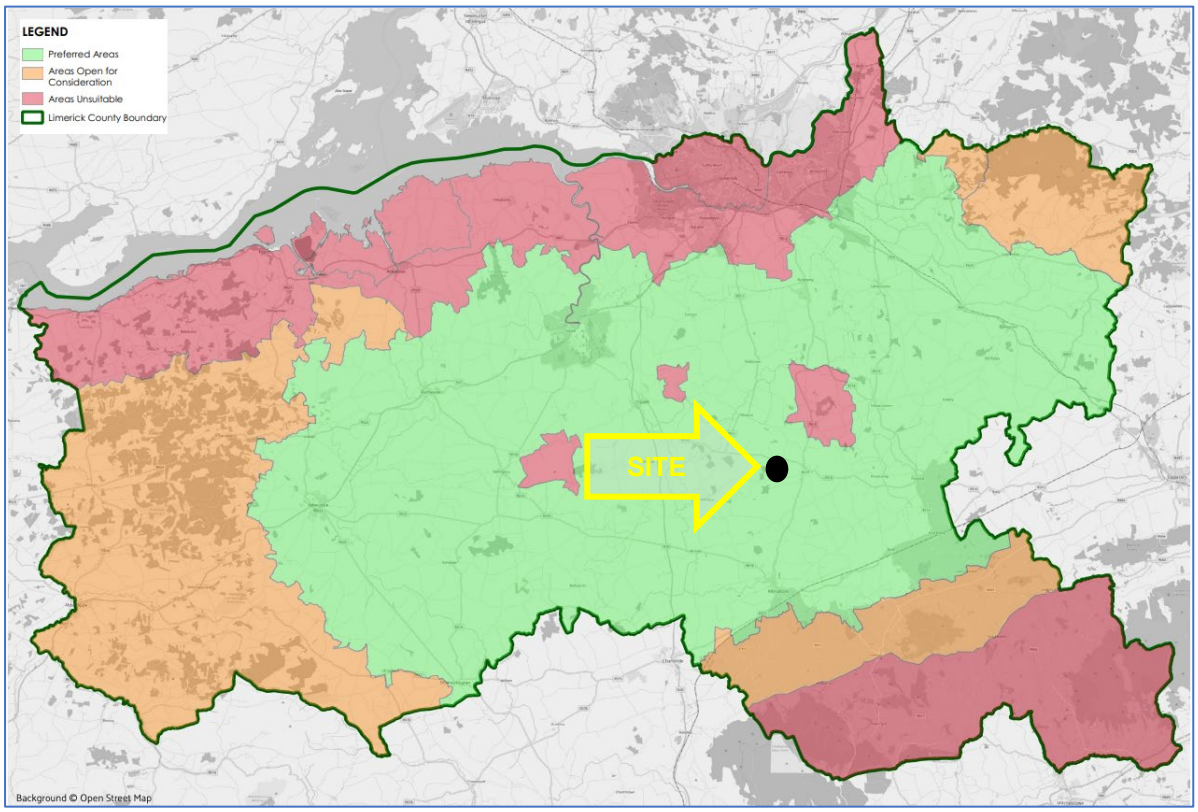

Figure 12-5: Excerpt from Limerick DP Wind Energy Strategy map

Relevant Policies from the Wind Energy Strategy:

"It is a policy of the Council to support renewable energy commitments outlined in national and regional policy, by facilitating the development and exploitation of a range of renewable energy sources at suitable locations throughout Limerick, where such development does not have a negative impact on the surrounding environment landscape, biodiversity, water quality or local amenities, to ensure the long-term sustainable growth of Limerick."

12.3.2.2.4 *Landscape and Wind Energy Policies of Surrounding Counties*

Whilst the Proposed Development is wholly contained within County Limerick, there are two other counties contained within the Wider Study Area (between 5km and 20km from the Site) These include;

- County Cork (9.5km southwest)
- County Tipperary (11km east)

Although the proposed turbines might be visible from parts of these surrounding counties, given the distance and discrete landscape context, it is not considered that they will be more than a distant background feature in the context of the landscape character of even the nearest portions of these counties. They will, therefore, not

significantly influence salient landscape character and their landscape and wind energy policies are not of the same relevance as the host county, Limerick. Scenic designations and other sensitive visual receptors within the surrounding counties of the Study Area will be considered below as part of the visual baseline but, the landscape designations and wind energy strategies of surrounding counties will not be considered further.

12.3.3 Visual Baseline

12.3.3.1 Zone of Theoretical Visibility (ZTV)

Only those parts of the Study Area that potentially afford views of the Proposed Development are relevant to this part of the assessment. Therefore, the first part of the visual baseline is establishing a ZTV and subsequently, identifying visual receptors on which to base the visual impact assessment.

A computer-generated ZTV map has been prepared to illustrate where the Proposed Development is potentially visible. 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 nature of the topography in parts of the landscape, and the combined influence of successive layers of vegetation throughout the landscape, the main value of this form of ZTV mapping is to determine those areas from which the Proposed Development will not be visible, such as to retain a proportionate focus on locations where there is potential for visibility.

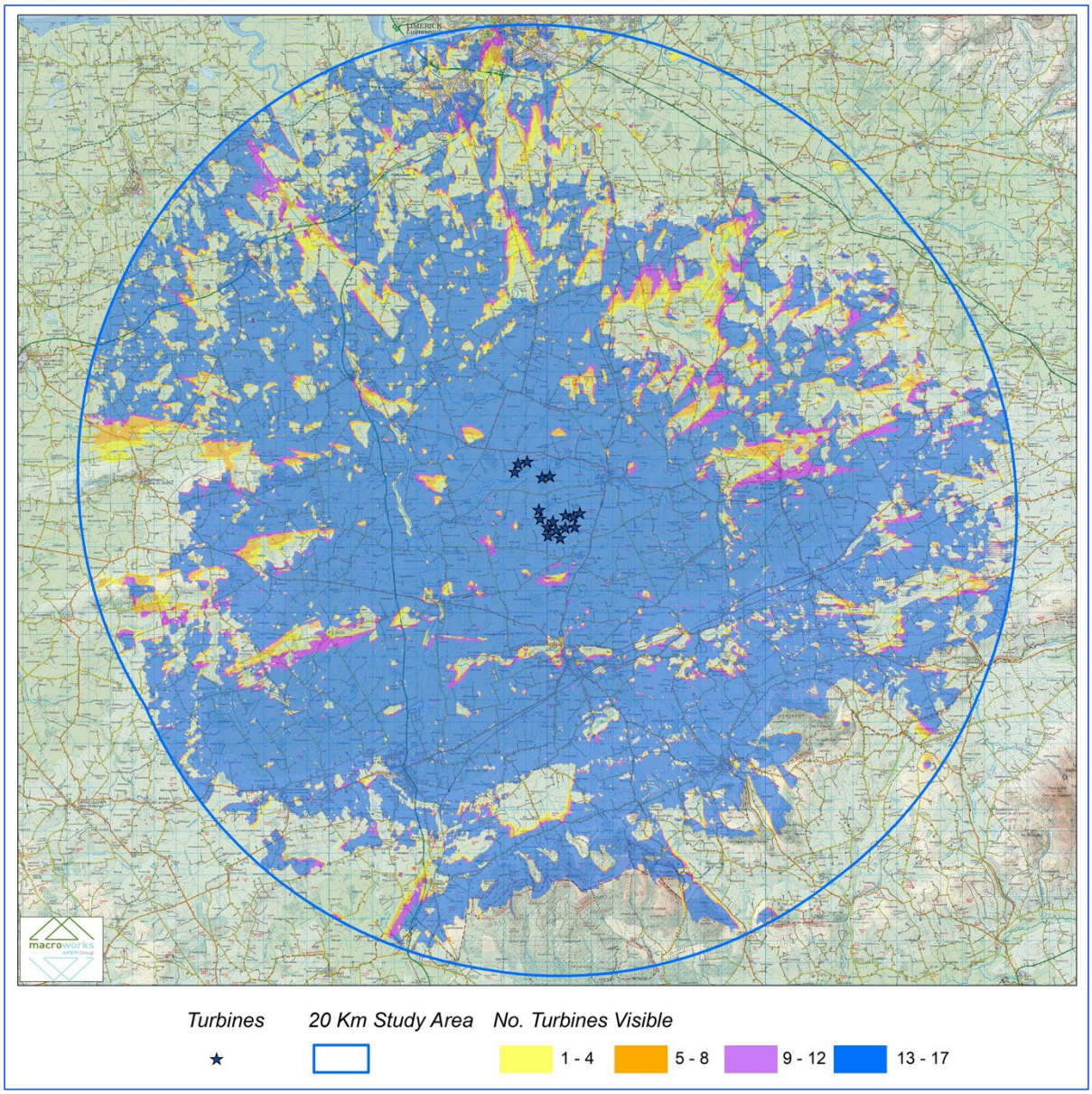

Figure 12-6: Zone of Theoretical Visibility Map (ZTV) – Tip Height

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

- There will be relatively comprehensive theoretical visibility within approximately 8km of the Site in all directions. Thereafter visibility tends to become sporadic throughout the northern quarters and particularly to the northeast beyond the Lough Gur Hills.
- Visibility extends to approximately 12 km to the south after which it encounters the Ballyhoura foothills. Thereafter the hills screen visibility from much of the Cork portion of the Study Area.
- There is very patchy visibility indicated around Limerick city and likewise along the corridor of the M20 / N21. Relatively comprehensive theoretical visibility is indicated for the N20 which runs to the west of the Site.
- Most settlements have potential for at least some visibility with several exceptions being Ballingarry, Patrickswell, and Caherconlish.

