



**STATKRAFT**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT  
(EIA) FOR DERNACART WINDFARM**

**VOLUME 2 – MAIN EIA**

**CHAPTER 11 – LANDSCAPE AND VISUAL**

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## 11 LANDSCAPE AND VISUAL

### 11.1 Introduction

This chapter describes the landscape context of the proposed Dernacart Wind Farm and assesses the likely landscape and visual effects of the scheme on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

**Landscape Impact Assessment (LIA)** relates to assessing the effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

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

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

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

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2017) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2015); and
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).
- Scottish Natural Heritage (SNH) Guidance Note: 'Assessing the cumulative impact of onshore wind energy developments' (2012)
- Scottish Natural Heritage (SNH) Siting and Designing Wind Farms in the Landscape Version 3 (2017)

This assessment report was prepared by Macro Works Ltd. landscape and visualisation consultants. Relevant experience includes assessment of over 100 on-shore wind farm proposals throughout Ireland, including six Strategic Infrastructure Development (SID) projects.

#### 11.1.1 Description of the Proposed Development

The developer proposes to locate an eight-turbine wind energy development on a predominantly forested site in north County Laois, between the settlements of Mountmellick (County Laois) to the south, Clonygowan (County Offaly) to the northeast, and the N80 to the west. The proposed development is described in full in Chapter 4 of the EIAR – Description of the Proposed Development in Volume 2 of this EIAR.

#### 11.1.2 Definition of the Study Area

The Wind Energy Development Guidelines published by the Department of the Environment, Heritage and Local Government (2006) 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:

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

In the case of this project, the blade tips are up to 185m high, and, thus, the minimum ZTV radius recommended is 20km from the outermost turbines of the scheme.

There are not considered to be any sites of national or international importance between 20 – 25km and thus, the radius of the study area will remain at 20km. Notwithstanding the full 20k extent of the LVIA study area, there will be a particular focus on receptors and effects within the central study where there is higher potential for significant impact to occur. When referenced within this assessment, the central study area is the landscape within 5km of the site.

## 11.2 Methodology

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

### 11.2.1 Desktop Study

- Establishing an appropriate Study Area from which to study the landscape and visual impacts of the proposed wind farm;
- Review of a Zone of Theoretical Visibility (ZTV) map, which indicates areas from which the development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape 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;
- Consultation with the local community and the Local Authority in respect of sensitive VRP locations to be included in the assessment.

### 11.2.2 Fieldwork

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

### 11.2.3 Appraisal

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

### 11.2.4 Assessment Criteria for Landscape Impacts

The classification system used by Macro Works to determine the significance of landscape and visual impacts is based on the IEMA Guidelines for Landscape and Visual Impact Assessment (2013).

When assessing the potential impacts on the landscape resulting from a wind farm development, the following criteria are considered:

- Landscape character, value and sensitivity
- Magnitude of likely impacts; 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 to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria:

**Table 11-1: Landscape Value and Sensitivity**

Sensitivity	Description
<b>Very High</b>	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.
<b>High</b>	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
<b>Medium</b>	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.
<b>Low</b>	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.
<b>Negligible</b>	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the proposal site boundary that may have an effect on the landscape character of the area.

Table 11-2: Magnitude of Landscape Impacts

Magnitude of Impact	Description
<b>Very High</b>	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.
<b>High</b>	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.
<b>Medium</b>	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.
<b>Low</b>	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.
<b>Negligible</b>	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 11-3: Landscape Impact Significance Matrix

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

\*Light grey shading indicates a level of impact that is considered to be 'significant' in EIA terms

Note that potential beneficial landscape impacts are not accounted for in the tables and matrix above. This is on the basis that commercial scale wind energy projects are very unlikely to generate beneficial landscape impacts. In the rare instances that this might occur, by facilitating the rehabilitation of a degraded landscape (for example), the benefits are considered in the overall appraisal and the significance of impact would default to the lowest end of the range (Imperceptible).

### 11.2.5 Assessment Criteria for Visual Impacts

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

#### 11.2.5.1 Visual Sensitivity

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

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

- **Susceptibility of receptor group to changes in view.** This is one of the most important criteria to consider in determining overall visual sensitivity because it is the single category dealing with viewer susceptibility. In accordance with the IEMA Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are;
  - *Residents at home;*
  - *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be 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; and*
  - *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened.*

Visual receptors that are less susceptible to changes in views and visual amenity include;

- *People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and*
- *People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life.*
- **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Development Plans, at least, a public consultation process is required;
- **Views from within highly sensitive landscape areas.** Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated with the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
- **Intensity of use, popularity.** Whilst not reflective of the amenity value of a view, this criterion relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;
- **Provision of elevated panoramic views.** This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas.

- **Sense of remoteness and/or tranquillity.** Remote and tranquil viewing locations are more likely to heighten the amenity value of a view and have a lower intensity of development in comparison to dynamic viewing locations such as a busy street scene, for example;
- **Degree of perceived naturalness.** Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by obvious human interventions;
- **Presence of striking or noteworthy features.** A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;
- **Historical, cultural or spiritual value.** Such attributes may be evident or sensed at certain viewing locations that attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
- **Rarity or uniqueness of the view.** This might include the noteworthy representativeness of a certain landscape type and considers whether other similar views might be afforded in the local or the national context;
- **Integrity of the landscape character in view.** This criterion considers the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
- **Sense of place.** This criterion considers whether there is special sense of wholeness and harmony at the viewing location; and
- **Sense of awe.** This criterion considers whether the view inspires an overwhelming sense of scale or the power of nature.

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

#### 11.2.5.2 Visual Impact Magnitude

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

Visual presence is a somewhat quantitative measure relating to how noticeable or visually dominant the proposal is within a particular view. This is based on a number of aspects beyond simply scale in relation to distance. Some of these include the extent of the view as well as its complexity and the degree of existing contextual movement experienced such as might occur where turbines are viewed as part of / beyond a busy street scene. The backdrop against which the 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. Instead, the 2003 SEI funded survey of 'Attitudes Towards the Development of Wind Farms in Ireland' found that *"wind farms are seen in a positive light compared to other utility-type structures that could be built on the landscape"*. A subsequent tourism study commissioned by Bord Fáilte in 2008 found that; *"Almost three quarters of respondents claim that potentially greater numbers of wind farms would either have no impact on their likelihood to visit or have a strong or fairly strong positive impact on future visits to the island of Ireland."* The purpose here is not to suggest that turbines are either inherently liked or disliked, but rather to highlight that the assessment of visual impact magnitude for wind turbines is more complex than just the degree to which turbines occupy a view. Furthermore, a clear and comprehensive view of a wind farm might be preferable in many instances to a partial, cluttered view of turbine components that are not so noticeable within a view. On the basis of these reasons, the visual amenity aspect of assessing impact magnitude is qualitative and considers such factors as the spatial arrangement of turbines both within the scheme and in relation to surrounding terrain and land cover. It also examines whether the development 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:

**Table 11-4: Magnitude Value and Sensitivity**

Criteria	Description
<b>Very High</b>	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
<b>High</b>	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
<b>Medium</b>	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
<b>Low</b>	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
<b>Negligible</b>	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

#### 11.2.6 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the significance matrix in Table 11.5 below.

**Table 11-5: Visual Impact Significance Matrix**

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

\*Light grey shading indicates a level of impact that is considered to be 'significant' in EIA terms

\*Note: The significance matrices provided above at table 11.3 and table 11.5 provide an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix.

## 11.3 Existing Environment

### 11.3.1 Landscape Baseline

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

A general description of the landscape context of the proposed wind farm site and wider study area is provided below. Additional descriptions of the landscape as viewed from each of the selected viewpoints are provided under the detailed assessments later.

### 11.3.2 Landform and Drainage

The landscape of the study area is predominantly flat to gently undulating, particularly in the central study area, with isolated hills in the south/southeast and the north/northeast, as well as the Slieve Bloom Mountains in the southwest, which exceed 500m AOD in height. A subtle elevated area also emerges northwest of the central study area, and plateaus at approx. 130m AOD. Most of the central study area, as well as large swathes of the north-eastern section of the study area, remain below 90m AOD.

Due to the flat and often boggy nature of much of the central study area, watercourses are generally not that distinctive, meaning drainage is, in places, a dendritic pattern of meandering small streams and drains. The River Barrow is an exception to this, which flows northwest-southeast through the central study area. Sourced in the Slieve Bloom Mountains, the Owenass River in the southwest and the Clodiagh River in the northwest, respectively, of the study area are less notable watercourses. In the north of the study area, both the Grand Canal and the relatively petite Tullamore River are also present.

The site of the proposed development is located in relatively low-lying lands below the 80m contour level. A small tributary of the River Barrow flows through the site and to the east of the site is another tributary of that river.

### 11.3.3 Land Use and Land Cover

The land cover of the central study area is a combination of cutaway peatland, and associated marginal farmland, reverting scrubland and forestry around the peatland fringes, as well as more productive agricultural farmland more frequently found on better-drained ground further from the cutaway peatland. Fields within such farmland vary from mid-large size.

The same general land cover pattern of the central study area is repeated in the northeast of the study area, but for most of the study area pastoral agriculture, followed by cropping and commercial conifer plantations, are the main land uses. Heather and commercial forestry are the major land uses across the Slieve Bloom Mountains. In the northeast quadrant of the study area, is the 28-turbine Mount Lucas windfarm, located across a regenerating/re-wilding cutaway bog in Co. Offaly, which also entrails 7km of public walkway-cycle way around the Bord na Mona wind farm. Upon the lowlands, only modest sized settlements occur within the study area and these contribute a low proportion of urban land cover in the context of the overall study area. In addition, there are a number of golf courses in the southeast and east of the study area, as well as heritage demesne landscapes such as Emo Court and Stradbally Hall.

The proposed Dernacart Wind Farm site is located along peatland fringe farmland and forestry at the southwestern and southern periphery of a substantial cutaway peatland area. Landcover on the site of the proposed development entails peat bog, coniferous forest and pasture. A large cutaway bog is located to the north and east of the site, while to the south and west are agricultural lands.



Figure 11-1: Land cover pattern of cutaway bogs, forestry and farmland within the central study area (Please note: red stars indicate turbine location).



Figure 11-2: Typical flat lowland landscape in the central study area



Figure 11-3: The Grand Canal cuts across the north of the study area



Figure 11-4: Heather and commercial forestry on the Slieve Blooms

### 11.3.4 Landscape Policy Context and Designations

#### 11.3.4.1 Department of Environment, Heritage and Local Government Wind Energy Development Guidelines (2006)

The Wind Energy Development Guidelines (2006) provide guidance on wind farm siting and design criteria for a number of different landscape types. The site of the proposed development is considered to be located within a landscape that is generally consistent with the 'Flat Peatland' landscape type in terms of flatness and broad scale land use patterns, which consist of predominantly cutaway peatland and peatland fringe forestry in the central study area. However, there is also flat farmland and peatland fringe farmland in the central study area that share some characteristics with the 'Hilly and Flat Farmland' landscape type from the Guidelines. In the wider study area, there is also the 'Mountain Moorland' landscape type, although this is located more than 8km southwest of the site of the proposed development.

In instances where two or more landscape types are potentially applicable, the Guidelines recommend consideration of the advice for each landscape type rather than just that, which is considered to be most applicable. The Guidance specifically states (p47):

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

Siting and design recommendations for the 'Flat Peatland' and 'Hilly and Flat Farmland' landscape types include the following:

**Table 11-6: Guidance for Wind Farms in the 'Flat Peatland' landscape type (DoEHLG Wind Energy Development Guidelines – 2006)**

Criteria	Guidance
<b>Location</b>	Wind energy developments can be placed almost anywhere in these landscapes from an aesthetic point of view. They are probably best located away from roadsides allowing a reasonable sense of separation. However, the possibility of driving through a wind energy development closely straddling a road could prove an exciting experience.
<b>Spatial Extent</b>	The vast scale of this landscape type allows for a correspondingly large spatial extent for wind energy developments.
<b>Spacing</b>	Regular spacing is generally preferred, especially in areas of mechanically harvested peat ridges.
<b>Layout</b>	In open expanses, a wind energy development layout with depth, preferably comprising a grid, is more appropriate than a simple linear layout. However, where a wind energy development is located close to features such as a river, road or escarpment, a linear or staggered linear layout would also be appropriate.
<b>Height</b>	Aesthetically, tall turbines would be most appropriate. In any case, in terms of viability they are likely to be necessary given the relatively low wind speeds available. An even profile would be preferred.

**Table 11-7: Guidance for Wind Farms in the 'Hilly and Flat Farmland' landscape type**

Criteria	Guidance
<b>Location</b>	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.
<b>Spatial Extent</b>	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.
<b>Spacing</b>	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.
<b>Layout</b>	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.
<b>Height</b>	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.

As can be seen from Tables 11.6 and 11.7 above, the guidance in respect of wind energy development in 'Hilly and Flat Farmland' is somewhat contradictory to that in 'Flat Peatland' areas, especially in regard to spatial extent and height. This is a regular occurrence when interpreting the Guidelines as most wind farm sites traverse or contain elements of more than one landscape type. In such instances it is necessary to understand the characteristics of the landscape types and how this has informed the particular guidance. For example, the degree of openness or enclosure from terrain and vegetation as well as the scale of prevailing landscape patterns are the main reasons for the disparate guidance in the two landscape types applicable to this site. The design approach for the proposed wind farm is most consistent with the guidance relating to 'flat peatland' landscapes, as this is the predominant character type. This is manifest in the proposed turbine height, whilst the extent of the eight-turbine development remains modest, as an acknowledgement of the shared peatland / farmland characteristics of the central study area.

#### 11.3.4.2 County Development Plans

The proposed wind farm is located in northern County Laois and aligns the County Offaly border. While these two counties occupy the vast majority of the study area, County Kildare enters the eastern fringe of the study area.

It is not considered that the proposed wind farm will materially impact on the landscape character of County Kildare, or other counties in the wider study area, even if turbines may be visible in the background from some elevated vantage points. For this reason, only the Landscape Character Assessment and associated Wind Energy policies for Counties Laois and Offaly will be considered in respect of potential landscape effects in this instance. The same approach does *not* apply to visual impacts and, where relevant, visibility of turbines from neighbouring counties within the study area will be appropriately assessed, particularly where this relates to designated scenic routes and views within the relevant County Development Plans (refer to Visual Baseline).

### 11.3.4.3 Laois County Development Plan (2017 – 2023)

A County Laois Landscape Character Assessment (2017-2023) has been prepared as part of the Laois County Development Plan (CDP). Section 4 of the Assessment entails “Landscape Trends of County Laois,” with section 4.2 relating to “Infrastructure and Industry,” which states that:

*“...Wind energy is also a visually prominent form of development and should be located away from highly sensitive landscapes and those of exceptional value. One landscape character type in the county being considered for this form of development is harvested peatland. While substantially lower than hill and mountain locations, the potential landscape impact will still need careful appraisal.”*

Section 4.8 of the Assessment relates to ‘Likely forms of Development.’ This entails ‘Wind turbines, installed as single turbines or wind farms,’ which states that:

*“...Increasing renewable energy provision is a key element of central and regional government policy and is also emphasised in the Laois County Development Plan, 2006-2012. Key impacts on landscape character will include visual impact on long and short-range views, sensitive historic landscapes and cumulative impacts of other wind farms, including those in neighbouring counties [...]. Physical impacts on sensitive landscape features such as habitats, historic artefacts and vegetation will also need to be considered and mitigated against.”*

In Section 5 of the County Laois Landscape Character Assessment, the county is divided up into seven Landscape Character Types (i.e. distinct types of landscape that are relatively homogenous in character). However, there is no stated or designated sensitivity for each Landscape Character Type (LCT).

The site of the proposed development is mostly within the “Lowland Agricultural Areas” (LCT2) Landscape Character Type, while also entering into the “Peatland Areas” LCT (LCT5). This is important to note, as LCAs seldom have abrupt or obvious boundaries between them. Instead, they tend to have core areas that contain the key defining features of the LCA, as well as peripheral areas that share some commonality with neighbouring LCAs, in what can often be a broad transitional zone. In this instance, most of the proposed turbines are located in a commercial conifer plantation that serves as a buffer between agricultural/ pastoral land use, and the commercially harvested peatland. A minority of the proposed turbines are located within lowland agricultural land use. Owing to such proximity and land use, the landscape character of the central study area bears most similarities to the aforementioned ‘Flat Peatland’ landscape type, from the Wind Energy Development Guidelines, followed by the ‘Hilly and Flat Farmland’ landscape type.

It should also be noted that approx. 4km southwest of the site is the north-eastern edge of the “Mountain Areas” LCT, and an “Urban Fringe Areas” LCT (i.e. Mountmellick) is within 2km southeast of the site. However, in terms of Landscape character, the salient landscape character of the central study area (i.e. less than 5km from the site) is characterised by a mix of the “Lowland Agricultural Areas” LCT and the “Peatland Areas” LCT.

#### **LCT2: Lowland Agricultural Areas:**

Key characteristics of this LCT include:

- *In terms of land use, it is comprised primarily of pastoral and tillage agriculture.*
- *It is generally a flat open landscape [...] with long-range views towards the upland areas.*
- *Field patterns tend to be of large scale and are generally bounded by deciduous hedgerows containing mature trees.*
- *Farm sizes are larger than average.*
- *Throughout the county there is an abundance of 18th and 19th century demesnes with extensive areas of mixed woodland and parkland bounded by original stone walls, creating an attractive landscape setting for the numerous estate houses.*
- *The Lowland LCT has been developed more extensively than other LCT’s, particularly in the north and east [...]. This has resulted in significant changes to the landscape character and it is crucial that future development of this LCT is carried out sensitively and with particular reference to the rural nature of the landscape.*
- *Much of the lowlands have an enclosed character with well-treed road corridors, dense hedgerows, parkland and areas of woodland.*

- Views of landmarks within the landscape and of the surrounding upland areas are a characteristic of this area and must be retained because the interaction between the lowlands and hills/uplands is an important feature of this LCT.

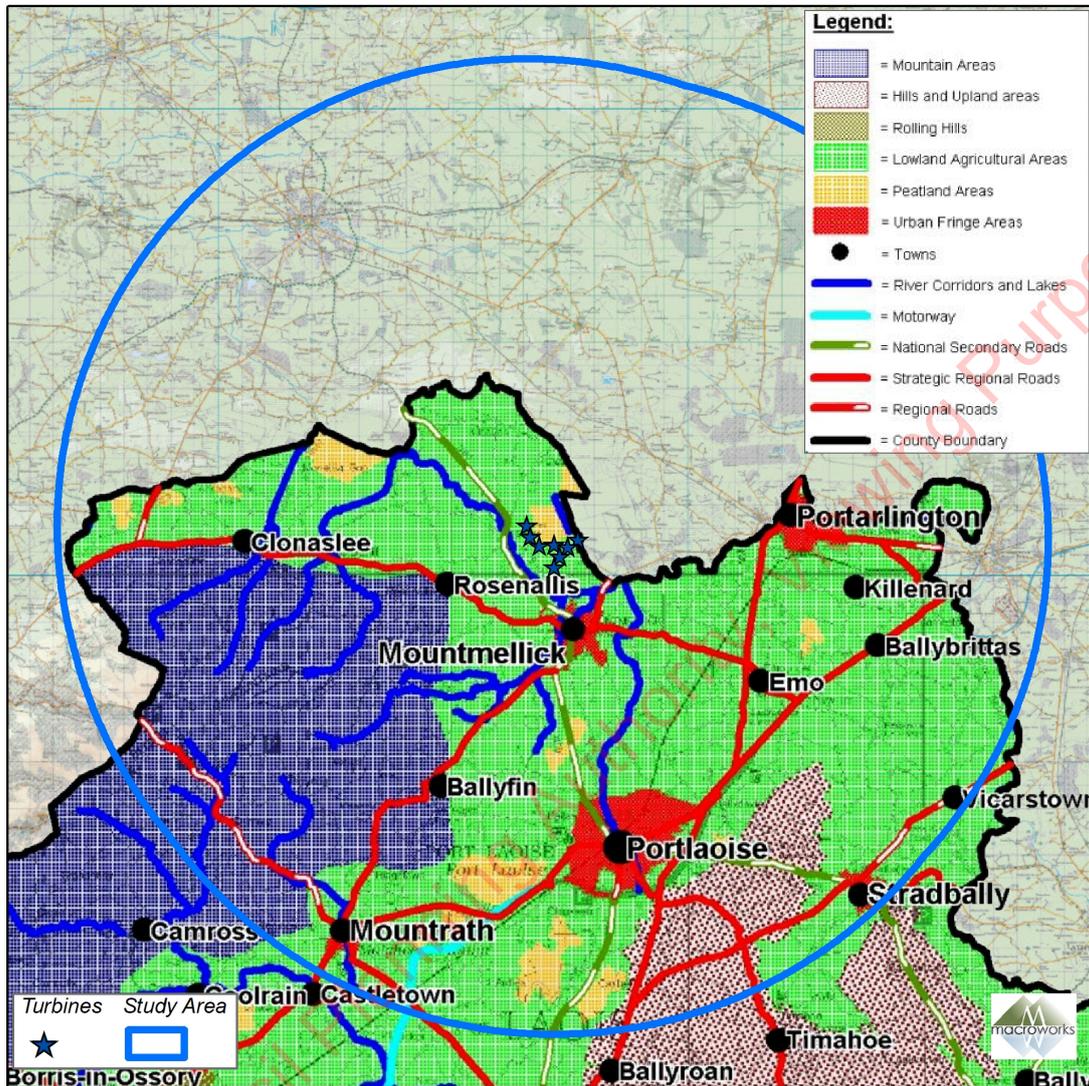


Figure 11-5: Extract of Map 6- Landscape Character Assessment of the Laois Landscape Character Assessment.

**LCT5: Peatland Areas:**

Key characteristics of this LCT include:

- Topography is strikingly flat.
- Land cover is raised bog, much of which is now exhausted and being considered for alternatives uses including afforestation, amenity and wind energy.
- This landscape type could be more accurately described as a specific habitat, rather than a landscape type per se.
- Commercially harvested peatland areas are generally devoid of vegetation and present as an evenly exposed surface of peat. Such a manmade landscape has a sterile and, indeed, industrial character.
- Pockets of rough grazing and scrubland also exist in this landscape character area.

Relevant general recommendations for this LCT include:

- *To recognise the importance of peatlands for ecology, history, culture and for alternative energy production.*

The Landscape Character Assessment for County Laois has not incorporated a specific sensitivity rating for each of the LCTs. Instead, sensitive landscapes are addressed in section 13.9 of the LCA where it states, "Sensitive areas include upland areas, visually open and expansive areas and areas in the vicinity of natural heritage or built heritage assets or scenic views". In that regard, the site of the proposed windfarm is not within, or in the vicinity of, any Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Nature Reserves, scenic views/prospects, significant tree groups or geological groups.

Landscape Policies within the Laois CDP are divided into a series of specific policies relating to landscape type.

Specific policies for LCT2 'Lowland Agricultural Areas' entail:

- **LS 9:** *Promote good agricultural practices to create a sustainable rural economy;*
- **LS 10:** *Provide incentives for smaller rural/family farms to manage their land to avoid loss of hedgerows and field patterns;*
- **LS 11:** *Maintain and enhance the 18th and 19th century estate landscapes and associated parkland & woodland to develop them as a tourism resource;*
- **LS 12:** *Diversify the urban fringe by developing mixed-use amenity areas, which will create a landscape buffer creating a transition between urban and rural areas;*
- **LS 13:** *Define the urban fringe with planting of native species and mixed woodland to tie into existing rural landscape;*
- **LS 14:** *Reflect the 18th and 19th century field patterns in the scale of new development;*
- **LS 15:** *Restoration of historic boundaries, walls to original standard with coursing and materials to match existing;*
- **LS 16:** *Ensure that the design of all single one-off houses is fully compliant with Rural House Design Guidelines.*

Specific policies for LCT5 'Peatland Areas' entail:

- **LS 40:** *Recognise the importance of peatlands for ecology, history, culture and for alternative energy production;*
- **LS 41:** *Conserve valuable habitats including any European and national designations;*
- **LS 42:** *Introduce design guidance in respect of commercial forestry in order to integrate this land use into the landscape;*
- **LS 43:** *Ensure that the design of all single one-off houses is fully compliant with Rural House Design Guidelines;*
- **LS 44:** *Support the identification of projects that have the potential to achieve commercial value such as industrial developments, renewable energy, tourism developments etc. while at the same time promoting high environmental standards and supporting Biodiversity objectives;*
- **LS 45:** *Support the restoration of peatlands on suitable sites.*

### **Amenity Views & Prospects**

According to Section 7.20 of CDP:

*"County Laois contains a number of valuable views and prospects which offer a very attractive cross-sectional view and overall impression of differing landscapes as one traverses the county. The protection of these views and prospects will be done on a case by case basis through the development management process when considering individual planning applications."*

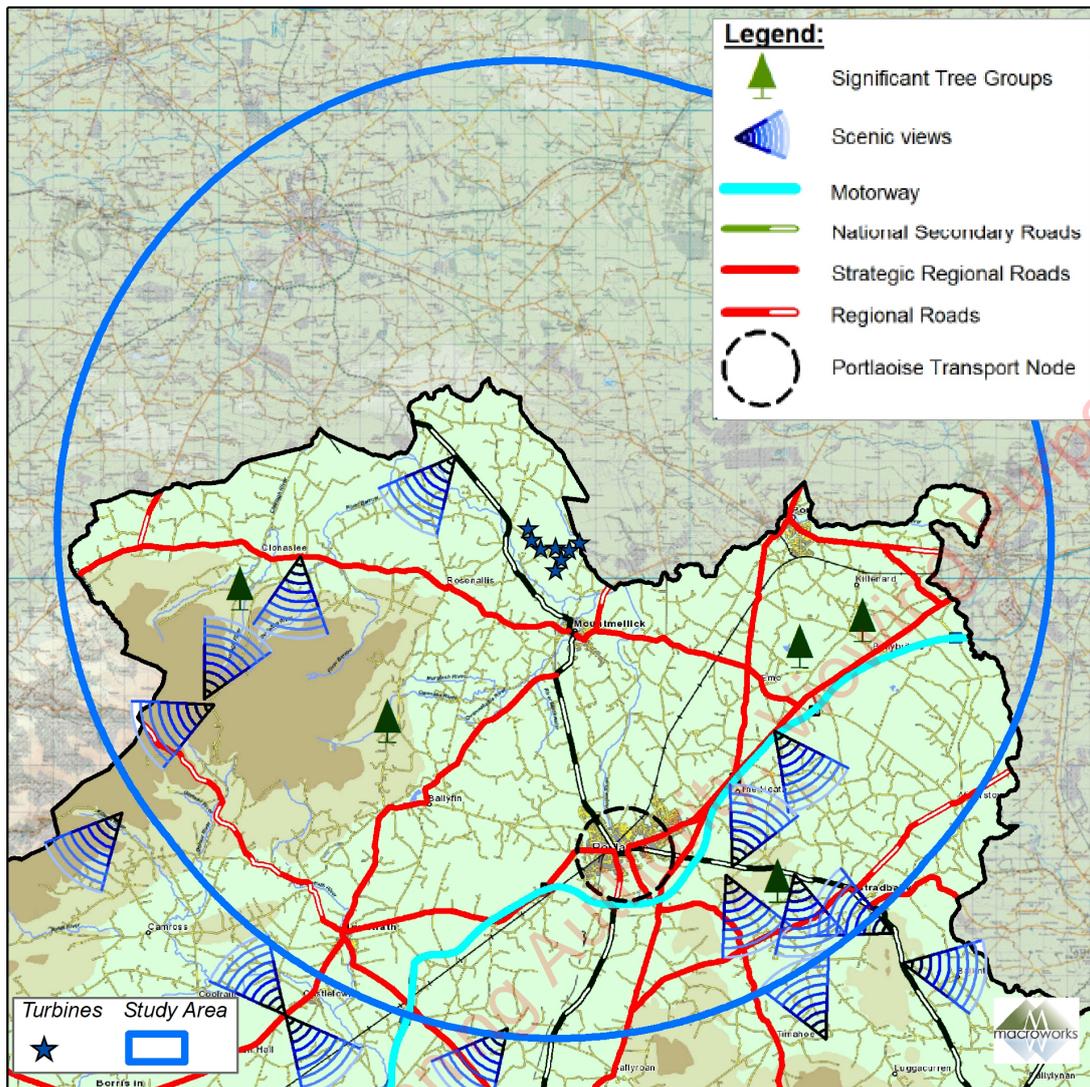


Figure 11-6: Extract of Map 1.7.11 – Trees/views and prospects, from the Laois CDP.

Of the 13 designated amenity views and prospects listed in Table 27 of the Laois CDP, only two are of potential relevance to the proposed development i.e. a view/prospect that is within the study area, with the indicated direction of that view being in the broader general direction of the site of the proposed development (as indicated in Table 11.6, above). These are:

- **004** Slieve Bloom Mountains;
- **005** Rock of Dunamaise.

It is the policy of the Council to:

- **AV1** Protect the views and prospects as indicated in the table above;
- **AV2** Discourage development which would materially affect these amenity views and prospects;
- **AV3** Ensure that appropriate standards of location, siting, design, finishing and landscaping are achieved.

### Wind Energy Strategy

A Wind Energy Strategy has been prepared for County Laois, which forms part of the County Development Plan. Section 4.5 of the Strategy entails the Landscape Character Types in County Laois, and the potential suitability of each for wind energy development.