The most important point to reiterate with respect to this 'bare-ground' ZTV map is that it is theoretical. Any development, including wind energy developments, has the potential to be screened by intervening or surrounding vegetation (e.g., roadside hedgerows), as well as buildings, walls, and embankments in proximity to the viewer, resulting in a much lesser degree of actual visibility. For these reasons, the ZTV represents a worst-case scenario of what is already an entirely theoretical projection.

12.3.3.2 Route Screening Study

Whilst the standard ZTV map outlines baseline theoretical visibility within the Study Area, it grossly overestimates the actual degree of visibility and does not take existing hedgerows, woodland and forestry into account, which, in this case will offer a notable degree of screening in the direction of the Proposed Development.

Route Screening Analysis, as its name suggests, considers actual visibility of the proposed wind farm from surrounding roads using current imagery captured in the field, then subsequently reviewed in the context of a digital model of the project. Route Screening Analysis bridges the gap for the assessor between the computer generated, theoretical visibility modelling (e.g. ZTV maps) and the actual nature of visibility in a given area. To get a clearer understanding of visibility within the Central Study Area, Route Screening Analysis (RSA) was undertaken for every road within a 5km radius of the proposed turbines using a Digital Surface Model (DSM) and sample points every 25m along each road route. It is not deemed practicable or necessary to survey all roads within the 20km radius study area. The focussed 5km radius RSA study area accords with established best practice for wind energy RSA in Ireland.

The RSA consists of three visibility scenarios: open visibility; partial visibility; and fully screened. In this instance, 'open visibility' is conservatively judged to occur if the view of a full blade rotation of any one single turbine is afforded. 'Partial visibility' occurs when there is view of less than a full blade rotation of any particular turbine/s occurs. See **Figure 12-7** (RSA map) and **Figure 12-8** (RSA graph) for RSA results.

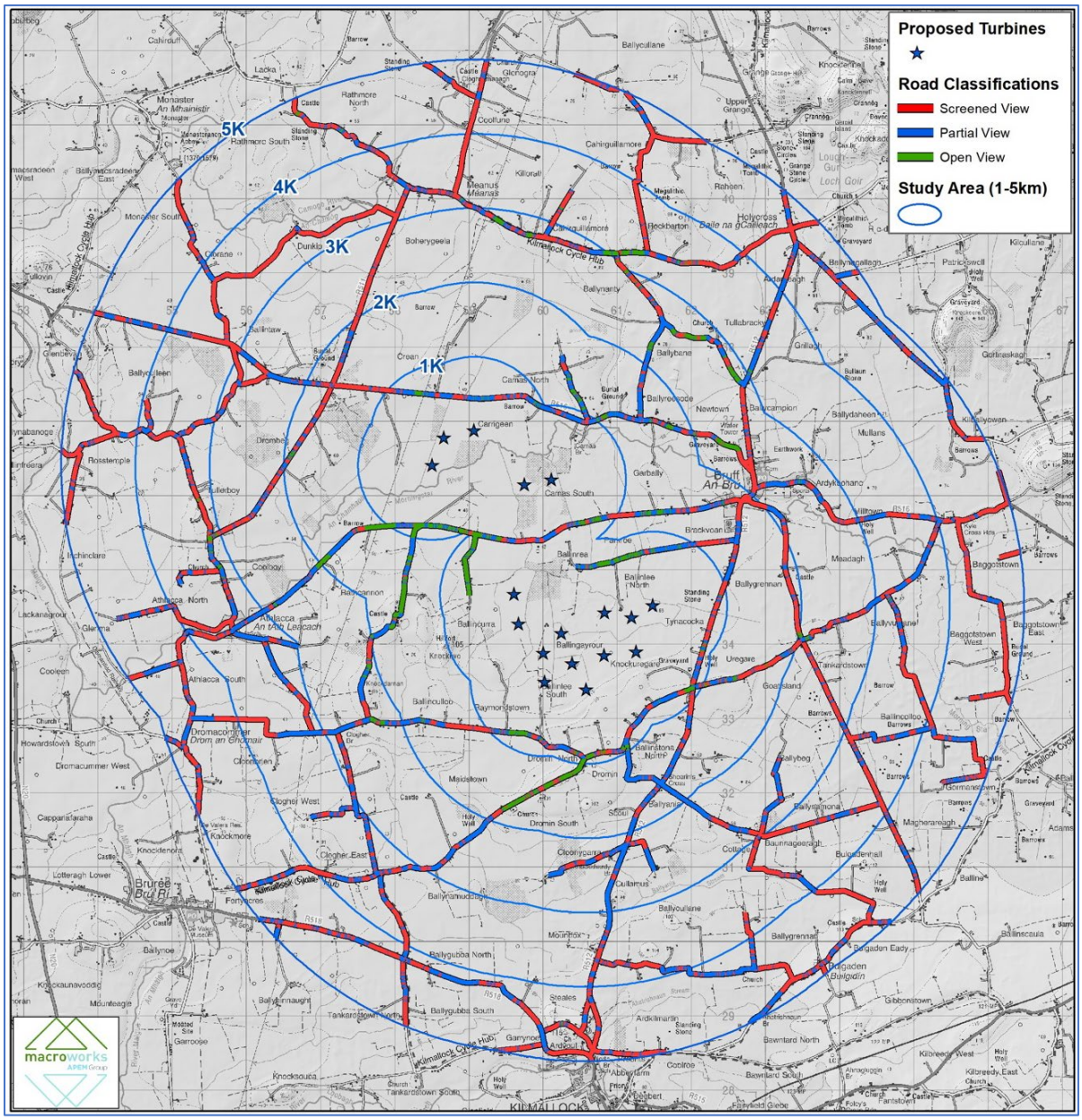

Figure 12-7: Route Screening Analysis (RSA) for public roads within 5km of nearest turbines

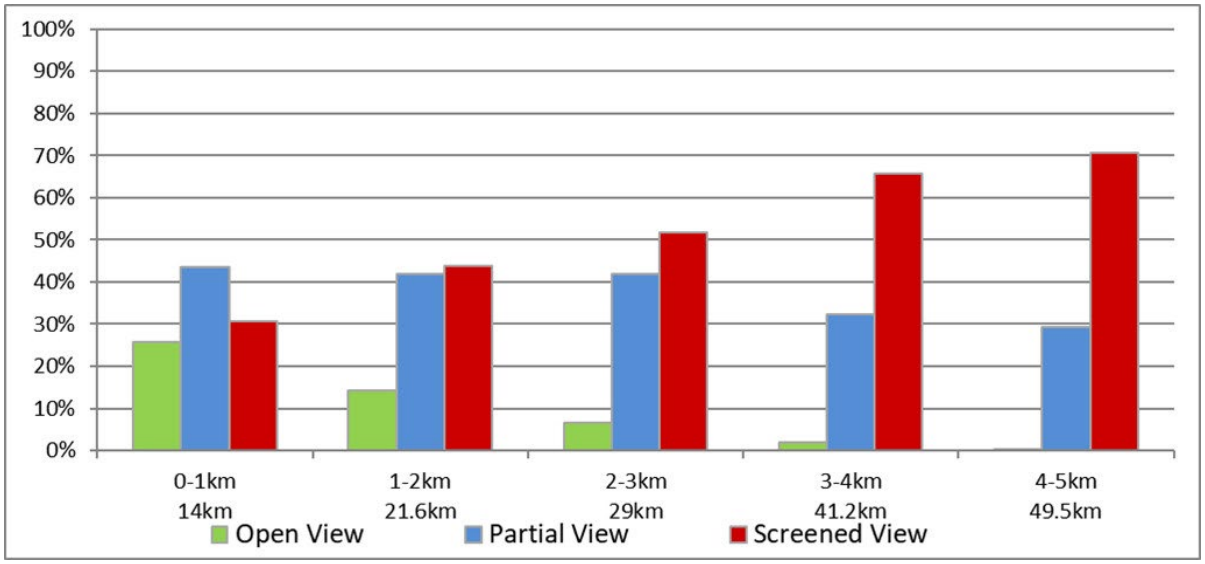

Figure 12-8: Route Screening Analysis (RSA) graph

The results indicated in Figure 12-7 and Figure 12-8 show that there is a clear inverse relationship between turbine visibility and distance, albeit dominated by fully screened views throughout all of the distance bands. Within 1km there is an even distribution between the three visibility categories with the highest proportion (43%) relating to partial visibility i.e. of less than one full blade set albeit this could relate to a number of partial blade sets. Between 1-2km full screening emerges marginally as the most likely scenario at 43% of road sections, but most notably, open visibility has nearly halved to 15% from 26% within 1km of the Site. This trend continues into the next distance band (2-3km) where open visibility reduces to 7% of road sections and full screening has increased to over 50% of road sections. By the 3-4km distance band there is only 2% open visibility and there is none registered between 4-5km from the roads within this vegetated lowland landscape.

Interestingly, partial visibility maintains a consistent proportion of road sections throughout the five distance bands fluctuating between 43% in the nearest 0-1km band and only reducing to 29% by the 4-5km distance band. This tends to indicate that the proposed turbine blades will rise just above a consistent intervening vegetated skyline that otherwise prevents full visibility of blade sets.