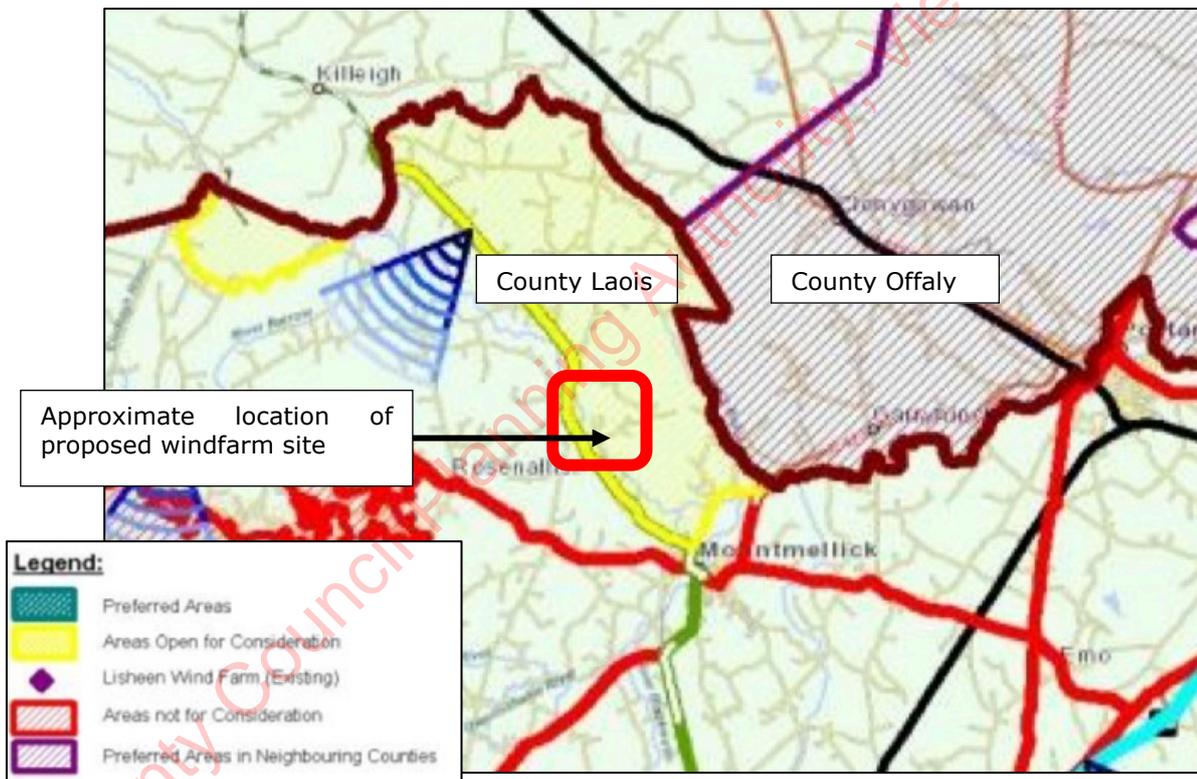
According to the Strategy, of the aforementioned seven Landscape Character Types (LCTs) identified for the county:

*"The main areas that were under consideration for wind energy development during the last county development plan were mainly in the following landscape type areas: Hills and Upland Areas; Peatland Areas; Rolling Hill Areas."*

As the salient landscape character of the central study area is characterised, in part, by LCT 5: Peatland Areas, this area's potential suitability for wind energy assessment is referenced in the Strategy. However, the Strategy only repeats the characteristics of that LCT that were previously set out in the Landscape Character Assessment, and which are referenced above (i.e. "Land cover is raised bog, much of which is now exhausted and being considered for alternative uses including afforestation, amenity and wind energy").

In the Strategy, the potential suitability of County Laois for wind energy generation is subdivided into four distinct area classifications. The site of the proposed windfarm is located within an "Area open for consideration" (see Figure 11.7, below), which is described as:

*"Having regard to the landscape character assessment policies, amendments have been made to the areas to reflect these policies. Applications in these areas will be treated on their merits with the onus on the applicant to demonstrate why the development should be granted permission."*



**Figure 11-7: Extract of 'Map – Wind Energy Classified areas' from 'Figure 1: Pre-draft Wind Energy Map as presented to the Elected Members,' from Laois CDP Chief Executive's Report, September 2017, showing the site of the proposed windfarm located within an "Area open for consideration."**

11.3.4.4 Offaly County Development Plan (2014 – 2020)

The proposed development fringes the border of County Offaly, and so its county development plan (CDP) is considered in this section. The Offaly CDP does not contain a Landscape Character Analysis, but objective LAO-04 states that; "It is an objective of the Council to investigate the feasibility of preparing a Landscape Character Assessment during the lifetime of this plan".

Nonetheless, a classification of landscape sensitivity for various landscape types is provided. This utilises three sensitivity categories: high, medium and low.

**Low Sensitivity areas** relates to “rural and agricultural areas,” and entails:

Characteristics:

*County Offaly is largely a rural county, which comprises of a predominantly flat and undulating agricultural landscape coupled with a peatland landscape. Field boundaries, particularly along roadside verges, which are primarily composed of mature hedgerows, typify the county’s rural landscape.*

Sensitivities:

- *These areas in general can absorb quite effectively, appropriately designed and located development in all categories (including: telecommunication masts and wind energy installations, afforestation and agricultural structures).*
- *Due to the rural nature of the area, development shall be screened by appropriate natural boundaries that are sympathetic to the landscape generally, where possible.*
- *New housing proposed should respect the Councils rural housing design guidelines, coupled with conformity with development standards.*

**Moderate Sensitivity Areas** relates to “cutaway bog,” and entails:

Characteristics:

*Cutaway bogs cover a large part of the landscape of Offaly and in their entirety, are approximately 42,000 hectares. There are a number of land uses for cutaway bog, which include wilderness, grassland, forestry and recreation. Some cutaway bog landscapes are more robust and may be considered for other uses.*

Sensitivities:

- *The development of Lough Boora (designated as high sensitivity) acts as a prototype in the creation of parkland character.*
- *However, some of these cutaway bogs may be appropriate for other sensitively designed and located developments including renewable energy (wind farms, biomass crops) and/or industrial use.*
- *The Council recognises the need for a land use plan for the future development and utilisation of large areas of cutaway bog within Offaly.*

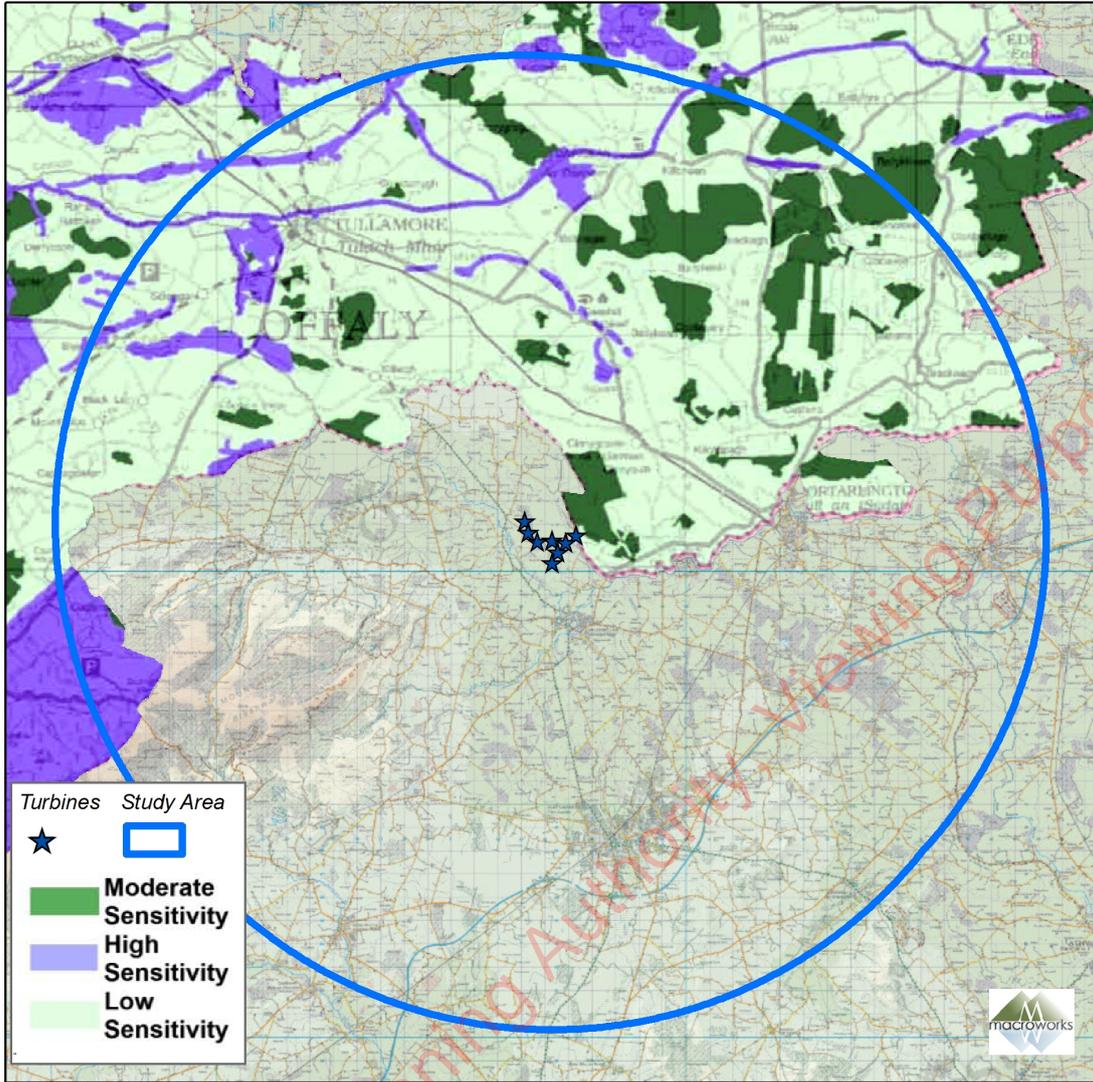


Figure 11-8: Extract of Map 7.15 Landscape Classification from the Offaly CDP

According to Map 7.7 of the CDP, which is based on 2000 Corine Data, the bog aligning the County Laois border, and which lies adjacent to the site of the proposed windfarm, is "Raised Bog Exploited." It should be noted that the central study area (i.e. within 5km of the site) that is within County Offaly is a mix of cutaway bog and rural/agricultural areas.

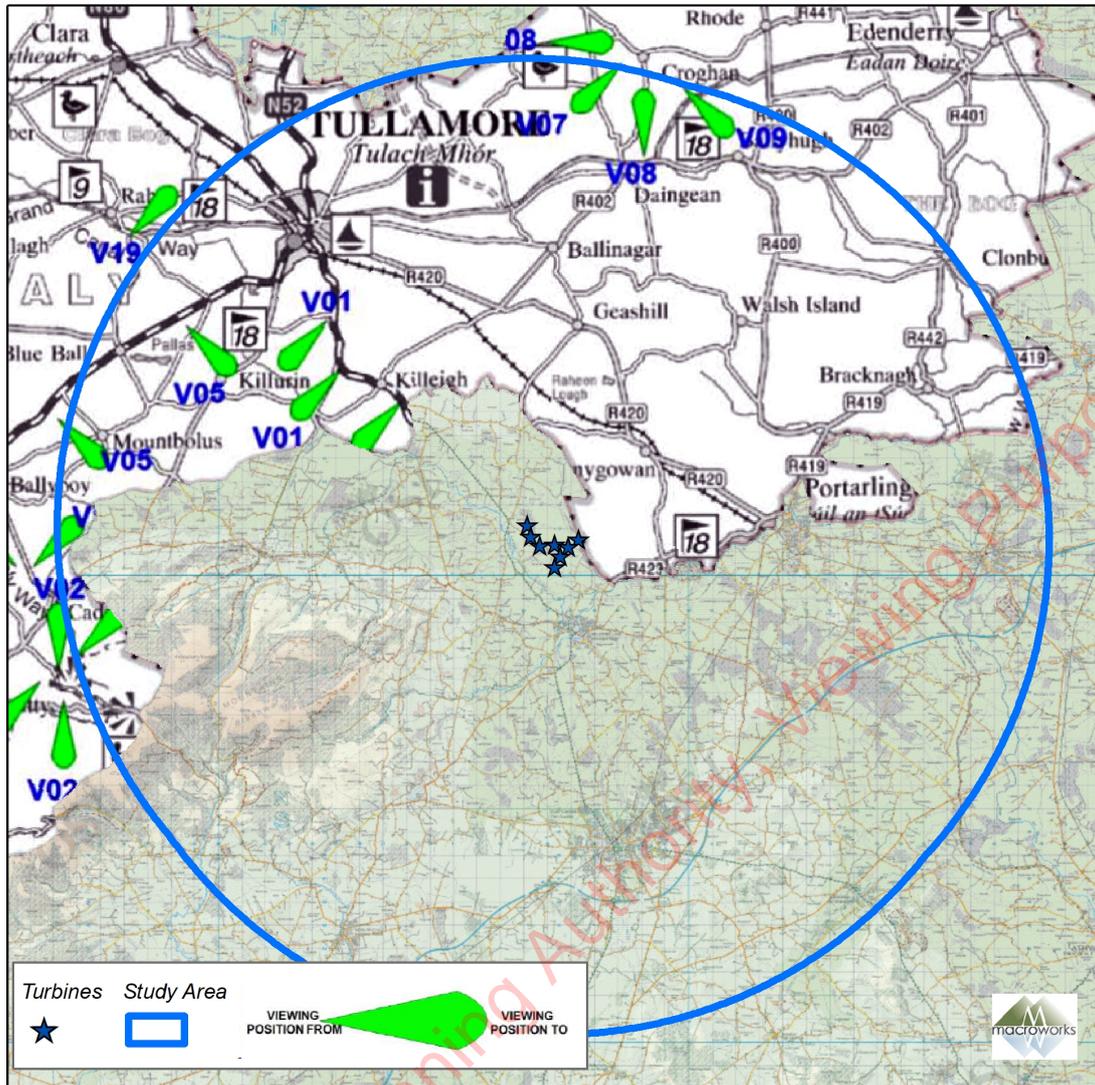


Figure 11-9: Extract of Map 7.18 Protected Views from the Offaly CDP

With regard to designated views and prospects within Offaly, its CDP states that:

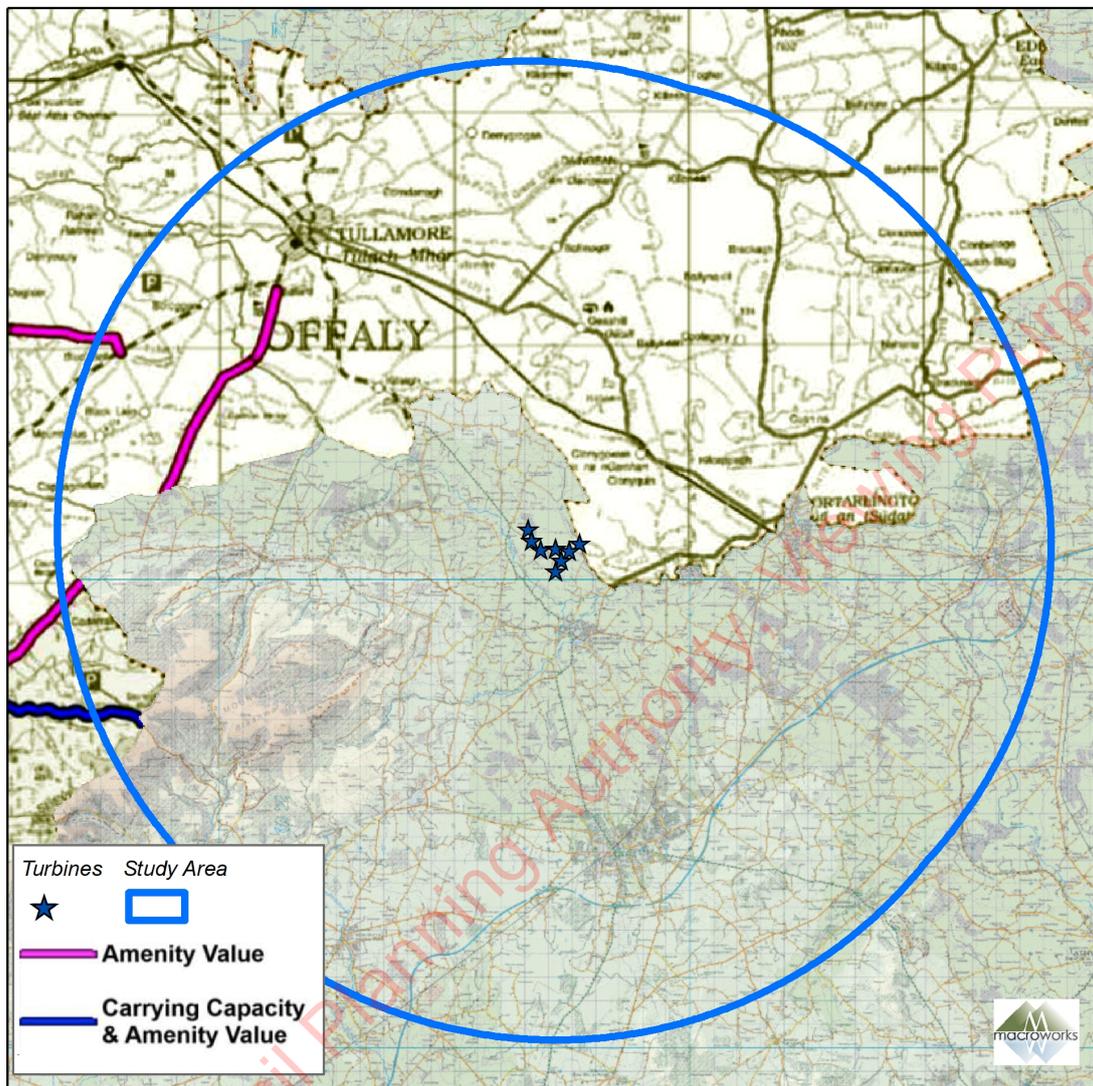
*"The designation of Areas of High Amenity and scenic amenity routes within County Offaly provide a basis for the protection of views and prospects of certain visually vulnerable features. However, there may be a number of individual views and prospects which warrant protection within the county."*

Of the 19 designated views and prospects listed in Table 7.11.5 of the Offaly CDP, only one is of potential relevance to the proposed development (i.e. a view/prospect that is within the study area, but which has the potential for views in the direction of the site). This is V5, which is a view from the "N52 in the townland of Heath, Bunaterin, Derrydolney, Ballywilliam, Curraghmore, Ballynacard, Bally na Curra," and a view to the Slieve Bloom Mountains. In the subsequent Visual Impact Assessment section of this report, VP17 is representative of this designated view.

According to Map 7.19 'Scenic Routes' in the CDP, there is only one scenic route in the study area that is of relevance to the proposed development. This runs from south of Tullamore, in a southwest direction until it meets the Laois county border.

*R440 and R421 Birr to Kinitty and Ballard to Kinitty: This route provides an attractive drive within the open countryside to the attractions of the Slieve Bloom Mountains and around the foothills of the mountains themselves.*

In addition, there is no designated 'Areas of High amenity' within approx. 7km of the site of the proposed development.



**Figure 11-10: Extract of Map 7.19 Scenic Routes from the Offaly CDP**

Relevant landscape and amenity policies and objectives in the Offaly CDP include:

- **LAP-02:** It is Council policy to control development as per the county's landscape classification listed in Tables 7.11.1-7.11.4
- **LAP-04:** It is Council policy that existing local features, including hedgerows, shelter belts and stone walls are retained, protected and enhanced where appropriate, so as to preserve the local landscape and character of an area, whilst providing for future development.
- **LAP-05:** It is Council policy to protect the landscape comprising the River Shannon and flood plain including the callows and views of special interest from inappropriate development. However, appropriate development within settlements adjacent to the Shannon and its callows and which act as focal points for both residential and commercial / business, industry and recreation will be positively considered.
- **LAP-06:** It is Council policy that new development should ensure the protection of mature trees, hedgerows and the conservation of existing stone walls, and their integration into new development. Where the provision of new boundaries is required, these should comprise native hedgerow planting of Irish provenance, or stone walls which consist of stone found in the locality.

Where comprehensive new development occurs, it should take into account the pattern of existing hedgerows and incorporate same into layouts or plant connecting hedgerows where hedgerow removal to facilitate development works is necessary. The Council will require that all new development will respect the existing character of the settlement, in particular through the provision of sensitive landscaping schemes. In the event that the removal of tree(s) is deemed to be necessary, it will be generally conditional on replacement with appropriate species.

- **LAO-01:** It is an objective of the Council to preserve and enhance the character of the county's landscape where, and to the extent that in the opinion of Offaly County Council, the proper planning and sustainability of the area requires it.
- **LAO-02:** It is an objective of the Council to preserve scenic views and prospects throughout the county, which will be assessed on a case-by-case basis, as part of the development management process. (Views are listed in Table 7.11.5 and shown on Map 7.18).

### Wind Energy Strategy

A Wind Energy Strategy has been prepared for Offaly, which forms part of the County Development Plan. Section 3 entails 'Consideration for Evaluation of Wind Energy.' Figure 3 ('Exploited Raised Bogs') of that section is based on the aforementioned 2000 Corine Data, and shows an exploited raised bog aligning the County Laois border, adjacent to the site of the proposed windfarm. It states that:

*"It is important to note that many of the lowland areas marked 'transitional woodland scrub', 'agricultural land with natural vegetation' and 'coniferous forestation' are in fact areas of cut-over bogs that have become re-vegetated [...] These areas generally have visually degraded landscape character, very low levels of residential settlement and large landholdings which give them a high potential for the development of windfarms – while avoiding conflicts with neighbours or scenery."*

In Section 3.3 ('Landscape Sensitivity') of the Strategy, it states:

*"County Offaly's landscape consists of an east-west broad shallow corridor with little large-scale enclosure. The Slieve Bloom Mountains dominate the skyline along the southern edge of the County. Features of landscape and amenity significance are mostly small scale and located within broad, relatively flat landscapes with limited potential visually absorb larger structures – such as wind turbines."*

*"It is conservatively assumed that wind turbines are significantly visible from a distance not exceeding 10km. As the distance between viewing location and wind turbines expand, the prominence decreases. The size, shape and topography of Offaly mean that in practice any windfarm development will be visible over most of the County. However, for evaluation purposes it has been assumed that at distances in excess of 2km, the turbines will not be visually dominant – and this has been used as a set-back distance from visually sensitive features for analytical mapping purposes [...] The buffer zones are an additional consideration in helping to identify the wider areas that could be considered suitable for wind energy development that is part of the overall methodology."*

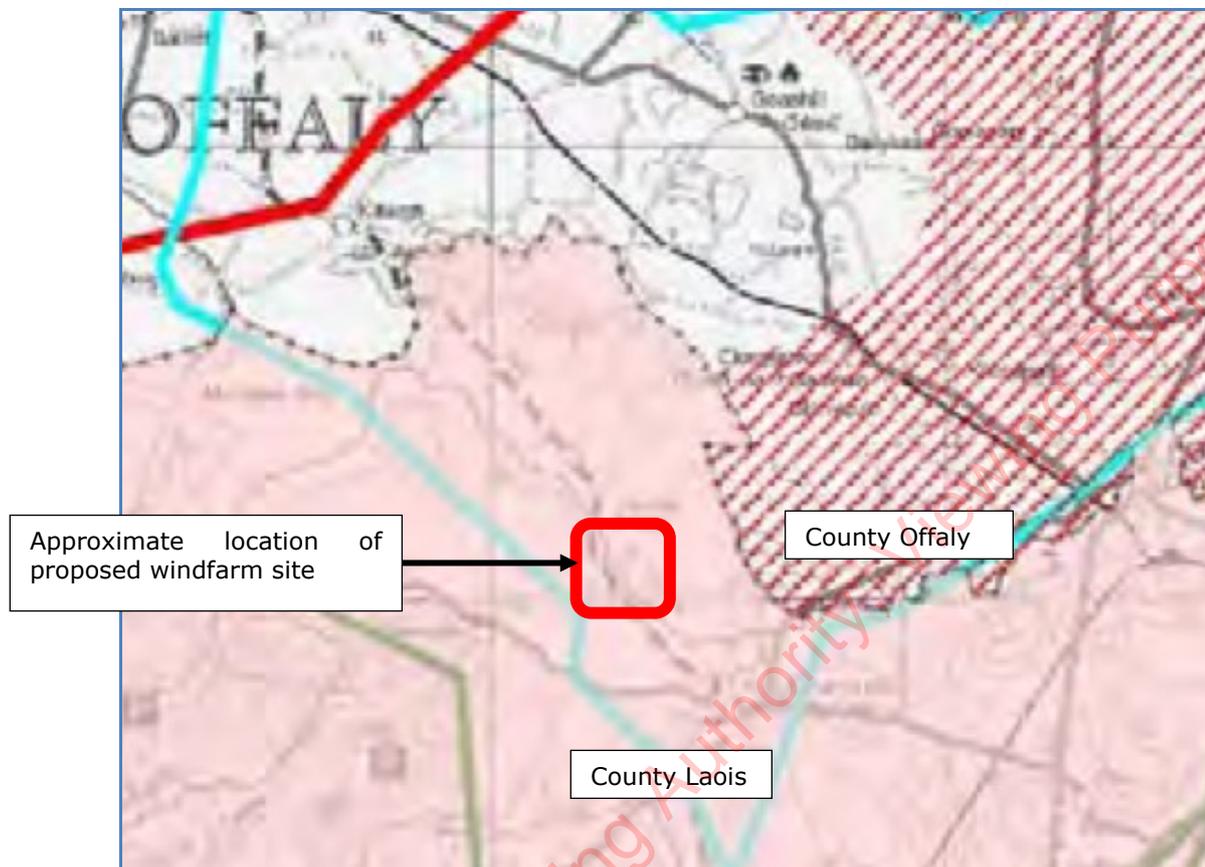
In Section 4 ('Analysis of Suitable Areas in County Offaly for Wind Energy Development') of the Strategy, Table 1 demonstrates the 'Results of Field Analysis of Potential sites for Wind Energy Development,' which seeks to establish areas of wind energy development potential in the county. Of the 12 main areas in the county that were assessed for wind energy development potential, Area 2 is that which occupies the central study area. The considerations for Area 2 are:

*"Having regard to the very low levels of existing dwellings, large land holdings reasonable access to grid, reasonable road access and existing cut-over bogs this area is suitable for large scale windfarm development."*

Thus, the decision for this area is:

*"Core areas of cutover bog suitable for windfarms. Scope for more dispersed clusters of smaller developments over the remainder of the area."*

The factors that deem specific areas of County Offaly suitable for windfarms include: available access to suitable grid connections; the absence of overwhelming environmental constraints; and low densities of adjacent residential development. Applications for wind turbines in these areas are acceptable, in principle.



**Figure 11-11: Extract of Figure 9 of the Offaly Wind Energy Strategy (hatched red line area indicates suitable wind energy development zone)**

#### 11.3.4.5 Kildare County Development Plan (2017 – 2023)

Within the eastern periphery of the study area, there are five scenic viewpoints, but no scenic routes. The five Kildare County designated scenic viewpoints align either the Grand Canal or the River Barrow, within and in the broader area of Monasterevin. These are low-lying locations, all of which have no potential for longer distance views in the direction of the site, mostly owing to tall vegetation and built development. In addition, the protected view from these locations is that of the watercourse itself (i.e. the barrow River or the Grand Canal from along their bridges and/or adjacent lands and roads), rather than views of any further than a few hundred metres, at the very most.

The scenic viewpoint that has the best potential for longer distance views in the direction of the site is RB9, located on a bridge over the Barrow River northwest of Monasterevin, at the boundary between Counties Kildare and Laois. The view in question relates to those “of the River Barrow,” rather than any more distant views, and is also the closest viewpoint to the site of the proposed development.

#### 11.3.4.6 Ecological Designations

Ecological designations such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Natural Heritage Areas (NHAs) are relevant to the landscape and visual assessment as they can identify areas that are likely to exhibit naturalistic character and low levels of built development.

They also highlight areas to which landscape conservation values are attached and they are commonly associated with outdoor amenity facilities where people go to enjoy the landscape setting.

There are just two ecological designations within the central study area (i.e. within 5km of the site). The site of the proposed windfarm comes within 120m north of the River Barrow And River Nore SAC (Site Code 002162). However, the proposed location for all eight turbines is, in each case, always remains more than 800m from this SAC.