In terms of the distribution of open visibility, it mainly occurs from local roads to the south, north and northwest and generally within 2km. There is very little visibility shown within and around the settlements of Bruff and Kilmallock. There is also very little open visibility from the R512 regional road a short distance to the east of the Site.

The key point is that within a relatively short distance of less than 2km it will be difficult to obtain clear views of the proposed turbines within the vegetated lowland setting of the Central Study Area and this stands in stark contrast to the theoretical visibility indicated by the ZTV maps based on bare-ground terrain data.

12.3.3.2.1 *RSA Open Visibility Refinement*

Having established sections of the surrounding road network that have 'open visibility' of proposed turbines on the conservative basis of at least one blade set being visible, it is important to consider how many of the turbines might be openly visible. This is done by refining the open visibility sections into those where less than seven of the proposed turbines will be 'openly' visible, between 7 and 12 will be visible and finally, where more than 13 i.e. the majority of turbines will be openly visible. The results are shown in Figure 12-9 and Figure 12-10.

The results of the open visibility refinement show that from the vast majority of road sections that have an open view of at least one full blade set, there are few instances where more than seven out of the 17 turbines are openly visible. Interestingly, there are no instances of open visibility of more than 12 turbines within the nearest distance band of less than 1km and only 15% of road sections have open visibility of between 7 and 12 turbines.

Throughout the distance bands from 1km to 4km there is never more than 7% of road sections that have open visibility of the majority of turbines (>12) and there are none in the final distance band from 4-5km.

In terms of distribution, the most open views of the majority of turbines occurs from local roads to the south, north and northwest and generally within 2km. There is also open visibility from a small section of road to the northwest of Bruff and further north again on the Kilmallock Cycle Hub. These road sections occur between 1-3km from the nearest turbines.

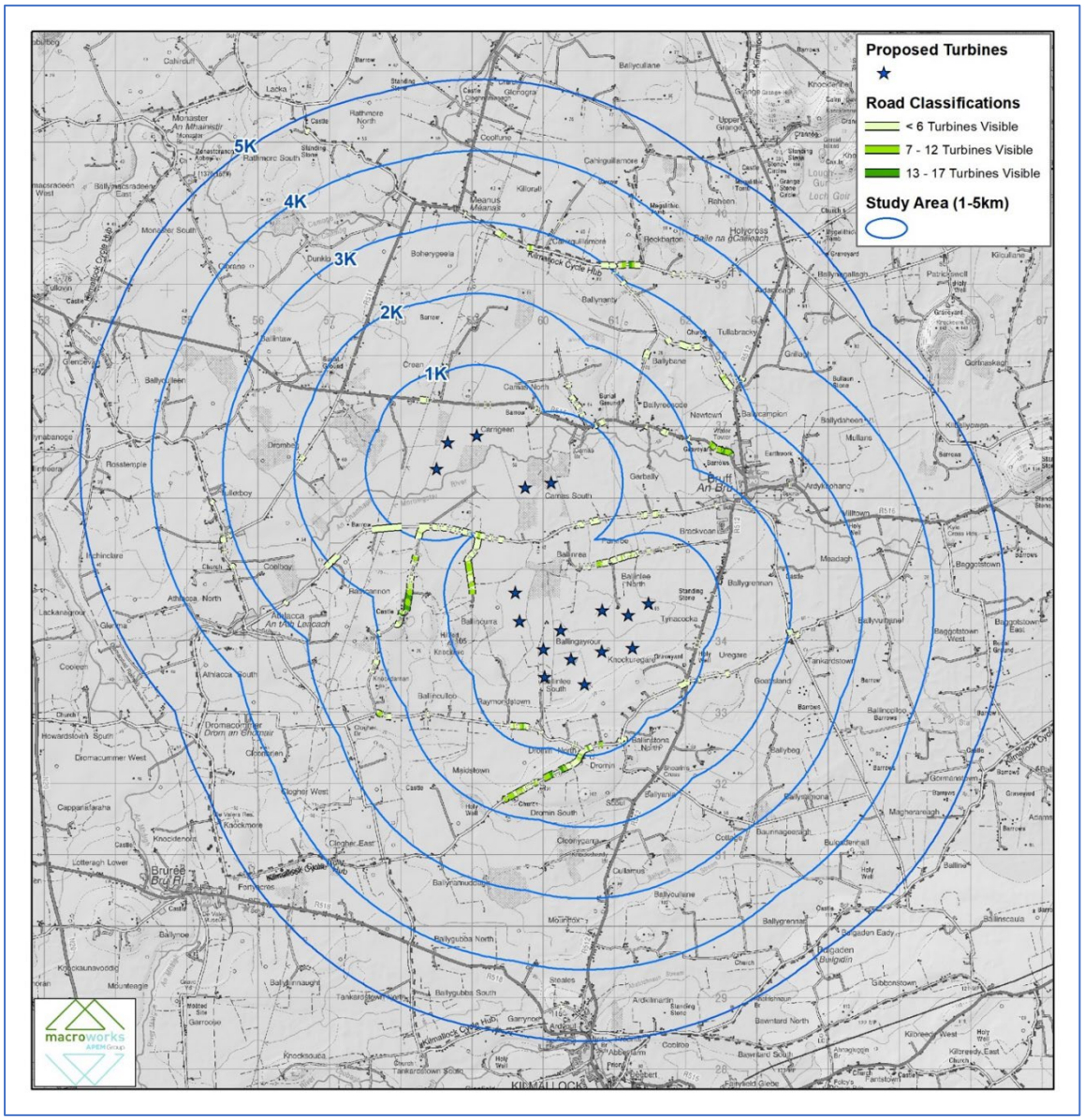

Figure 12-9: Route Screening Analysis (RSA) 'Open Visibility' refinement by number of turbines visible

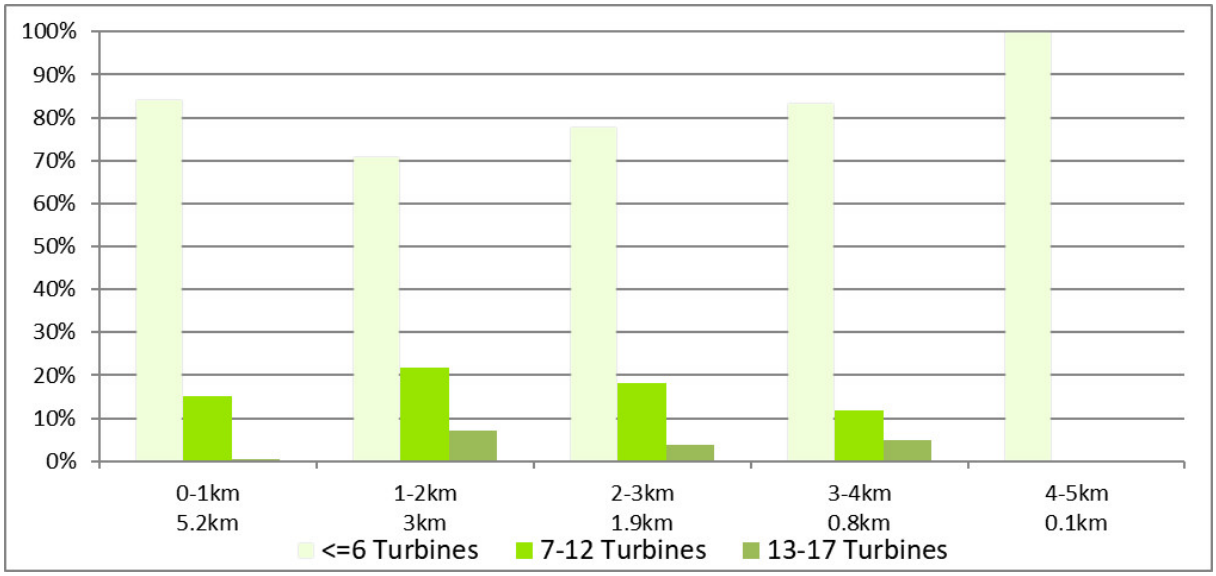

Figure 12-10: Route Screening Analysis (RSA) 'Open Visibility' refinement graph

12.3.3.3 Identification of Viewshed Reference Point (VRP or VP) as a basis for Visual Impact Assessment

The results of the ZTV analysis provide a basis for the selection of 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 every location that provides a view of the Proposed 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, in accordance with relevant guidance and best practice, 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) (KV);
- Designated Scenic Routes and Views (SR);
- Local Community views (LCV);
- Centres of Population (CP);
- Major Routes (MR); and
- Amenity and heritage features (AH).

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

Key Views

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

Designated Scenic Routes and Views

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

Local Community Views

This type of VRP represents those people who live and/or work in the locality of the Proposed Development, usually within a 5km 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 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 and/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 Site, but with a preference towards close and/or elevated views. Major routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

Tourism, Recreational and Heritage Features

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

12.3.3.4 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within County Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guidebooks, roadside rest stops or on postcards that represent the area. The relevant scenic designations (views, prospects, and scenic routes) contained in the Limerick Development Plan have been identified, and all of those that fall within the 20km Study Area have been identified in Table 12-8.