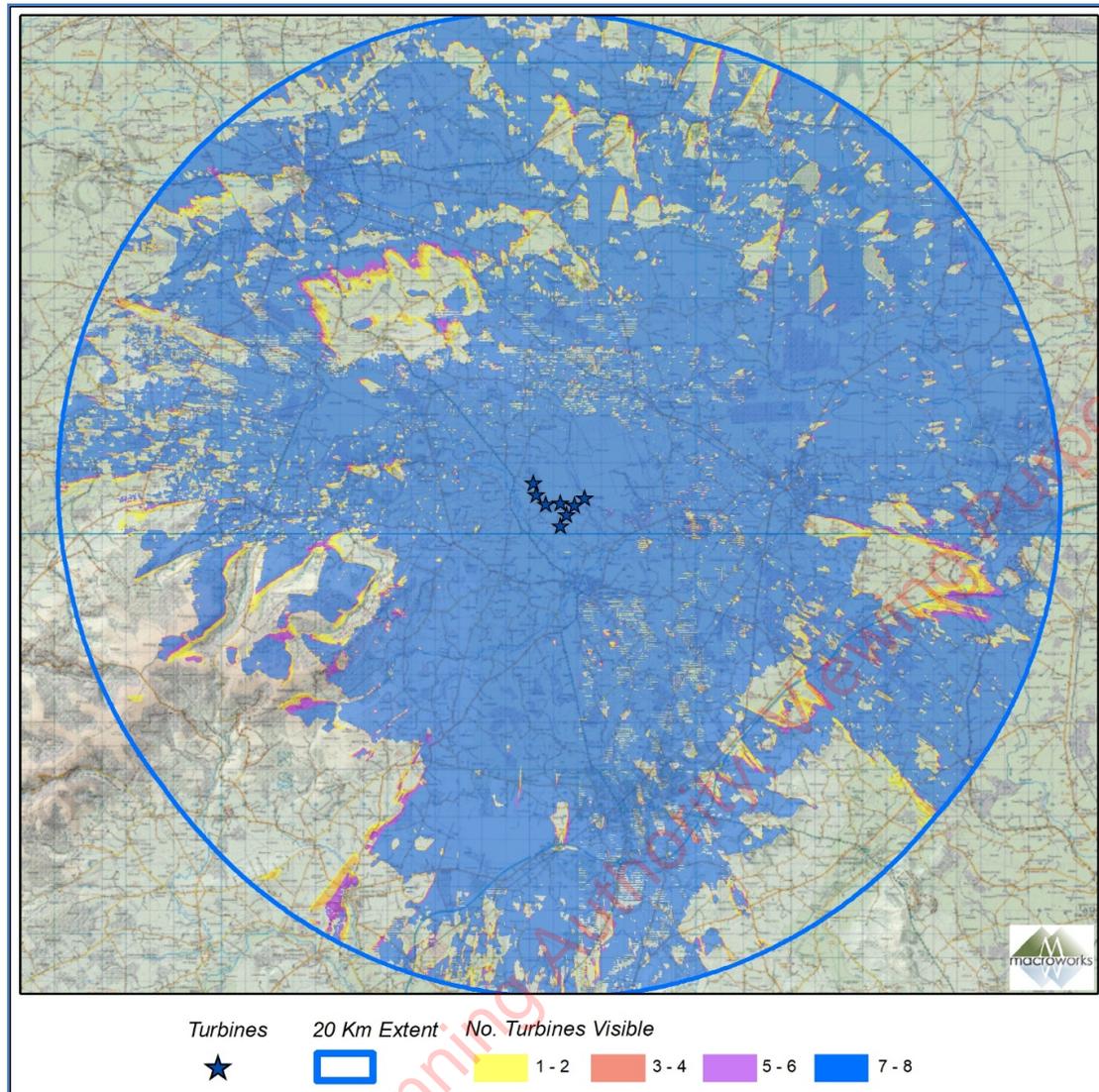
In the second instance, the Slieve Bloom Mountains SPA (Site Code 004160) is located approx. 4.5km southwest of the site. Consequently, the proposed wind farm will have very limited potential to significantly influence the landscape setting of these naturalistic habitat areas.

## 11.4 Visual Baseline

The visual baseline for this wind farm proposal establishes both the nature of visibility within the study area and the important receptor locations from which the development might be viewed.

### 11.4.1 Zone of Theoretical Visibility (ZTV)

Only those parts of the study area that potentially afford views of the proposed wind farm are of interest to this part of the assessment. Therefore, the first part of the visual baseline is establishing a 'Zone of Theoretical Visibility' (ZTV). A 'Zone of Theoretical Visibility' ZTV map is a computer-generated resource used to identify the 'theoretical' extent and degree of visibility of turbines. This is a theoretical exercise because it is based on topography alone and does not allow for intermittent screening provided by, for example, hedgerows, forests or buildings. Thus, the ZTV map represents a 'worst-case-scenario' with respect to visual exposure. For the purposes of this project, a radius of 20km (i.e. the study area) was used for the ZTV.



**Figure 11-12: ZTV map for Dernacart Wind Farm (See Appendices 14.2 for full scale annotated ZTV maps generated from hub height and blade tip)**

The following key points should be noted from the ZTV map:

- There is relatively consistent ZTV coverage within 5km of the site, as would be expected due to the flat nature of the central study area.
- ZTV coverage becomes more sporadic beyond 10km in all directions, particularly to the southwest, beyond the Slieve Bloom Mountains, as well as to the southeast towards Stradbally and to the northwest near the settlement of Killeigh. This relates to the relative height of the proposed turbines at increasing distances within this undulating landscape. This intermittent ZTV pattern at 10-20km from the site indicates that turbine visibility is not afforded from all low-lying ground, and even from some higher ground, and is likely to be restricted to blades sets on the horizon, where intervening vegetation permits.
- In terms of settlement, the towns of Mountmellick, Monasterevin, Portlaoise and much of Tullamore experience theoretical visibility of all of the proposed turbines, while the settlements of Mountrath and Stradbally do not.
- In terms of transport routes, the major roads in the study area (i.e. a motorway, three National roads and several regional roads), as well as two rail lines, experience theoretical visibility of all the proposed turbines.

- Where potential visibility occurs, it tends to relate to all of the proposed turbines. Only a small proportion of the ZTV pattern shows partial visibility of the development and this highlights the combination of a generally flat landscape and the consolidated cluster of turbines.
- The most important point when considering the ZTV map in a flat to mildly undulating area such as this is that it is not a true representation of visibility as it takes no account of the screening provided by vegetation. This can be considerable and may limit views of even tall turbines within very short distances. The main benefit of the ZTV map in this instance is to indicate where views of the turbines are definitely not available.

#### 11.4.2 Route Screening Analysis (RSA)

In a flat landscape, such as that of the central study area, which incorporates a network of hedgerows, scrubby bog fringe woodlands and forest plantations, a standard ZTV map is of little value in understanding actual visibility. That is, it grossly overestimates visibility compared to an open peatland or mountain moorland landscape, for example.

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 development. 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. In order 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.

Along this 5km route, each frame is presented in conjunction with a synchronised three-dimensional model of the scheme within a digital terrain context. As a result, a relatively accurate estimate can then be made for each frame, as to which of three possible visibility scenarios the viewpoint falls into. These categories are: 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 a single turbine is afforded. 'Partial visibility' is the most ambiguous of the three categories and can occur in three possible ways: the clear view of less than a full blade rotation of any particular turbine; the veiled view of turbines through light vegetation (typically winter vegetation); or a fleeting open view of a turbine/s such as might be experienced passing a gateway.

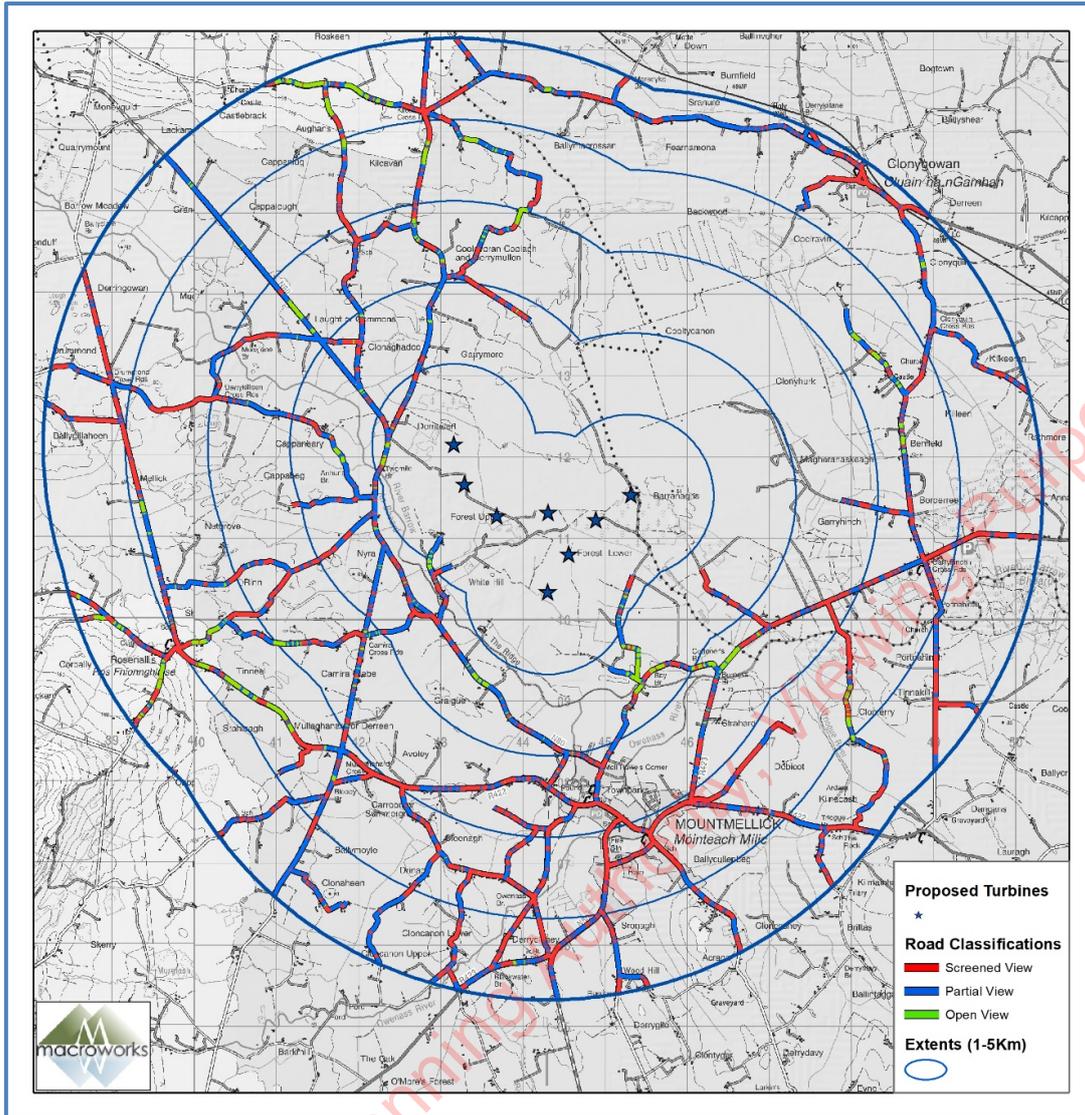


Figure 11-13: Map of Route Screening Analysis (See Volume 4 for larger scale map)

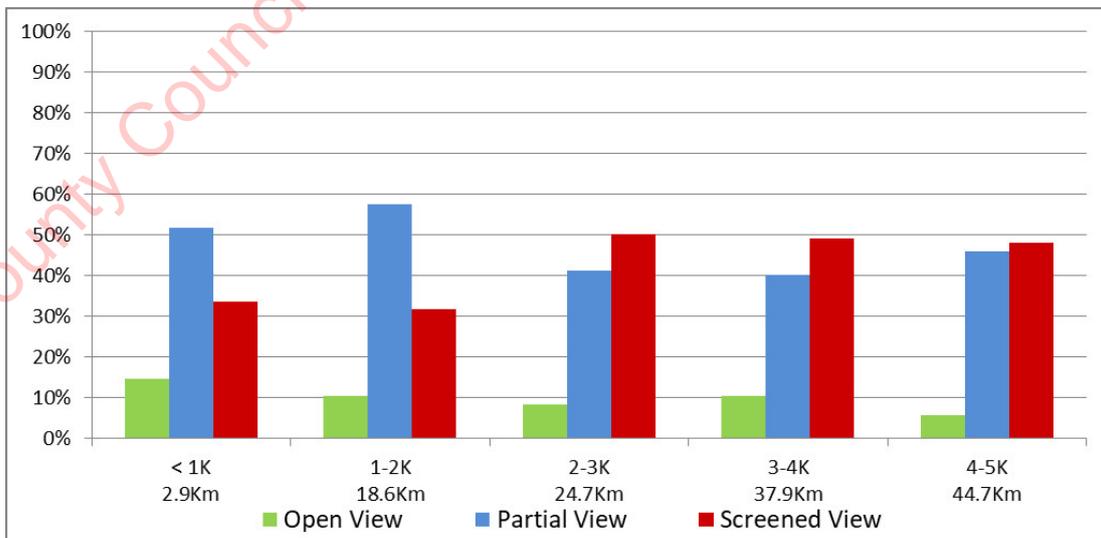


Figure 11-14: Graph illustrating results of Route Screening Analysis

### Results of Route Screening Analysis

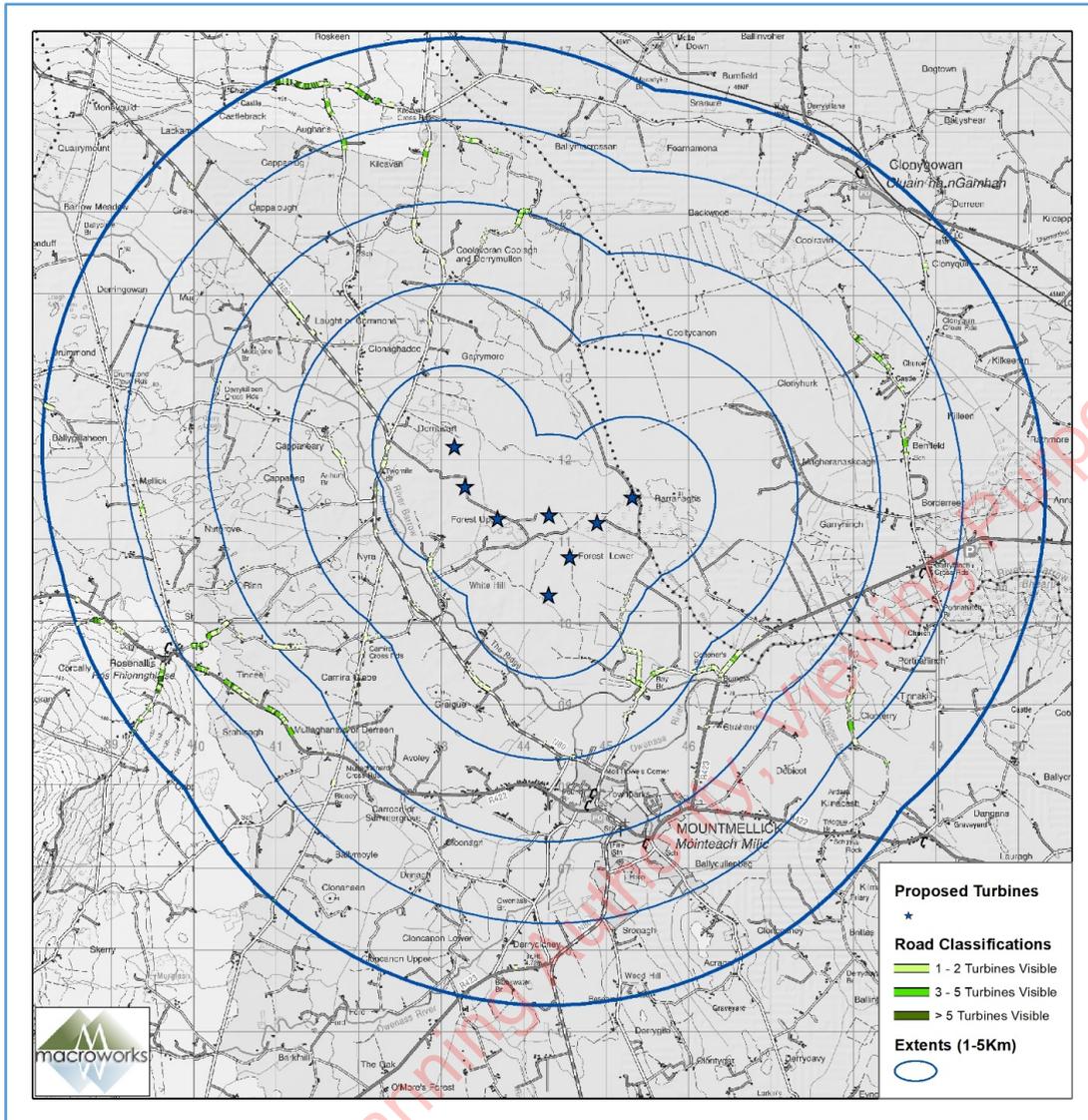
The RSA map (Figure 11.13) and associated graph (11.14) illustrates a moderate to strong degree of wind farm screening from the local road network within 5km of the proposed development. It is worth noting that there is only 2.9km worth of roads within 1km of the scheme, but that alone highlights the robust siting of this development within a sparsely populated peatland/forestry/fringe farmland area. Whilst the quantum of road network increases more than six-fold within the 1-2km distance band, the visibility trend remains broadly similar to the nearest band. Interestingly, between 2-5km, views in all three categories remain largely similar. These results will be assessed further within the spectrum of the three aforementioned categories, and how they may relate to their distance from the proposed turbines. Furthermore, an additional figure and graph will be presented to help assess open views from roads in a more detailed and accurate fashion.

#### Screened Views:

In terms of screened views, these fluctuate from 32% to 50%. Notably, this includes large sections of the R423, as well as the vast majority of the largest and second largest settlements in the central study area: Mountmellick and Clonygowan. Overall, screened views are more likely to occur in the south and west of the study area, though these areas do account for the greatest number of roads in the central study area. Interestingly, after approx. 3km distance from the turbines, there is little material difference in the preponderance or efficacy of these screened views. Put another way: after approx. 3km from the proposed turbines, screened views in the central study area do not increase.

#### Partial Views:

Overall, partial views account for the most views from roads in the central study area. As there are such a wide variety of reasons that can influence or determine this category, it is more challenging to pinpoint the reasons behind this. Overall, partial views range from 40% to 58%, but there is little consistency in the pattern emerging: at 1-2km distance, they lift to approx. 58% of roads; they then drop (at 2-4km distance) to about 40% of roads, before modestly lifting again at 4-5km from the proposed turbines. Partial views are also dominant along the N80. However, whilst such routes collectively transport a substantial number of vehicle-borne receptors, major routes are generally not considered to be sensitive visual receptors.



**Figure 11-15: Map of Route Screening Analysis for open views (See Volume 4 for larger scale map)**

**Open Views:**

Beyond 1km, open views drop from 14% to 10% of roads, beyond which (i.e. from 2-5km) they do not lift above 10%. When factoring in that there is less than 3km worth of road within 1km of the scheme, on average, less than 10% of views from roads in the central study area will be open. Where open views of the proposed turbines do exist, they tend to be located within small pockets, or clusters, that do not necessarily relate to their distance from the turbines. In other words, they are as likely to appear at 1-2km from the site as 4-5km.

In some instances, such as near Rosenallis in the southwest of the study area or near Castlebrack in the far north of the study area, this is due to marginally elevated land along such roads. In other instances, such as approx. 2km southeast of the proposed turbines, a lack of roadside hedgerow or vegetation accounts for such open views. Crucially, there are no open views from the largest and second largest settlements in the central study area: Mountmellick and Clonygowan.

When assessing open road views in more detail (see Figure 11.15, above, and 11.16, below), it is notable that from 0-3km distance from the proposed turbines, over 90% of such road views entail only 1-2 turbines, while for 3-5km distance, over 50% of such road views entail only 1-2 turbines. This is a distinctively low scale of open views of turbines for a proposed windfarm.

At the same time, open views of five or more turbines do not occur at all within 3km of the proposed turbines, and where they occur at 3-5km distance, they average out at approx. 10%. Meanwhile, open views of three to five turbines do not occur at all within 1km of the proposed turbines and remains at less than 10% of road views from 1-3km distance. From 3-5km distance, open views from roads drop from approx. 35% to approx. 25%.

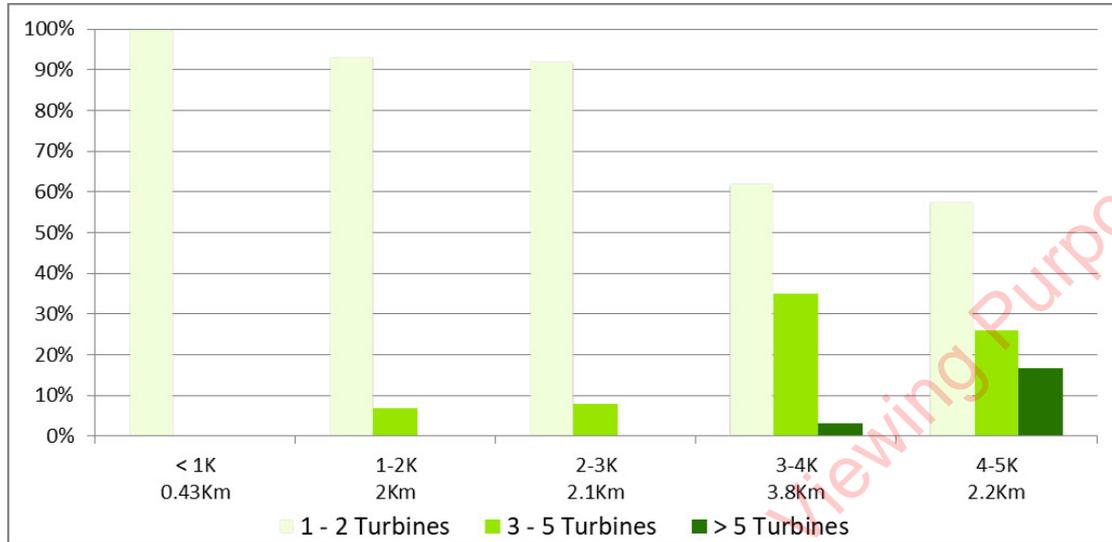


Figure 11-16: Graph illustrating RSA results for open views

### 11.4.3 Visual Receptors

#### Centres of Population and Houses

There are many settlements within the study area, which are, for the most part, evenly spread across the three counties that occupy it. These will now be addressed based on their relative proximity to the proposed development.

There are three settlements within 5km of the site. Less than 2.5km south of the nearest proposed turbine (i.e. T8) is located the small town of Mountmellick, with a population of just less than 5000 inhabitants. Less than 5km northeast of the nearest proposed turbine (i.e. T6) is the small village of Clonygowan, while approx. 4km southwest of the nearest proposed turbine (i.e. T2) is the small village of Rosenallis. Within the central study area, in all but the northeast quadrant, there is a network of local roads that are stocked with rural residential dwellings. Indeed, there is a relatively dense concentration of rural dwellings and farmsteads lining the local roads that criss-cross the farmed landscape of the study area. By contrast, in the northeast quadrant of the study area, where cutaway peatlands are prevalent, such areas tend to be very sparsely populated and bog fringes are only lightly populated. It is these nearest settlements and the network of local roads within 5km of the proposed site that will form the focus of the visual impact assessment on the local population.

In terms of settlements between 5-10km from the proposed turbines, while there are a low number of small villages (e.g. Geasehill, Killeigh), the only town is that of Portarlinton, with just over 8,000 residents, located 9km east of the nearest proposed turbine (i.e. T6).

Most settlements in the study area are located more than 10km from the proposed windfarm, with the most sizeable being Portlaoise, approx. 12km south of the nearest proposed turbine (i.e. T8). A town of 22,000 inhabitants, Portlaoise is also the largest town in the Irish midlands. Approx. 15km northwest of the nearest proposed turbine (i.e. T1) is the County Offaly town of Tullamore (approx. 14,000 inhabitants), while approx. 17km east of the site is the Kildare town of Monasterevin (approx. 4,000 inhabitants). Approx. 18km southwest and southeast of the site are the County Laois towns of Mountrath (approx. 1600 residents) and Stradbally (approx. 1800), respectively. For such settlements located more than 10km from the site of the proposed windfarm, a combination of considerable viewing distances, the very restricted nature of visibility (if it occurs at all) and the sensitivity of these receptors will preclude significant visual impacts from occurring at all of these settlements, and thus it is not deemed necessary to consider them further within this appraisal.

### Transport Routes

The M7 is the major transport route in the study area and runs approx. 12km southeast of the nearest proposed turbine (i.e. T8), connecting Limerick and Dublin cities. There are three National roads in the study area: the N77, the N52 and the N80. A section of the N80 connects Mountmellick to Tullamore and runs to within 800m west of the nearest turbine (i.e. T1). The M7 motorway and these three national roads tend to be connected by a web of regional roads. Those regional roads that enter within 5km of the proposed turbine locations are the R423 and R422 (within 2.3km southeast and southwest of the nearest turbine, respectively), as well as the R420, which enters to within 4.8km northeast of the nearest proposed turbine (i.e. T6). There is a variable network of third class roads in the study area; variable in the context of being sparse or non-existent in some locations (e.g. in the vicinity of the vast cutaway bogs of the northeast central study area, or the Slieve Blooms), while being considerably more fluent and condensed in lowland farming terrain.

The national rail network radiates from Dublin and enters the eastern flank of the study area, where it diverges at Portarlinton. Southwest of Portarlinton, the Dublin-Cork main line enters to within 8km southeast of the nearest turbine location (i.e. T8), while the Galway/Mayo line enters within 5km northeast of the nearest proposed turbine (i.e. T6).

### Amenity and Heritage Locations

While there is a diverse array of amenity and heritage locations within the study area, these are limited within the central study area, and are absent from within 2km of the location of any of the eight proposed turbines.

Those locations/attractions located 2-5km from any of the proposed turbine locations include the grounds of Mountmellick United FC, Mountmellick GAA club, The Rock GAA club, the Kilcavan GAA club and the Garryhinch Loop Walk, which is enclosed in mature woodland, more than 4km from the site of the proposed windfarm.

Outside of the central study area, there are a number of amenity and/or heritage features that are at least regionally renowned. There are a number of waymarked trails traversing the Slieve Bloom mountains, chief among them being the Slieve Bloom Way, which enters to within 8km southwest of the nearest proposed turbine. The Rock of Dunamase is located almost 15km southeast of the nearest proposed turbine (i.e. T8). The ruined 12th Century castle sits upon a rocky outcrop 46m above the Midlands plain, and is a defensive stronghold dating from the early Hiberno-Norman period, offering compelling and panoramic views of the surrounding terrain.

One of the key public recreational facilities within the central study area is the Grand Canal Way, which runs along the towpath of the Grand Canal, approx. 14km north of the location of the nearest proposed turbine (T1). Within the study area, this historic transport route links Tullamore with the village of Daingean, on its journey west from Dublin towards the Shannon. Emo Court Demesne and Stradbally Hall are located approx. 10km and 19km, respectively, southeast of the nearest proposed turbine (i.e. T8).

Apart from across the aforementioned Slieve Blooms, there are a number of walking trails in the study area. The only one that is within the central study area, but is not a National Waymarked Trail, is the Mountmellick Slí: a 6.9km road-based walk, starting and ending in Mountmellick. Located within the stately grounds of Emo Court Demesne, the Emo Slí is a 4.3km, woodland-based walking trail more than 8km from the site of the proposed windfarm. The woodland walks through Togher Woods, southwest of Portlaoise, are located more than 14km from the site, as is the Barrow Way, located in the eastern fringe of the study area. In the northeast quadrant of the study area, Bord na Mona have created 7km of public walkway-cycle way around the 28-turbine Mount Lucas windfarm, approx. 13km northeast of the of the proposed development

While there are several golf clubs and courses in the study area, none are within the central study area. The closest is Portarlinton Golf Club, which is located 5-6km from the nearest proposed turbine (i.e. T6), with other courses/clubs in the study area including The Heath and The Heritage.

Visibility of the scheme has been investigated through desk studies and/or fieldwork from all of the amenity and heritage features outlined above and, where relevant and available, these views are included for assessment herein.

*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, websites, guidebooks, and roadside rest stops, or on post cards that represent the area. In this instance there are not considered to be any iconic views that are not otherwise included as designated scenic views in the relevant county development plans.

## 11.4.3.1 Laois County Development Plan (2017 – 2023)

The Laois County Development Plan contains a number of designated scenic views and prospects. However, most are neither within the study area, while several of those that are in the study area are not orientated in the direction of the site. There are no scenic designations within the immediate vicinity of the site. While one does occur 4-5km northwest of the nearest proposed turbine, this view/prospect ("006 – Grange, Mountmellick"), as indicated in Figure 11.6, is orientated southwest towards the Slieve Blooms, rather than southeast towards Dernacart townland. All other designated scenic views and prospects occur at more than 10km distances from the nearest proposed turbine. The two relevant designated views, which have been included for assessment herein, are included in Table 11.8 below.

**Table 11-8: Relevant Designated Views for Co. Laois**

Designated View No. (from CDP)	Location / description	Represented for assessment herein by
<b>Designated views/prospects</b>		
<b>004</b>	Slieve Bloom Mountains	<b>VP19</b>
<b>005</b>	Rock of Dunamaise	<b>VP2</b>

## 11.4.3.2 Offaly County Development Plan (2014 – 2020)

Of the 19 designated views and prospects listed in Table 7.11.5 of the Offaly CDP, only one is of potential relevance to the proposed development. Similarly, of the two designated scenic amenity routes listed in Section 7.12.2 of the Offaly CDP, only one is of potential relevance to the proposed development.

**Table 11-9: Relevant Designated Views & Scenic Routes for Co. Offaly**

Designated View No. (from CDP)	Location / description	Represented for assessment herein by
<b>Designated views/prospects</b>		
<b>V5</b>	N52 in the townland of Heath, Bunaterin, Derrydolney, Ballywilliam, Curraghmore, Ballynacard, Bally na Curra.	<b>VP17</b>
<b>Scenic Amenity Routes</b>		
<b>R440/R421</b>	R440 and R421 Birr to Kinitty and Ballard to Kinitty: This route provides an attractive drive within the open countryside to the attractions of the Slieve Bloom Mountains and around the foothills of the mountains themselves.	<b>VP16</b>

#### 11.4.3.3 Kildare County Development Plan (2017 – 2023)

There are a number of designated views from County Kildare contained within the wider study area. However, based on viewing distances, view orientation, the described prospect of the view and level of intervening screening, none of these are deemed to be relevant to this assessment. One exception is 'RB9' from the Kildare County Development Plan (2017-2023), which is located on a bridge over the Barrow River northwest of Monasterevin, at the boundary between Counties Kildare and Laois. The view in question relates to those "of the River Barrow," rather than any more distant views. Although over 13km from the nearest proposed turbine, it is also the closest designated Co. Kildare viewpoint to the site of the proposed development. In the subsequent Visual Impact Assessment section of this report, VP13 is representative of this scenic viewpoint.

#### 11.4.4 Identification of Viewshed Reference Points as a Basis for Assessment

The results of the ZTV analysis provide a basis for the selection of Viewshed Reference Points (VRP's), which are the locations used to study the landscape and visual impact of the proposed wind farm in detail. It is not warranted to include each and every location that provides a view of this development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the project. Instead, a variety of receptor locations were selected that are likely to provide views of the proposed wind farm from different distances, different angles and different contexts. The visual impact of a proposed development is assessed using up to 6 categories of receptor type as listed below:

- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes;
- Amenity and heritage features.