The number of these locations is numerous throughout the Study Area, and a critical analysis of these viewpoints was undertaken to determine their relevance to the assessment of visual effects. Where these fall outside the ZTV pattern, they have been discounted on the basis that the turbines have no potential to generate visual impacts. Those scenic designations that fall inside the ZTV pattern were investigated during fieldwork to determine whether actual views of the Proposed Development might be afforded. In some instances, the location offers limited potential for any visibility as a result of screening elements and is therefore not considered to be of relevance to the LVIA due to the absence of potential for significant effects. In other instances, the primary aspect of view (identified in the Limerick DP) of relevance to the scenic designation, orientates away from the proposed development. Where this is the case, the impact on the scenic view is not considered to be of primary relevance and visual effects are structured around other VRPs which are considered representative. Where visibility may occur and the location is considered helpful in understanding effects from parts of the landscape, a VRP has been selected for use in assessing visual impacts.

The analysis is presented in Table 12-8.

Table 12-8: Rational for selection of scenic designations contained within the Study Area

Scenic View or Route Reference (CDP):	Relevance to visual impact appraisal	Represented herein by VRP No.
Limerick DP 2022-2028		
The view from local roads in the vicinity of Lough Gur, approximately 4.6 km northwest of the Site	**Yes, Relevant**	VP17, VP18 and VP19
The view from local roads in the vicinity of Tory Hill, approximately 7 km northwest of the Site	**Yes, Relevant**	VP21
The Kilfinane Scenic Drive view, approximately 13.2 km southeast of the Site	**Yes, Relevant**	VP3
The Castleoliver Scenic Drive view, approximately 12.6 km southeast of the Site	**Yes, Relevant**	VP4
Cork CDP 2022-2028		
S13: Local Road from Craig Cross Roads to County Boundary, views of the Ballyhoura Mountains and the Awbeg Valley (19.6km southeast of the Site)	Not Relevant – outside of ZTV	-
Tipperary CDP 2022-2028		
V36- Views to the south and south-east from Shronell crossroads (R515)	Not Relevant Substantially outside of ZTV and study area	-

12.3.3.5 Centres of Population and Houses

Although the Study Area is predominantly rural in character, there are a number of notable settlements spread throughout with the largest by far being Limerick City, the southern outskirts of which are just inside the northern extent of the Study Area. The Central Study Area contains a series of small settlements with the largest being Kilmallock nearly 5km away. Notable settlements within the Study Area are set out below based on distance from Site;

Within 5km:

- Dromin – Approximately 900m south of the proposed Site
- Camas – Approximately 1.35km northeast of the proposed Site
- Bruff – Approximately 3km east to northeast of the proposed Site
- Kilmallock – Approximately 5.2km south of the proposed Site

Between 5 – 10km:

- Bruree – Approximately 5.5km southwest of the proposed Site
- Croom – Approximately 8.3km northwest of the proposed Site
- Hospital Village – Approximately 10.2km east of the proposed Site

Beyond 10km:

- Charleville – Approximately 12km southwest of the proposed Site
- Kilfinane – Approximately 12.4km southeast of the proposed Site
- Ballyneety – Approximately 13.26km northeast of the proposed Site
- Ballyagran – Approximately 14.1km southwest of the proposed Site
- Patrickswell – Approximately 14.3km northwest of the proposed Site
- Emly – Approximately 14.6km east of the proposed Site
- Adare – Approximately 14.8km northwest of the proposed Site
- Caherconlish – Approximately 15.1km northeast of the proposed Site
- Ballingarry – Approximately 16.9km west of the proposed Site
- Limerick City – Approximately 18km north of the proposed Site
- Croagh – Approximately 18.5km west of the proposed Site
- Pallasgreen – Approximately 19.1km northeast of the proposed Site

Outside of towns and villages, there is a reasonable concentration of rural dwellings and farm steads lining the local roads that crisscross the farmed and settled landscape of the Study Area.

12.3.3.6 Transport Routes

In terms of major routes within the Study Area there is one short section of motorway (the M20 heading south from Limerick City) and the N20 and N21 National routes. The closest of these to the Site is the N20 some 6km west at its nearest point, whilst the N21 is 13.5km northwest at its nearest point. The N24 national road is approximately 17.3km northeast of the proposed Site, but outside of ZTV coverage. The N69 is a similar distance away to the northwest and substantially outside of ZTV coverage. The M7 motorway along with the N18 national road form a southern ring road around Limerick City beyond 18km from the Site and both are substantially outside of ZTV pattern.

Other notable major roads that are relevant to the assessment due to traffic volume and / or proximity to the Site include the R516 Regional Road, which is approximately 430m north of the proposed Site at its nearest point. The R512 Regional Road is approximately 810m to the east of the proposed Site at its nearest point.

In addition to these national and regional routes, a network of local roads also criss-crosses the Study Area including several within 1km of the Site and one (the L1414) which passes between the northern and southern turbine arrays.

12.3.3.7 Tourism, Recreation and Heritage Features

The most notable recreational amenity feature within the Study Area is the Lough Gur complex of archaeological features. The Lough Gur complex is centred on a shallow, horseshoe shape at the base of Knockadoon Hill, with a lakeside visitor centre and car park. However, the largest stone circle in Ireland, and accompanying dolmen and the remains of Stone Age houses, is located to the north of the lake. Closer to the lake there is also a (Castle) Tower House and the ruins of a Norman Castle (Black Castle). The lake and the surrounding area is known to be one of Ireland's most important archaeological sites, with humans having lived here continuously since Neolithic times (i.e. the last 5000-6000 years).

Other tourism and amenities within the Central Study Area (within 5km) include:

- Soccer field - 1.52km northeast of the proposed Site
- Dromin Graveyard - 1.73km southwest of the proposed Site
- Ballygrennan Castle - 1.78km northeast of the proposed Site
- Old Cork Road Trail – 3.2km northeast of the proposed Site
- Dromin Athlacca GAA - 3.3km southwest of the proposed Site
- Athlacca Burial Ground - 3.6km southwest of the proposed Site
- Kilmallock Cycle Hub Route - 4.8km north of the proposed Site

Other tourism and amenities within the Wider Study Area (beyond 5km) include:

- Monaster 5.3km – northwest of the proposed Site
- Tory Hill view 6km – northwest of the proposed Site
- Bruree Mill 6km – southwest of the proposed Site
- Kilmallock Cycle Hub – 6.1km south of the proposed Site
- Croom riverside Walk – 8.5km northwest of the proposed Site
- Liskennet Wood – 10.5km west of the proposed Site
- Fanningstown Castle - 11.4km northwest of the proposed Site
- Castleoliver scenic drive - 13km southeast of the proposed Site
- Kilfinane Scenic Drive - 13.3km southeast of the proposed Site
- Knockcarron - Golden mile Loop - 13.5km southeast of the proposed Site
- Ballyhoura – Mountain bike trails and Mountrussel Loop - 14km south of the proposed Site
- Adare Manor 14.5km – northwest of the proposed Site
- Knockfierna Walking Trail - 15.1km west of the proposed Site
- Adare Heritage Centre - 15.3km northwest of the proposed Site

- Darby's bed loop - 17.3km southeast of the proposed Site
- Boher Loop – Approximately 18.3km northeast of the proposed Site
- Ballinruane Wood Loop - 19km southwest of the proposed Site
- Kilduff Castle – Approximately 19.9km northeast of the proposed Site

12.3.4 Selected Viewpoints

The VPs selected in this instance are set out in Table 12-9 and their location and orientation are shown on the VP Location Map on the index page of the photomontage booklet (Volume IV) as well as a 'thumbnail' map on each photomontage. They have all been selected based on the methodology and baseline presented herein and in accordance with relevant guidance and best practice.

Table 12-9: Outline Description of Selected Viewshed Reference Points (VRP)

VRP No.	Location	Distance to the nearest turbine (km)	Representative of	Direction of View
VP1	R513 at Hospital	9.3	CP, MR	W
VP2	R515 southwest of Elton	7.9	MR	NW
VP3	L1511 at Kilfinane	12.6	CP	NNW
VP4	R512 at Ardpatrick	12.6	CP, MR	NNW
VP5	N20 at Charleville	12.4	CP, MR	NNE
VP6	N20 at Harding Grove	6.4	MR	E
VP7	R518 at Bruree	5.4	CP, MR, LC	NE
VP8	R512 at Kilmallock	5.3	CP, MR	N
VP9	L1550 at Trinity Holywell	2.1	AH, LC	N
VP10	Dromin Graveyard	1.7	AH, LC	N
VP11	Local Road at Dromin North	0.8	LC	N
VP12	Local Road at Rathcannon	1.7	LC	N, E
VP13	L1414 at Rathcannon	1.1	LC	NE, SE
VP14	L1414 at Camas South	0.70	LC	N, S
VP15	R512 at Tynacocka	0.9	LC	W, NW
VP16	R512 at Bruff	1.9	CP, MR, LC	W, SW
VP17	Grange Stone Circle	5.2	AH, SV, LC	SW
VP18	Lough Gur Wedge Tomb	5.9	AH, SV, LC	SW
VP19	Lough Gur	6.9	AH, SV	SW

VRP No.	Location	Distance to the nearest turbine (km)	Representative of	Direction of View
VP20	L1412 at Cahirgillmore	2.7	LC	S
VP21	L1410 west of Monaster	6.6	SV	SE
VP22	Residential Road at Adare	15.0	AH, CP	SE

12.3.5 Sensitivity of the Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in GLVIA3, which are set out below and discussed relative to the proposed project Site and wider Study Area.