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

##### *Key Views*

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

##### *Designated Scenic Routes and Views*

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

##### *Local Community Views*

This type of VRP represents those people that live and/or work in the locality of the wind farm, usually within a 5km radius of the site. Although the VRP's 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 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 VRP's is necessary in order to sample the spectrum of views that would be available from within the local landscape. It should be reiterated that in this instance that the open views represented in the local community category are not necessarily typical views from the central study area and have been selected as worst-case-scenario views in terms of visual exposure.

*Centres of Population*

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

*Major Routes*

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

*Amenity and Heritage Features*

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

**Table 11-10: Selected Viewshed Reference Points (VRP's)**

VRP No.	Location	Direction of View
<b>VP1</b>	N80, at northern outskirts of Portlaoise	N
<b>VP2</b>	Rock of Dunamaise	NW
<b>VP3</b>	M7 overpass at Junction 15	NW
<b>VP4</b>	Emo Court Demesne	NW
<b>VP5</b>	R419 at western outskirts of Portarlington	W
<b>VP6</b>	Cul de Sac third class road at Garryhinch townland	W
<b>VP7</b>	Housing development at northern outskirts of Mountmellick	N
<b>VP8</b>	Third class road at Forest Lower townland	N/NW
<b>VP9</b>	N80, at Nyra townland	E/SE
<b>VP10a/b</b>	N80, at Grange townland	SE
<b>VP11</b>	Linear residential development at Kilcavan townland	SE
<b>VP12</b>	R420 at Clonygowan village	SW
<b>VP13</b>	Kildare Co. Co. designated view RB9 near Monasterevin	W

VRP No.	Location	Direction of View
VP14	Grand Canal Way at Cappyrore townland	S
VP15	N52 at south-eastern outskirts of Tullamore	SE
VP16	Offaly Co. Co. designated scenic route at Killurin village	SE
VP17	Offaly Co. Co. designated view V5 at N52	SE
VP18	Clonaslee village	E
VP19	Laois Co. Co. designated view 004 at Slieve Bloom Mountains	E/NE
VP20	Northern outskirts of Mountrath town	NE

### 11.5 Potential Impacts

Based on the assessment criteria employed herein, potential significant impacts (i.e. those impacts of significance which may arise prior to consideration of mitigation measures and which, therefore, can be distinguished from residual impacts), are considered most likely to occur in instances where highly sensitive landscape and visual receptors coincide with high order landscape and visual effects (see descriptions in Tables 11.1, 11.2 and 11.4). From previous experience for this type of project in rural settings it is considered that potentially significant landscape and visual impacts have the potential to occur in the following ways.

#### Landscape Impacts

- Irreversible physical effects on sensitive landscape features.
- Disruption of existing land use patterns and/or ecological networks.
- Incongruous change to areas of sensitive landscape character.

#### Visual Impacts

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

In terms of potential landscape impacts, from baseline studies and early stage assessment specific to the proposed Dernacart Wind Farm (as per Section 11.3.4.3), there is no stated or designated sensitivity for each Landscape Character Type (LCT) in the Laois CDP. Within the Offaly CDP, those landscape classification areas of the county that occupy the central study are a mix of 'moderate' and 'low' sensitivity. The nearest 'high' sensitivity area entails that of an esker ridge, approx. 8km north of the nearest proposed turbine.

The most sensitive visual receptors are likely to be the designated scenic routes and views identified in the County Laois, Offaly and Kildare County Development Plans, which are sensitive receptor locations on the basis that they represent a consensus on scenic amenity. Other highly sensitive visual receptors are those associated with heritage and tourism, such as Emo Court Demesne.

### 11.6 Mitigation Measures

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

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

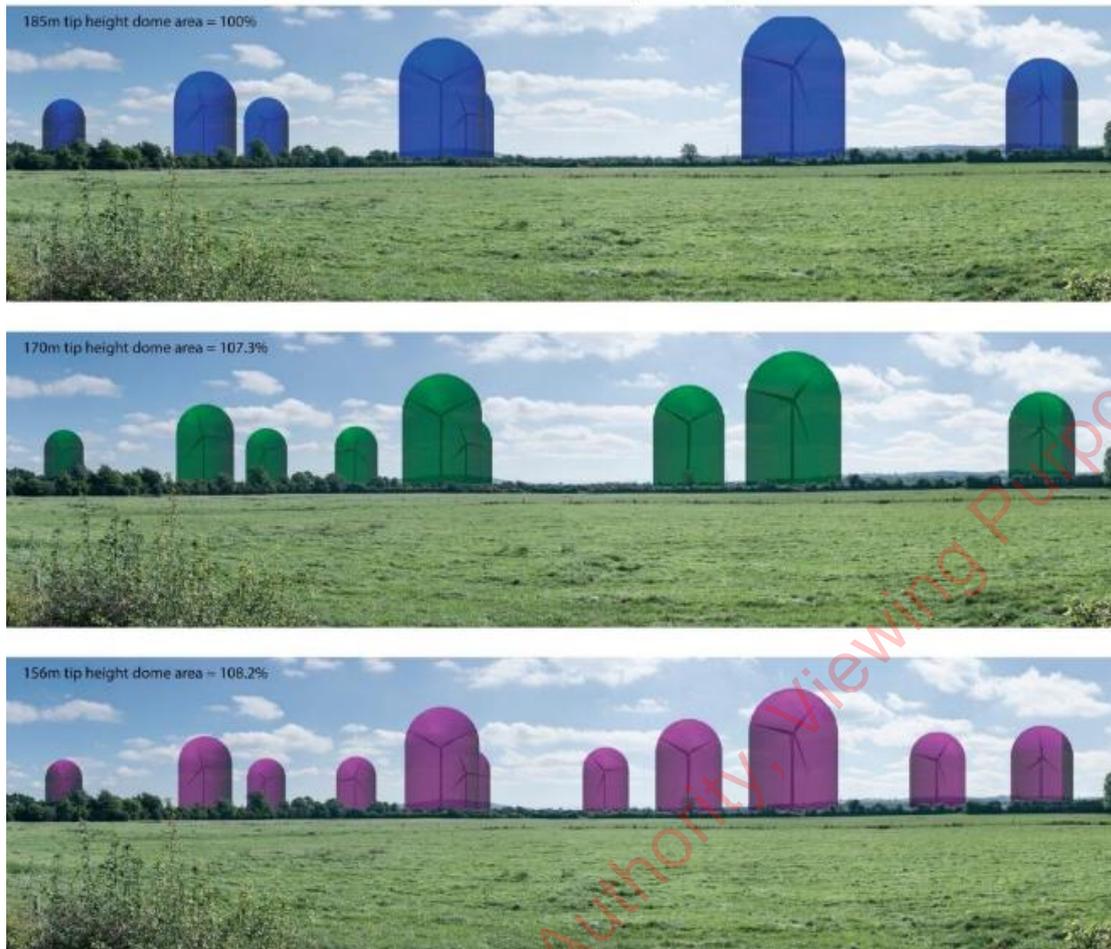
- The use of fewer taller turbines rather than a greater number of shorter turbines (height versus density relationship);
- Consolidation of the turbine layout;
- The buffering of residential receptors;
- The positioning of turbines within, between and in the direct vicinity to existing mature/semi-mature woodland.

#### 11.6.1 Turbine Height versus Density Relationship

The relationship between the height and the density or number of turbines required to achieve a particular power output is a key design consideration. Several case studies and surveys have highlighted that when given an option, people tend to prefer a scenario of fewer larger turbines. One such study commissioned by Bord Fáilte in 2008 found that:

*“In terms of the size and composition of wind farms, tourists tended to prefer farms containing fewer turbines. If both produced the same amount of electricity, tourists also preferred wind farms containing a small group of large turbines (55%) to a large group of smaller turbines (18%).”*

The use of tall turbines as part of a mitigation strategy may seem counter-intuitive, but this is one of the key design attributes of the Dernacart Wind Farm. Firstly, it is important to note that as a starting point, a wind energy development within a lowland setting such as this needs to avail of turbines at the taller end of the range (c. 150m tip height+) in order to be feasible, in terms of wind yield. There is also a balance to be struck between the visual and spatial dominance of turbines and the clutter and frequency of turbines within a view, as both of these effects contribute towards the magnitude of visual impact. On the basis of these factors, and through design stage analysis, it is considered that the slightly increased sense of visual dominance imparted by the proposed 185m turbines is preferable to the reduced level of permeability and increased visual clutter associated with a greater number of shorter turbines required to achieve the same output. This is illustrated in Figure 11.17 below, which compares a similar energy yield across three turbine heights within the same view. This is only intended as an illustrative diagram to show the balancing relationship between turbine height and density.



**Figure 11-17: Turbine height versus density relationship (same power output within view i.e. % relates to the proportion of view occupied by turbines, relative to the largest turbine).**

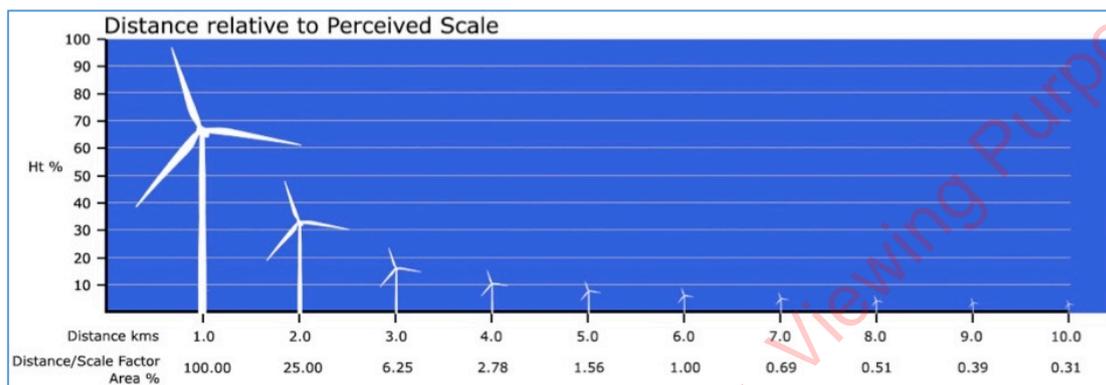
It is considered that the flat nature of the site along with the large scale field pattern, broad peatland area and extensive forest plantations can accommodate tall turbines without undue conflicts of scale. However, even at minimum separation distances of 617m+, tall turbines have a greater potential to dominate the scale of rural dwellings and ancillary structures than shorter turbines. They also have the potential to be more visually overbearing than shorter turbines though "the relationship between visual impact and turbine size is not directly proportional". Nonetheless, turbines with tip heights comparable to those proposed are becoming more commonplace in recent years with 169m turbines now operating at a similar peatland fringe site at Meenwaun in County Offaly. Oweninny Wind Farm (175m tip height) is currently under construction in County Mayo and the Yellow River Wind Farm (166m tip height) and Cloncreen Wind farm (up to 170m tip height) have been granted planning permission in County Offaly.

### 11.6.2 Consolidation of the Turbine Layout

As a low-modest scale development of 8 turbines, the design consolidates the turbine cluster within a single landscape and visual setting contained wholly within the network of local roads. In doing so, the potential for local residents to be exposed to views of turbines on both sides of local roads (as opposed to dead-end farm or forestry tracks), or from more than one or two aspects of their property/dwelling, is almost eliminated. The potentially confusing visual scenario of turbines popping up in different aspects of a view, particularly for those moving through the landscape, is also reduced. Overall, this is likely to reduce landscape and visual impacts.

### 11.6.3 Buffering of Residential Receptors

For the proposed Dernacart Wind Farm, the minimum setback distance from local residences not involved in the project is ca. 790m, which is in excess of the 500m requirement under the current DoEHLG Wind Energy Guidelines (2006). By default, this has resulted in the proposed turbines being placed into a robust receiving landscape of forestry, bog fringes and open farmland. This degree of buffering from residential dwellings is of benefit to several aspects of residential amenity, including noise, shadow flicker and visual impact. In relation to visual impact, it is worth noting that, according to the laws of perspective, the doubling of viewing distance equates to a halving of perceived height. Increasing set back distances has exponential benefit in terms of reducing the potential for overbearing within the first few kilometres, as illustrated in Figure 11.18 below.



**Figure 11-18: Turbine 'scale in relation to distance' relationship**

## 11.7 Residual Landscape Effects

### 11.7.1 Landscape Character, Value and Sensitivity

Effects on landscape character will be considered at both the localised scale of the site and its immediately surrounding landscape, as well as the broader scale of the study area. Landscape sensitivity in this project level LVIA context needs to go beyond the generic measures of sensitivity employed in the county Landscape Character Assessment and focus on the attributes of the proposal. In terms of sensitivity to this proposed wind farm development, the most sensitive landscapes and landscape features are likely to be those that exhibit enclosed, intricate landform and land use patterns, and/or a strong sense of heritage or past times not strongly influenced by modern development. Areas with a strong sense of the naturalistic, or with low levels of built development, are also likely to be sensitive to this wind farm proposal.

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

The proposed turbines will be placed along the marginal south-western and southern fringes of an extensive area of cutaway bog along the Laois/Offaly border. This is something of a transitional area to more productive farmland that contains reverting scrub, marginal farmland and forestry. The cutaway bogs themselves have an almost post-industrial character, evidenced by the linear furrows of the harvesting pattern, whereas the bog fringes have a slightly more naturalistic character of non-harvested peatland with a covering of bog grasses and acid tolerant shrub/woodland species that have been left largely unmanaged. Similar to other locations across the Midlands, the bog fringes also contain geometric conifer plantations, which contrast against the unmanaged scrubland character. Nonetheless, it remains a low intensity land use. It should be noted that the vast majority of the site is located not in peatland, but within commercial conifer plantations and pastoral agriculture, while none of the proposed turbines will be located within 100m of the neighbouring cutaway bog. There is, thereafter, a sharp transition of land use into pastoral agriculture, typically within 300m west and 800m south of the cutaway bog. Other land uses of note within the central study area include Mountmellick town and the village of Clonygowan, as well as recreational woodland (replete with woodland walking trails) at Garryhinch.

Given the peatland nature in the direct vicinity of the site, the landscape of the central study area is particularly flat and there is little enclosure from terrain features within 5km. Instead, a strong sense of enclosure comes from the network of hedgerows and treelines within the farmed landscape and from forestry and reverting scrub around peatland areas. Other than at the edge of cutaway peatland areas, views tend to be contained within a few hundred metres by low vegetated skylines.

Whilst the cutaway peatland areas and their marginal fringes host a very low population density, mainly consisting of occasional farmsteads, some of the local rural roads within the central study area are moderately populated by roadside rural/residential dwellings, as well as the aforementioned settlements of Mountmellick and Clonygowan.

With the exception of the Owenass River and early-stage Barrow River, natural watercourses within the central study area tend to be relatively small in volume and only of corridor width. In this respect, the natural watercourses are similar to the field drains, canals and canal feeders and are not particularly remarkable. Furthermore, there is not a high concentration of built heritage features or demesne landscapes within the central study area. Indeed, the general character of the central study area is that of a working rural landscape contained in both productive and extractive land uses. Consequently, landscape value tends to relate more to sustaining the rural economy and rural lifestyle than to scenic or naturalistic value. This is borne out by there only being one scenic designation within the central study area, but that is more than 4km from the nearest proposed turbine and orientated towards the Slieve Bloom Mountains.