Central Study Area (<5km)

The Central Study Area is relatively homogenous in terms of its consistent gently rolling terrain and agricultural farmland land cover with occasional patches of commercial forestry. The Morningstar River corridor is a natural and scenic feature that passes through the Site and Drommin Church and graveyard is a notable heritage feature, but neither is particularly remarkable in terms of its contribution to the landscape character of the Central Study Area. Overall, it is a productive lowland landscape where the landscape is valued more for its productive capacity, pastoral aesthetic and contribution to the local rural economy and subsistence of rural livelihoods than for scenic of naturalistic qualities.

In terms of landscape designations, the Site is contained within the 'Agricultural Lowland's Landscape Character Area (LCA), which is relatively robust in policy terms reflecting its productive function. This is further reinforced by the Wind Energy Classification of 'Preferred Area' that coincides with the 'Agricultural Lowlands' LCA. There are no higher sensitivity landscape areas contained within the Central Study Area or any wind energy deployment areas that differ from the 'Preferred Area' designation. There are also no scenic designations contained within the Central Study Area.

For the reasons outlined above, it is considered that the sensitivity of the Central Study Area is no greater than Medium-low.

Wider Study Area (>5km)

In terms of the Wider Study Area, many of the points raised in relation to the Central Study Area are considered to remain relevant. Whilst it encompasses a range of landscape features and characteristics, the landscape remains a rural, working, inhabited landscape that is underpinned by typical rural land uses, and which displays extensive signs of human influence, including major road corridors such as the M7 Motorway and the N20 and N21 National routes, as well substantial settlements such as Charleville and part of the urban area of Limerick City.

The wider study area to the south contains the upland area and surrounding foothills of the Ballyhoura range, but this is not a distinctive mountainous area and is substantially contained in coniferous plantation forestry.

Again, much of this wider landscape is contained in the robust 'Agricultural Lowlands' LCA, which is a 'Preferred Area' for wind energy development. The key exceptions are separate and more sensitive LCAs associated with the Lough Gur archaeological complex around 6km to the northeast and Tory Hill a similar distance to the northwest. Both of these LCAs are also circumnavigated by designated scenic routes and classified as 'Unsuitable' areas for wind energy development. The Knockfierna LCA is around 12km to the west of the Site and although it does not host a designated scenic route it is also deemed unsuitable for wind energy development as is the Shannon ICZM in the northern periphery of the study area.

On balance of the reasons outlined above, whilst the landscape associated with Lough Gur, Tory Hill, Knockfierna and the Shannon corridor is considered to have a comparatively high landscape sensitivity as a result of their comparative scenic, recreational, and heritage values, the landscape sensitivity of the Wider Study Area is deemed to retain an underlying Medium-Low sensitivity.

12.3.6 Sensitivity of Visual Receptors

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 assessor uses a range of criteria to analyse how strongly the viewer/view is associated with each of the criterion identified in Section 12.2.7 of this chapter.

12.3.6.1 Sensitivity of Designated Scenic Routes and Views (SR/SV)

There is only a modest number of scenic routes contained within the Study Area and none within the Central Study Area. The most relevant scenic routes to the Proposed Development are those located nearest to it, as they have the greatest potential to offer clear views of the proposed turbines. The nearest scenic routes relate to Lough Gur and Tory Hill, and both circumnavigate these elevated features. Nonetheless, the scenic amenity appears to be derived more from the introspective view of these features than from outwardly expansive views across the surrounding plains. In the southern extremities of the Study Area are several designated scenic routes within County Cork, which have limited or no views towards the Site from the opposite side of the Ballyhoura range. As identified in the visual baseline, the viewpoints relevant to the project are VP3, VP4, VP17, VP18, VP19 and VP21. While many of these viewpoints also represent other receptors, their primary relevance in this assessment lies in their scenic designation as outlined in the relevant County Development Plan.

Overall, the views are not particularly rare or unique, and they do not feature striking or noteworthy landscape features. Instead, they tend to comprise of views across a productive agricultural landscape and valued more for their extent or visibility of particular features that are not overtly scenic. Therefore, the highest level of visual receptor sensitivity at any of the scenic designations is deemed to be High-medium and applied on a case by case basis.

12.3.6.2 Sensitivity of Local Community views (LCV)

The assessment of visual sensitivity for local community views focuses on the perspectives of individuals who live, work, or travel within approximately 5km of the Proposed Development Site. These people are most likely to experience changes in their visual amenity due to the proximity of the turbines, their potential visibility from various directions, or the turbines becoming a familiar part of their daily views. The relevant viewpoints for this assessment within the Central Study Area include VP7, VP9, VP10, VP11, VP12, VP13, VP14, VP15 VP16, VP17, VP18 and VP20.

The Local Community views tend to be across a typical rural landscape and are often contained at relatively short distances by surrounding vegetation. Whilst they are valued at a local level by local residents, they are not rare or distinctive and are not highly valued in the context of the broader population in the manner that scenic designations in a county development plan are, for example. However, it is acknowledged that residents at home are susceptible to changes in their localised views even in productive rural areas already characterised by wind energy development. On balance of these value and susceptibility considerations Local Community receptors are generally considered to have Medium-low visual receptor sensitivity subject to specific amenity considerations at each VP location.

12.3.6.3 Sensitivity of Centres of Population (CP)

Eight viewpoints were selected to represent population centres within the central and Wider Study Area (VP1, VP3, VP4, VP5, VP7, VP8, VP16 and VP22). Population centres are generally considered to have mid to low levels of visual receptor sensitivity because they are built-up environments where visual change is more common and less impactful. Considering the busy, built settings of these viewpoints, the visual sensitivity of these locations is generally deemed to be Medium-low.

12.3.6.4 Sensitivity of Major Routes (MR)

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. Major routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

Only two viewpoints (VP2 and VP6) were selected primarily to represent major routes albeit many major route receptors pass through settlements and cover both receptor types in this study. Overall, the viewpoints represent a considerable number of viewers but have limited amenity, resulting in a sensitivity of generally Medium-Low in both instances.

12.3.6.5 Sensitivity of Amenity and heritage features (AH)

The key amenity and heritage feature within the context of the Study Area is the Lough Gur Archaeological complex around 6km to the northeast, which is covered by VP17, VP18 and VP19 for the visual impact assessment. Two of the views are relatively enclosed at the Grange Stone Circle (VP17) and Lough Gur Wedge Tomb (VP18) whilst VP19 is oriented along the Lough where it is framed within the fore-to-middle ground context but more expansive than the other two. The receptor sensitivity at all of these VPs is deemed to be High-medium.

12.4 Assessment of Landscape Impacts and Effects

12.4.1 Construction Phase

It is considered that the Proposed Development will have a modest physical effect on the landscape within the Site, with land disturbance being localised and relatively limited. Disturbance to existing vegetation to accommodate the TDR, and the required access tracks and turbine hardstand areas will largely relate to vegetation that is not readily discernible from locations beyond the immediate locality.

Whilst there will be changes to topography through excavation, stockpiling, the creation of temporary hardstand areas, and other features, these works are temporary and small scale being localised to the immediate locality of the turbines and access tracks. It is noted that the finalised internal access track layout has been designed to avoid environmental constraints where possible and follow the natural contours of the land wherever possible reducing the extent of 'cut and fill'. 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 will be an intensity of construction phase 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 as well as being dispersed between the two turbine clusters.

The proposed 110kV onsite substation is contained approximately 330m to the east of turbine T6. From the onsite substation the Grid Connection Route will run northwards for approximately 27.6km following a series of local

and regional roads until it reaches the N24 national road and eventually connects to the existing Eirgrid 220/110kV Killonan Substation. The cabling will be laid within the roadbed throughout and there will be numerous river crossings within the road network. Underground directional drilling will be employed at the Sixmile Bridge which is a listed structure built in the 1800s and consists of a multi span Masonry Bridge Crossing the Camoge River. The directional drilling will require reception pits at either end as a short term construction measure. All of the grid connection cabling works will be transient and temporary presenting as typical road works to passers-by and without physical consequence for anything but the road surface.

All Wind Farm internal cabling will be underground and will run under access tracks or within their verges 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 Development and to provide access. Impacts from land disturbance and vegetation loss at the Site are modest in the context of this landscape setting that is influenced by an array of working rural land uses relating to farming and forestry.

Whilst there will be some long-term/permanent construction phase effects on the physical landscape, these are localised in extent. In relation to decommissioning, excepting some residually useful access tracks, all other above ground development features will be removed from the Site, and the land reinstated/restored. The below-ground concrete associated with turbine bases will not be removed as this would generate potentially greater environmental effects than leaving it in-situ under the prevailing land cover. The construction phase landscape effects of the development are substantially reversible at decommissioning except for the substation which will remain.

In terms of impacts on landscape character during construction, the erection of the proposed turbines, and the associated activity and movement associated with tall lifting plant, would introduce additional vertical features into views. As per the construction programme outlined in Volume II, Chapter 04 Civil Engineering of this chapter, construction-related activity will be short-term in nature (in accordance with the EPA definition of impact duration) and will cease once the Development becomes fully operational. Whilst these activities will generate temporarily heightened visual effects, their influence on perceived landscape character is considered modest in the context of movement that occurs throughout this landscape along road networks, and that associated with an operational wind farm. As such a greater proportional focus is placed on the long-term effects of the operation of the wind turbines on landscape character.

It is recognised that site activity will be at its greatest during the construction phase due to the operation of machinery on site and the movement of vehicles to and from the Site, and that the activities and works taking place at ground level have the potential to impact landscape character at a localised level. Works associated with the TDR, infrastructure foundations, wind farm underground cable installation, groundworks (including the excavation, stockpiling, deposition, and reinstatement of Site-won material), will contrast the underlying agrarian characteristics of the landscape. These works are short term, and temporary in nature and localised in extent. The effects would cease as soon as the turbines have been erected and become operational.

The highest level of construction phase landscape character impacts will occur towards the latter stages when the turbines have been substantially constructed, but not yet commissioned and likely to be facing in different directions with much of the associated construction stage machinery, facilities and stockpiling still present. Such impacts will be most pronounced within and immediately surrounding the site, whereas from increasingly broader distances ground-based site activity will not be visible and only the emergent turbines will influence landscape character.

Construction Phase landscape impacts result from the combination of physical changes to the landscape fabric, construction related activity and machinery and the influence of the emerging turbines on landscape character. The magnitude of landscape impact in relation to this combination of factors at the construction phase is deemed to be of a High-magnitude within the Site and its immediate surrounds (<c.1km), which when combined with a

Medium-Low sensitivity, results in a worst-case significance of landscape effect of **Substantial-moderate**, which will be of a **Adverse** quality. With increasing distance beyond 1km, the magnitude of Construction Phase impacts will reduce to Medium (c. 1-3km) and then Medium-low (c. 3-5km) as the ground-based activity becomes increasingly screened from view and the development and activities become an increasingly smaller component of a much broader landscape context. Consequently, the significance of effect also reduces to **Moderate** and **Moderate-slight**. Beyond the Central Study Area, the significance of Construction Phase landscape effect reduces further and only relates to the emergence of the pre-commissioned turbines. Even though the sensitivity of distinct landscape features such as the Lough Gur archaeological complex and Tory Hill, have higher sensitivity, the magnitude of impact reduces with increasing distance, broader context and screening of ground-based construction activity. Consequently, the significance of construction phase landscape effect is not considered to be greater for these landscape receptors.

It is considered that the Proposed Development will not generate significant landscape effects during the construction phase.

12.4.2 Operational Phase

For most commercial wind energy developments, the greatest potential for landscape impacts occurs from 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 defining element of that landscape character.

In this instance, wind turbines are a familiar and characteristic feature of the Wider Study Area, with existing wind turbines associated with the Kilmeedy, Boorland, Rathnacally, Buttevant, Castlepook and Slievereagh Wind Farms covering the landscape near the periphery of the Study Area to the west, south and southeast. Effects are therefore generated primarily through the introduction of additional turbines to this wider wind farm context albeit a wind farm of the scale of the Proposed Development in this location would be considered a new form of development in the local context.

In terms of scale, the broad landform and land use context of the site and its surrounds help to assimilate the Development. In terms of function, the landscape has a utilitarian character due to the presence of working rural land uses such as agriculture and forestry. Although the Proposed Development inherently represents a stronger human presence and level of built development than currently exists for the site and its immediate surrounds, it will not unduly detract from the productive rural character of this landscape.

Although the Development will influence the long-established pastoral character and qualities of the landscape, the turbines will generally be seen as part of the wider wind farm context from the nearest scenic designations and sensitive landscape units identified in the LDP. The spacing afforded between the turbines will maintain a high degree of visual permeability to ensure that visual relationships with the wider landscape will remain available, and the underlying features and characteristics of the landscape will be retained. In this respect the proposed wind farm represents a supplementary vertical land use that does not unduly interfere with the ground plane rural productivity of the site and its surrounds.

In summary, there will be physical changes to the land cover of the Site as a result of the development that will endure during the operational phase, but these will be relatively minor in the context of this working, rural landscape, that includes extensive areas of agricultural land and forestry. The scale of the Development will be well assimilated within its landscape context without undue conflicts of scale with underlying landform and land use patterns.

Within the Central Study Area and in relation to the Site and its immediate environs (within approximately 1km), the magnitude of change to landscape character is deemed to be High-medium. When combined with a Medium-

Low sensitivity, the level of landscape effect is considered **Moderate**. Beyond this distance, the magnitude of change to landscape character will reduce to Medium-Low for the remainder of the Central Study Area. When combined with a Medium-Low sensitivity, the resulting level of landscape effect is deemed **Moderate-slight** tending to **Slight** with increasing distance.

Beyond the Central Study Area (>5km from the Site) are some of the more sensitive landscape areas such as Lough Gur and Tory Hill. However, the significance of landscape effect is not considered to be higher than Moderate-slight for these areas because of distance reducing the magnitude of effect on landscape character as well as the degree of screening that reduces intervisibility.

For the Wider Study Area, the addition of the proposed turbines in the context of other neighbouring wind farms, particularly throughout the southern quarterns of the Study Area is not considered to generate any notable indirect influence on perceived landscape character. Whilst the proposed turbines may be visible and contribute to a marginal increase in the intensity of wind energy development and built development generally, this change would be difficult to discern in the context of wider views and would not notably alter perceived character. The magnitude of change to landscape character will reduce to Low and Negligible with increasing distance from the Site, as the proposed wind farm becomes a proportionately smaller and less distinct component of the overall landscape fabric, and other features and characteristics prevail in their influence on character. When combined with a Medium-low sensitivity, the resulting level of landscape effect is deemed **Slight** or lower.

The quality of the landscape effects will be Adverse, albeit it is considered that at distances over approximately 15km, the effect of the proposed turbines on perceived landscape character would be so negligible, that effects would be Neutral in their quality. The duration of the effects will be long-term (35years) except in the case of the site substation which will remain in perpetuity as part of the national grid infrastructure.

For the reasons outlined above, it is not considered that there will be any significant adverse landscape effects arising during the operational phase of the wind farm.

12.4.3 Demolition or Decommissioning Phase

With the potential exception of Site access tracks that may be left in situ for use by landowners and the substation which will form part of the established grid network, the decommissioning phase will see the removal of all turbines and associated infrastructure from the Site, with areas of hard standing that are of no further use reinstated and reseeded to blend with the prevailing surrounding land cover. The below-ground concrete associated with turbine bases will not be removed as this would generate potentially greater environmental effects than leaving it in-situ under the prevailing land cover.

It is expected that the decommissioning phase will be completed within one year and that within a relatively short period of time following decommissioning (approximately 2-3 years) there will be little evidence that a wind farm was present.

The decommissioning phase will have similar effects as the construction phase primarily as a result of the removal of turbines and the movement of large turbine components away from the Site. There may be a minor disturbance to roadside and trackside vegetation that has grown during the operational phase, and temporary stockpiling of material, albeit these aspects would be temporary and readily reinstated.

As with construction phase effects, decommissioning phase effects are deemed to be at most **Moderate** and **Adverse** but this is temporary effect that is not considered to be significant in EIA terms.

12.5 Assessment of Visual Impacts and Effects

12.5.1 Construction Phase

During construction, the most notable visual effects will result from the erection of the proposed turbines, with lifting plant introducing additional vertical features into views. As per the construction programme outlined in Volume II, Chapter 04 Civil Engineering of this EIAR, construction-related activity will be short-term in nature (in accordance with the EPA definition of impact duration) and will cease once the development becomes fully operational.

The visual effects generated by the activity associated with the erection of the turbines are considered in the context of their temporary nature, and a greater proportional focus is placed on the long-term effects of their operation. However, for visual receptors within the Central Study Area, this activity is likely to be discernible and will generate a modest impact on visual amenity. For visual receptors within the Central Study Area, the magnitude of visual impact at the construction phase is deemed to be High-medium. When combined with a generally Medium-low receptor sensitivity, the level of visual effect will be no greater than Moderate. Even though the sensitivity of visual receptors at Lough Gur and Tory Hill, have higher sensitivity, the magnitude of impact reduces with increasing distance, broader context and screening of ground-based construction activity. Consequently, the significance of construction phase visual effects is not considered to be greater for these visual receptors.

For visual receptors in the Wider Study Area, the ground-based activity associated with the turbine construction is unlikely to notably influence the visual amenity of any given view, given that this activity would be difficult to discern at distance and due to intervening screening. When combined with a generally Medium or Medium-low sensitivity, the level of visual effect will be no greater than Moderate-slight.

It is not considered that the Proposed Development will generate significant visual effects at the construction phase.

12.5.2 Operational Phase

In the interests of brevity and so that this chapter remains focussed on the outcome of the visual assessment (rather than a full documentation of it), the visual impact assessment at each of the 22 selected representative viewpoint locations has been placed into this EIAR Volume III, Appendix 12A, and this section should be read in conjunction with it.

Reference should also be made to the associated photomontage set contained in a separate booklet accompanying this EIAR (Volume IV). A summary table (Table 12-10) collates the assessment of visual impacts. A discussion of the results is provided thereafter.

Table 12-10: Summary of Operational Phase Visual Impact Assessment from representative VPs (see Appendix 12A)

VP No.	Distance to nearest turbine	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance / Quality / Duration of Impact
VP1	9.3	Medium-low	Low-negligible	Slight-imperceptible / Neutral-Adverse / Long-term
VP2	7.9	Medium-low	Low-negligible	Slight-imperceptible /

VP No.	Distance to nearest turbine	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance / Quality / Duration of Impact
				Neutral-Adverse / Long-term
VP3	12.6	Medium-low	Low	Slight / Adverse / Long-term
VP4	12.6	Medium-low	Low-negligible	Slight-imperceptible / Neutral-Adverse / Long-term
VP5	12.4	Medium-low	Low-negligible	Slight-imperceptible / Neutral-Adverse / Long-term
VP6	6.4	Medium-low	Negligible	Imperceptible / Neutral / Long-term
VP7	5.4	Medium-low	Low	Slight / Adverse / Long-term
VP8	5.3	Medium-low	Low	Slight / Adverse / Long-term
VP9	2.1	Medium	Medium-low	Moderate-slight / Adverse / Long-term
VP10	1.7	Medium	High-medium	Substantial-moderate / Adverse / Long-term
VP11	0.8	Medium-low	High	Substantial-moderate / Adverse / Long-term
VP12	1.7	Medium-low	High-medium	Moderate / Adverse / Long-term
VP13	1.1	Medium-low	High-medium	Moderate / Adverse/ Long-term
VP14	0.70	Medium-low	Medium	Moderate / Adverse / Long-term
VP15	0.9	Medium-low	High-medium	Moderate / Adverse / Long-term
VP16	1.9	Medium-low	Medium-low	Moderate-slight/ Adverse/ Long-term
VP17	5.2	High-medium	Negligible	Imperceptible /

VP No.	Distance to nearest turbine	Visual Receptor Sensitivity	Magnitude of Visual Impact	Significance / Quality / Duration of Impact
				Neutral / Long-term
VP18	5.9	High-medium	Negligible	Imperceptible / Neutral / Long-term
VP19	6.9	High-medium	Low	Moderate-slight/ Adverse / Long-term
VP20	2.7	Medium-low	Negligible	Imperceptible / Neutral / Long-term
VP21	6.6	Medium	Negligible	Imperceptible / Neutral / Long-term
VP22	15.0	Medium	Negligible	Imperceptible / Neutral / Long-term

The significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude, determined through professional judgement as informed by the significance matrix in Table 12-5. Visual impacts are summarised below by receptor type.

12.5.3 Visual Impacts on Designated Scenic Views / Routes

All of the designated scenic routes and views that fall inside the ZTV pattern were investigated in the baseline assessment and/or during fieldwork to determine whether actual views of the Proposed Development might be afforded. As identified in the visual baseline, the designated viewpoints relevant to the project are represented by VP3, VP4, VP17, VP18, VP19 and VP21 herein. While many of these viewpoints also represent other receptors, their primary relevance and sensitivity lies in their scenic designation as outlined in the relevant Development Plan.

VP3 and VP4, which represent the Kilfinane Scenic Drive and Castleoliver Scenic Drive respectively, are a considerable distance to the southeast of the site. These viewpoints also represent the settlements of Kilfinane and Ardpatrick. Both VPs afford slightly elevated views across the lowlands to the north and will see the majority of turbines if alone partially above intervening vegetation. Given the viewing distances involved, the turbines are seen at a small scale and the significance of effect was deemed to be Slight for VP3 and Slight-imperceptible for VP4.

VP17, VP18 and VP19 all represent the scenic route that surrounds the Lough Gur Heritage complex and are from key features of that area. VP17 is from the Grange Stone Circle and VP18 is from the Lough Gur Wedge Tomb and neither has the potential for visibility of the Proposed Development, hence the effects are deemed Imperceptible by default. VP19 is from the local road at the northern end of Lough Gur, which is afforded partial views along the alignment of the Lough itself. From here the partial blade sets of around three of the proposed turbines will be seen rising just above the terrain and vegetation that forms the skyline at the head of the lough. There will be some degree of visual ambiguity relating to scale and distance as well as the actual landscape context of the turbines relative to that of the enclosed foreground Lough. The development also represents a new form of built

development within a scene that does not currently contain a high degree of overt human intervention. The Lough Gur complex is also associated with archaeological heritage features and the turbines will be a modern element within the view. Nonetheless, the turbines are a considerable distance away and read as a background feature that is discrete from the foreground setting. Consequently, the overall visual effect was deemed to be Moderate-slight and largely on the basis that the receptor was assessed to be of a High-medium sensitivity as the magnitude of change was only considered to be Low.

The proposed turbines will not be visible from VP21, which represents the scenic route surrounding Tory Hill some 6.6km to the northwest. Consequently, the visual effect was deemed Imperceptible by default.

There is not considered to be any significant effects from the Proposed Development at any designated scenic routes and views.

12.5.4 Visual Impacts on Local Community Receptors

In total, of the 22 viewpoints assessed as part of this LVIA, twelve (VP7, VP9, VP10, VP11, VP12, VP13, VP14, VP15 VP16, VP17, VP18 and VP20) were selected as being relevant to a consideration of visual effects in relation to the local community. This category of visual receptor represents individuals who live, work and move around within approximately 5km of the Proposed Development Site. These individuals are most likely to experience changes in their day-to-day visual amenity due to the proximity of the turbines, their potential visibility from various directions, or the turbines becoming a familiar part of their daily views.

The sensitivity was generally assessed as Medium-low for these receptors, this reflecting typical views influenced by the surrounding productive rural landscape. It also reflects a balance between the limited and localised value of afforded views against the generally higher susceptibility of residents at home.

The highest significance of effect for this category of receptor was deemed to be Substantial-moderate, which is just below the threshold of a significant effect in the context of this assessment. This level of effect occurs at VP10 and VP11, which are both to the south of the largest southern cluster of the Proposed Development with VP11 being the closer of the two and VP10 being the more sensitive (Medium sensitivity) as it represents Dromin Graveyard and church ruins.

At VP10 there is a clear and unambiguous view of the proposed windfarm trailing across the plains at a prominent scale. The turbines have a broad lateral extent covering the northern quarters of the vista. The nearest and perceptibly largest of the turbines are contained within the more condensed cluster at the central and right-hand side of the cluster (northeast) with perceived scale and spacing intensity dissipating to the left-hand side (north). This generates a strong sense of perspective and depth for the array that emphasises the scale and distance of the view in general. There are some overlapping blade sets that will generate a minor degree of visual clutter but the scale differential between turbines counters that effect somewhat by highlighting the spacing between them. There will be a considerable increase in the scale and extent of built development within the view. However, it is a broad rural vista across a productive lowland landscape where the turbines appear as a compatible component without unduly impacting on the agricultural land use below.

At VP11, the proposed turbines will also be fully visible at a prominent scale stretching across the northern quarters of the view in close proximity. They will have a dominant visual presence and will be the most distinctive aspect of the northerly vista. Again, they are seen in a clear and unambiguous manner from base to tip and there is a reasonable sense of visual permeability through the wind farm. There is also a strong sense of perspective generated by the scale differential between the nearest and furthest turbines, which highlights the depth of the layout. The windfarm brings a new form of development consisting of tall moving structures that will considerably increase the scale and intensity of built development within the scene. Nonetheless, the turbines do not appear out of place in this productive rural vista and are not considered to be overbearing.

There are also four local community viewpoints at which Moderate visual effects are assessed to occur (VP12, VP13, VP14 and VP15). These are all within relatively close proximity to the Proposed Development (within 2km) but tend to have views of turbine clusters at different scales dispersed throughout the views. Whereas one cluster might have blade sets that are openly visible above intervening vegetation, other more distant clusters are fully or substantially screened, which tends to differentiate these assessments from the Substantial-moderate effects assessed for VP10 and VP11. Most notably for VP13 and VP14, which are from the local road that dissects the site and have views of turbines on both sides of the road, one of the clusters is prominent and openly visible whist the other is substantially screened, and the openly visible cluster differs for both viewpoints.

From the remaining local community viewpoints, the significance of visual effect ranges between Moderate-slight and Imperceptible. These views are generally beyond 2km of the nearest turbine or the majority of turbines with the blades sets rising partially above the intervening vegetated skyline. This reduction of visual impact within a relatively short distance reinforces the findings of the Route Screening Analysis (RSA) which saw a similar drop-off in turbine visibility beyond 2-3km.

There is not considered to be any significant effects from the Proposed Development at any local community receptors.

12.5.5 Visual Impacts on Centres of Population

Eight of the 22 viewpoints were selected to represent population centres and these include VP1, VP3, VP4, VP5, VP7, VP8, VP16 and VP22. Population centres are generally considered to have mid to low levels of visual receptor sensitivity because they are built-up environments where visual change is more common and less impactful particularly where it occurs within the surrounding rural hinterland.

The visual effects assessed for centres of population are generally in the lower range of between Slight and Imperceptible with the one exception being VP16 from the nearest settlement to the site of Bruff, which is assessed as Moderate-slight.

The settlements of Hospital (VP1), Kilfinane (VP3), Ardpatrick (VP4) and Charleville (VP5) are all contained within the outer southern quarters of the Study Area as the land begins to ascend towards the Ballyhoura Range. Consequently, they are all afforded similar, slightly elevated broad views across the lowland plains of Limerick to the north. The proposed turbines tend to be fully or partially visible as small-scale features of those distant plains, hence the range of Slight to Imperceptible effects depending on the degree of screening. At VP7 from the settlement of Bruree, which is 5.4km to the southwest, the visual effect is also Slight due to the considerable degree of screening. There is no view afforded from the heritage settlement of Adare (VP22).

From the nearest village of Bruff, VP16 on the bridge over the Morningstar River that passes through the southern outskirts of the town affords only a partial view of one blade set, but it is on the road alignment rising just above and beyond intervening treetops. The turbine blades are seen at a noticeable scale despite the high degree of screening, and it may appear slightly ambiguous rotating within this urban context without a clear understanding of the rural context within which the turbine sits and its scale relative to distance. Nonetheless, these effects are diluted by the high degree of screening of the Proposed Development in general.

There is not considered to be any significant effects from the Proposed Development at any centres of population.

12.5.6 Visual Impacts on Major Routes

These include national and regional level roads and rail lines and sensitivity generally relates to the number of viewers potentially impacted by the Proposed Development rather than inherent sensitivity of road users. Major

routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

Whilst a number of viewpoint locations are on major routes, only two viewpoints were selected primarily to represent major routes and have not otherwise been summarised above in relation to other more sensitive visual receptor categories. These are VP2 from the R515 regional road nearly 8km to the southeast of the site and VP6 from the N20 national road at Harding Grove 6.4km to the west of the site. These attract visual effect assessments of Slight-imperceptible and Imperceptible respectively due to distance and levels of intervening screening.

There is not considered to be any significant effects from the Proposed Development at any major routes.

12.5.7 Visual Impacts at Tourism, Recreation and Heritage Features

One of the key considerations for this Proposed Development is the visual effects from the important and well visited archaeological complex of Lough Gur approximately 6km to the northeast of the site, which is represented by three viewpoints (VP17, VP18 and VP19). These are all contained on a designated scenic route associated with the archaeological complex which have been summarised in terms of visual effects in Section 12.5.3 above relating to scenic designations.

The internationally renowned Adare Manor Golf Course is contained on the outskirts of Adare over 15km away in and enclosed riverside setting where there will not be any visibility of the proposed turbines.

There is not considered to be any significant effects from the Proposed Development at any tourism, recreation and heritage features.

12.5.8 Night Time Visual Impacts

There will be aviation navigation lights mounted to the hubs of peripheral turbines within the array. Whilst these are likely to be discernible from the ground they will be baffled on their undersides to limit light spill towards the ground. Whilst this is a rural area with relatively low levels of ambient nighttime lighting, it is not an area designated as a 'dark sky reserve' and there are settlements, houses and other wind farms that contribute to the baseline lighting context. Visual amenity, which is a principle consideration of this landscape and visual impact assessment is predominantly concerned with daytime views and the visible attributes of landscape character. These factors are not unduly influenced by nighttime lighting effects, which will be minor in any event. For these reasons, significant visual effects are not considered to occur from turbine lighting.

12.5.9 Visual Impacts during Demolition or Decommissioning Phase

With the exception of the substation and site access tracks that will be left in situ, the decommissioning phase will see the removal of all turbines and above-ground infrastructure from the Site, with areas of hard standing that are of no further use reinstated and reseeded to blend with the prevailing surrounding land cover.

It is expected that the decommissioning phase will be completed within one year and that within a relatively short period of time following decommissioning (approximately 2-3 years) there will be little evidence that a wind farm was present.

The decommissioning phase will see a similar nature of effects to the construction phase due to the movement of heavy machinery within the Site, and to and from the Site removing turbine components. However, such effects will be temporary in duration and decrease in scale as turbines are removed from view and the landscape is substantially reinstated.

As with construction phase impacts, decommissioning phase effects are not considered to be significant

12.5.10 Do-Nothing

From a landscape and visual perspective, there are many political, economic, social and environmental factors that may influence the baseline landscape and visual environment in the longer term.

In terms of wind energy development, the Site and wider landscape within the Agricultural Lowlands of County Limerick is considered to form part of an area, which is 'Preferred' for Wind Energy Development so it is likely that such development will continue to be brought forward in this general area to meet increasing demands for renewable energy.

In this instance, it is considered that the receiving landscape and visual baseline would remain in the same or similar condition as it is currently should the Proposed Development not proceed, albeit with pressure for similar scale and form of development likely to follow.

12.5.11 Cumulative Impacts and Effects

The consideration of cumulative landscape and visual effects is placed principally on the cumulative wind energy developments outlined in Table 12-11. The cumulative scenario of existing and pre-planning wind farms is outlined in Table 12-11 as there are currently no permitted and not built wind farm developments within the Study Area.

Table 12-11: Cumulative Wind Farms within the Study Area

Wind Farm	No. of turbines	Status	Distance / direction from Proposed Development
Kilmeedy	2	existing	20km west
Boorland	2	existing	18km southwest
Rathnacally	2	existing	16km southwest
Buttevant	6	existing	17km south
Castlepook	14	existing	16km south
Garrane	9	In-planning	10km southwest

A cumulative ZTV map is provided in this EIAR Volume III, Appendix 12B which shows the bare-ground intervisibility between the Proposed Development and all existing and permitted turbines.

A colour grading has been employed to illustrate the following types of theoretical visibility:

- Blue wash: indicates parts of the Study Area where theoretical visibility of the proposed turbines only is possible, and they will not be seen in combination with existing (and/or 'in-planning') turbines in the landscape;
- Pink wash: indicates parts of the Study Area where the proposed turbines have the potential to be seen with existing wind farms;
- Green wash: indicates parts of the Study Area where the proposed turbines would not be visible, but existing and permitted wind turbines would be.

Given the topographical character of the Study Area and the scale of existing wind turbines, it is unsurprising that the cumulative ZTV indicates that from over 85% of the Study Area, theoretical visibility of the Proposed Development in conjunction with existing and in-planning wind turbines is possible. The theoretical visibility of wind energy development is therefore acknowledged to be extensive in its coverage. The cumulative ZTV highlights that the proposed turbines have the potential to be viewed in isolation for a fraction (less than 3%) of the Study Area.

Existing wind turbines, have the potential to be viewed in isolation for notable portions of western, southern and south-eastern Study Area (c. 15%) beyond the upland areas they occur because those same upland areas screen views of the proposed turbines. It is also apparent that the upland turbines have sporadic visibility from elevated ground within the northern study area where the proposed turbines, within the lowlands, are not visible.

The in-planning Garrane Wind Farm is given due consideration in this cumulative assessment, however as it must still be brought through the planning process, there is no certainty that is will be realised in its current form despite also being in a 'Preferred' area for wind energy development. It should also be noted that the remainder of the developments are all existing and form part of the baseline development against which the Proposed Development has already been assessed herein.

There is strong potential for theoretical intervisibility between the Proposed Development and the in-planning Garrane Wind Farm as they both fall within the same lowland landscape without terrain features between them. In this scenario, they are also the closest developments to each other given that all of the existing wind farms are more than 16km from the Proposed Development. However, the Route Screening Analysis (RSA) undertaken for the Proposed Development indicates that there is little visibility of the Proposed Development from within the lowlands context beyond 3km. This substantially precludes intervisibility between these two lowlands developments. It should also be noted that Macro Works has undertaken RSA for the in-planning Garrane Wind Farm and it is similarly screened to the Proposed Development within its surrounding vegetated lowland context. This serves to further reinforce the very low levels of intervisibility between the two developments. Indeed, it is likely that only from elevated terrain such as that within the outer southern quarters of the Study Area are both of these developments potentially visible at the same time. In such circumstances they will be seen with a considerable separation distance, at broadly disparate viewing angles or with one as a distant background feature relative to the other.

In relation to the existing wind farms, which comprise of four dispersed pairs and one larger combined cluster (Buttevant and Castlepook), they are all a substantial distance from the Proposed Development at distances ranging between 16km and 20km. Furthermore, they are all contained within elevated upland areas which reinforces the physical and contextual separation. These existing wind farms also form part of the baseline for the visual impact assessment that has been detailed herein in relation to the Proposed Development and yet did not feature as a key consideration in any of the views. From enclosed lowland areas, long distance visibility of the existing wind farms around the periphery of the Study Area is rare. Whereas, from the more elevated upland areas around the southern quarters of the Study Area that host these existing wind farms, the Proposed Development is seen as a distant background feature of the lowland plains. This is generally in the opposite direction to the existing wind farms, at a broadly disparate viewing angle or with the Proposed Development as a distant background feature relative to the existing development.

Based on the assessment above and detailed throughout this chapter, it is considered that the proposed Ballinlee Wind Farm contributes a Low cumulative impact. When combined with the general Medium-low sensitivity of the receiving landscape and visual receptors, the cumulative effect is deemed to be no greater than Slight.

12.6 Mitigation and Monitoring Measures

12.6.1 Mitigation Measures

There are no specific mitigation measures proposed or indeed likely to be successful at reducing landscape and visual effects below what has been assessed herein. Instead, landscape and visual mitigation for wind energy development is embedded in the siting and design of the development that is eventually brought to planning. Such considerations include the 4 x turbine tip height setbacks from the nearest existing residential receptors as well as regular and even spacing between turbines.

12.6.2 Monitoring Measures

As there are no specific mitigation measures proposed there will not be any requirement for specific monitoring measure relating to the landscape and visual factor.

12.7 Residual Impacts and Effects

There are no specific mitigation measures proposed for the landscape and visual factor and therefore, residual effects are deemed to be the same as those set out in the main assessment Sections 12.4 and 12.5.

12.8 References

- Planning and Development Act 2000, as amended;
- Planning and Development Regulations 2001, as amended;
- Irish Planning and Development Act 2024, as amended;
- European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU);
- Environmental Protection Agency (EPA) (2022) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022);
- Landscape Institute and the Institute of Environmental Management and Assessment (IEMA) publication entitled Guidelines for Landscape and Visual Impact Assessment – Third Addition (2013) ;
- NatureScot (2021) Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments. [online];
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006);
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2019 draft);
- Scottish Natural Heritage Visual Representation of Wind Farms: Best Practice Guidelines (version 2.2 - 2017);
- Limerick Development Plan (2022-2028);
- Cork County Development Plan (2022-2028); and
- Tipperary County Development Plan (2022-2028).