In terms of the landscape designations within the Laois County Development Plan, it is felt that the relevant Landscape Character Areas are appropriately defined and described, although there remains no sensitivity designated to them. Interestingly, as part of a project specific landscape character assessment such as this, the GLVIA 2013 suggests that existing Landscape Character Assessments be considered as a “first step in establishing the landscape baseline” (p77), but not that they be applied directly in determining landscape sensitivity for the specific site context. As is standard practice for LVIA in the UK and Ireland, universal criteria are used by assessors to determine landscape sensitivity of the development site and its surrounding context (refer to Table 11.1). When this criteria is applied to the central study area, it is the Medium / Low criteria that is most applicable.

In relation to wind energy compatibility, in the most relevant Landscape Character Areas within the Laois CDP, it is stated that the suitability for wind energy is to be considered for ‘LCT 5: Peatland Area,’ but is not referenced – in terms of either suitability or unsuitability (as some regions of the county are identified) - for “LCT2: Lowland Agricultural Areas.” More importantly, the study area is located within Laois in an “Area open for consideration” to wind energy development. However, just over the County Offaly border, which marks the eastern boundary of the site of the proposed development and which shares near-identical landscape characteristics, the landscape is deemed to be “suitable for wind energy development.”

Overall, it is considered that the central study area is a robust, highly-modified and productive rural area without a high degree of distinction or uniqueness. The land use pattern is broad and only marginally productive in some areas and yet there is little sense of the naturalistic. Landscape value tends to relate to supporting the local rural economy rather than scenic, recreational or naturalistic values. Other than the town of Mountmellick in the south of the study area, land uses tend to be of a relatively low level of intensity, and this is complimented by a similarly low level of large scale built development beyond that town, and the small village of Clonygowan in the far north of the central study area.

For these reasons the sensitivity of the central study area is generally considered to be **Medium-low**.

#### *Wider Study Area (c. 5-20km)*

The wider study area, however, is less homogenous than the central study area, in terms of landscape character. While it is predominantly an ostensibly flat or slightly undulating productive rural area contained in pastoral farmland and interspersed by peat bogs with peripheral forest plantations, this is diversified by the presence of the Slieve Blooms in the south-west quadrant of the study area, as well as occasional low hills or promontories rising from the plains in the southeast quadrant (e.g. the Rock of Dunamaise).

The Grand Canal dissects the northern portion of the central study area. More than 13km from the site of the proposed development, it is classified as an area of ‘high sensitivity’ within the Offaly CDP. However, the character and values associated with the canal corridor are strongly confined to the canal and its associated towpaths, which are generally bordered by canal side vegetation. Although tranquil and with some degree of natural character, they are not particularly sensitive landscape features beyond their immediate setting.

Thus, the Grand Canal is a noteworthy landscape feature in the north of the study area, but not one that is influential in terms of landscape character. Of the other designated areas of 'High Sensitivity' Co. Offaly landscapes within the study area, most take the form of either tight linear corridors (in line with a canal or esker) or else tight, isolated pockets or shards that are not representative of the wider landscape.

There is not a notably high concentration of built heritage features or demesne landscapes within the wider study area and where these do occur, they do not strongly contribute to the prevailing landscape character. One exception is in the vicinity of the small village of Emo, where the character of the landscape is influenced by Emo Court Demesne. More apparent, however, is the regularity of small to large towns spread across the three counties that occupy the study area. While such a low-scale urban fabric is present within the study area, the size of these towns, in comparison to the spacing between them and even smaller settlements, do little to inform the prevailing landscape character of the study area. That character is strongly influenced by human intervention and modification, particularly in relation to energy production. The distinctive linear commercial harvesting patterns within most of the larger peat bogs are also physical testimony to a legacy of energy production in this wider area.

In summary, it is considered that aside from some isolated landscape features, which are considered to be in the higher ranges of sensitivity, the vast majority of the outer study area has a landscape sensitivity that is no greater than that of the central study area – **Medium low**.

### 11.7.2 Magnitude of Landscape Impacts

The physical landscape, as well as the character of the site and its immediate surrounds, will be affected by the proposed turbines and related ancillary development (e.g. the substation, access and circulation roads and areas of hard standing for the turbines). By contrast, for the wider landscape of the study area, landscape impacts relate exclusively to the influence of the proposed turbines on landscape character.

There will be physical impacts on the land cover of the site as a result of over 5km of newly formed access tracks and areas of hard standing around each turbine, as well as from clearance required for the substation. Less than 1km of the proposed access track network currently exists as farm, forest and bog tracks that will need only minor upgrade works to facilitate construction and maintenance of the turbines. Furthermore, on flat sites such as these, there is little requirement for modification of the terrain through cut and fill slopes in order to construct access roads and flat areas of hard standing. Thus, there will be a relatively minor loss of arable land to construction works for the turbines in the context of the greater site. This is on the basis that none of the proposed features has a significant 'footprint' and most of the turbines are contained in peatland fringes, coniferous forestry plantations and marginal grazing land. Any temporary excavations or stockpiles of material will be re-graded to marry into existing site levels and reseeded appropriately.

Approx. 18ha of commercial conifer forest will be harvested early in order to accommodate the construction and operation of the proposed turbines, including their access tracks. Although this represents a modification to the planned felling regime, it is only the timing of such operations that is altered, and this has very little effect on landscape character. There will also be 252m of hedgerow and 498m of removed to facilitate this development, mainly for sections of the proposed access tracks and hard standings. While no new bridges are proposed to be constructed to facilitate the proposed development, just one culvert needs to be widened. However, a new entrance way from the local road adjoining the western boundary of the site is proposed. This splayed entranceway and requirement for sight lines will also require the removal of a number of trees, to facilitate it, as well as necessary sightlines. Nonetheless, prevailing land use activities will also be able to continue almost unabated around the turbines.

The principal landscape impact will be the change in character of the immediate area due to the introduction of large-scale structures with moving components. These will be a prominent and defining landscape feature within the local landscape, as would be the case for a commercial scale wind farm placed into almost any landscape context. Nonetheless, this is a broad landscape context of large cutaway bogs, conifer plantations, marginal peatland fringes and pastoral agriculture where field sizes tend to be mid to large sized. Accordingly, the proposed wind farm will be reasonably assimilated, in terms of scale within the flat terrain and broad land cover patterns of the central study area. There will be a slightly stronger contrast of scales between the proposed turbines and the rural dwellings and associated farm structures in the near vicinity of the site, but these are relatively few and they are setback from turbines by more than 750m for non-involved landowners. The scale and extent of the proposed turbine structures will add an intensity of built development to a landscape in the central study area that is currently characterised, with the exception of Mountmellick, by low levels of such development.

Similarly, the movement of the turbine blades will introduce a slightly higher degree of movement to a landscape that is currently relatively static. The degree of perceived development intensity will also increase as a result of the proposed wind farm.

Whilst the scale and extent of the proposed wind farm might be considered modest for an open peatland area, the smaller scale and more sinuous layout reflects a compromise dictated by its location along the farmed and forested fringe of an elongated peatland area. The height of turbines is comparable with current trends of constructed and permitted wind farms in the midlands and generous setback distances from houses are provided, which reduces the potential for scale conflict.

There are no other existing wind energy developments within the central study area, so this proposal represents a relatively new form of development in the local area. However, located 13km northeast of the of the proposed development (i.e. within the wider study area) is the 28-turbine Mount Lucas Wind Farm, which is located in a re-wilding/re-generating cutaway bog. Outside the study area but within County Laois, an 8-turbine windfarm, Gortahile, has been operable since 2010. Across the Midlands, several other wind farms located in cutaway bogs have also been granted planning permission in recent years (e.g. Yellow River, Clonreen, and Coole). Consequently, there is a public perception that wind energy is an emerging form of development in the lowland and bog landscape of the Midlands. Thus, wind farms could not be described as an unfamiliar or uncharacteristic form of development in the region. It is also considered that there is a strong thematic relationship and natural synergy between the generation of energy from peat extraction and the harnessing of wind energy on the same and adjacent sites. Despite the modal shift, these areas can continue a considerable legacy of 'energy landscapes' in the public perception.

In relation to demesne landscapes and notable heritage features, such as that of Emo Court Demesne or the Rock of Dunamais, there is potential for turbines to conflict with the sense of 'past times' or nostalgic landscape character. In the case of the stately houses and demesnes, this sense of landscape character is relatively insular in that it is substantially contained within the walls and mature field boundaries of these sites. These boundary features also tend to limit the degree of intervisibility between the heritage assets and the proposed turbines and, therefore, the degree to which the demesne landscape character is affected by the proposal. In the case of Emo Court Demesne, it is located over 8km from the nearest proposed turbine and is heavily enclosed in woodland along its eastern and north-eastern boundaries (i.e. in the direction of the site).

Whilst there is a considerably higher degree of intervisibility between the elevated Rock of Dunamais and the proposed Dernacart Windfarm, the castle ruins command over a fairly typical rural landscape of lowland pastoral farming and is located more than 14km from the nearest proposed turbine. Given this physical separation distance, as well as the perceptual separation to the surrounding lowland context, there is little sense that the proposed windfarm will impose on the historic character of the Rock, and its associated heritage features. There are also limited opportunities where the proposed turbines and the Rock may be viewed in combination within the same viewshed, which tends to reinforce the sense of separation between these potentially conflicting entities (see visual impact section for further discussion).

The fact that wind energy developments represent an additional land use rather than a change of land use is one of the more positive aspects of this form of renewable energy in rural areas. Within the rural landscape of the central study area, which has considerable landscape value associated with its productive capacity, the addition of another layer of productivity is not incongruous with the existing character. Furthermore, this particular landscape has a legacy of energy production through peat harvesting and, consequently, there is a thematic link to this successive form of renewable energy production. Whilst wind turbines are built structures and have a commercial function, in Ireland they are structures that are more synonymous with rural areas than urban or industrial areas. Though they are sometimes referred to as industrial, this is something of a misnomer, as it evokes connotations of traditional industrial developments with an intense cluster of bulky structures on the outskirts of significant settlements. By contrast, wind farms are a relatively dispersed arrangement of slender structures overlaid on, rather than disrupting, the existing land use pattern. This is even more so the case for a modest sized eight turbine wind farm.

Beyond distances of approximately 2-3km, even tall wind turbines begin to become part of the overall landscape matrix, rather than a defining feature of landscape character. Therefore, beyond the central study area, the proposed wind farm is less likely to influence landscape character to a significant degree, and this potential continues to decrease with distance.

Another factor to consider, in terms of effects on landscape character, is the perceptual transition between landscape types.

Even where a comparatively high degree of intervisibility might occur between the proposal site and elevated terrain, such as the Slieve Blooms or the Rock of Dunamais, there is a sense of separation in the landscape character units. In this example, the hills in the southwest and southeast of the study area are perceived as an island in a lowland 'sea' of bogs and pastoral farmland. The fact that the turbines will be clearly perceived to be anchored within the lowland context results in them having less of a sense of imposition on this upland landscape character, and this lack of imposition is further accentuated by the modest sized eight-turbine wind farm.

Site activity will be at its greatest during the construction phase due to the operation of machinery on site and movement of heavy vehicles to and from site. This phase will have a more significant impact on the character of the site, but it is a short-term impact that will cease upon completion of the scheme (12 months).

Given the small footprint of the development features, physical landscape effects will be long term, but not permanent, in respect of the definitions provided in the EPA Guidelines. Within a year or two of decommissioning there is likely to be little evidence that wind turbines existed, and the prevailing land use of the time will be allowed to envelop it.

In summary, there will be physical impacts on the land cover of the site as a result of this development, but these will be relatively minor in the context of the already modified context of cutaway peatland, conifer plantations and pastoral farmland. Effects on landscape character will be most noticeable within the central study area (<5km) due to the perceived scale, intensity and extent of the proposed development in this immediate context. The proposed wind farm will be a new and defining feature of the landscape character in the central study area, but it is not considered to be an incongruous feature within this robust and anthropogenic landscape setting. On balance, the magnitude of landscape effect in the central study area is deemed to be **Medium-low** in the nearest 2-3km. This is likely to reduce to a **Low** magnitude beyond this threshold.

Within the wider study area, beyond 5km, the effects on landscape character are considerably lower and will reduce further as separation distance increases. The proposed wind farm will be perceived as one form of development within a pattern of other broad scale anthropogenic land uses. Even if visible from landscape areas/features beyond 5km, the proposed wind farm will be perceived as a discrete background feature of another landscape area.

Consequently, the magnitude of landscape effect for the wider study area is judged to be no greater than **Low-negligible** out to approximately 10km and only when clear intervisibility exists. Beyond this distance threshold the magnitude of landscape impact is considered to reduce to **Negligible**.

### 11.7.3 Significance of landscape Effects

The significance of landscape impacts is a function of landscape sensitivity weighed against the magnitude of the landscape impact. This is derived from the significance matrix (Table 11.3) used in combination with professional judgement. Based on the written assessment contained above in Sections 11.7.1 and 11.7.2 the significance of landscape impacts is considered to be **Moderate-slight** within the immediate context of the site (nearest 2-3km). Thereafter, significance will reduce to **Slight** and **Imperceptible** at increasing distances, as the development becomes a progressively smaller component of the wider landscape fabric.

## 11.8 Residual Visual Effects

Table 11.11 (below) summarises the full textual assessment of visual effects for each View Point (VP) contained in Appendix 11.1. Whilst the 'receptor sensitivity analysis table' and full textual assessment for each VP is normally contained within the landscape and visual chapter, in this instance, given the considerable number of VP's, it is considered more prudent to place this material in a separate appendix and focus herein on the significance of the findings. The left hand side of the table incorporates statistical data associated with the view of turbines, whilst the right hand side contains professional judgements in respect of the view. It is important to note that the professional judgements are based on the effects experienced in relation to the view and are not directly influenced by the statistical data. These aspects are only combined within Table 11.11 in order to identify patterns of effect to better inform the conclusions of this assessment.

**Table 11-11: Summary of Visual Effects at Viewshed Reference Points (VRP's)**

VRP No.	Distance to nearest turbine (km)	No. of turbine nacelles visible	Visual receptor Sensitivity (from Appendix 11-1(a))	Visual Impact Magnitude	Significance of Visual effect
<b>VP1</b>	10.2km	0	Low	Negligible	<b>Imperceptible</b>
<b>VP2</b>	14.9km	8	High	Low-negligible	<b>Slight</b>
<b>VP3</b>	12.3km	0	Low	Negligible	<b>Imperceptible</b>
<b>VP4</b>	9.8km	0	High-medium	Negligible	<b>Imperceptible</b>
<b>VP5</b>	8.4km	1	Medium-low	Low	<b>Slight-imperceptible</b>
<b>VP6</b>	3.1km	0	Medium-low	Low	<b>Slight</b>
<b>VP7</b>	2.3km	3	Medium-low	Medium-low	<b>Moderate-slight</b>
<b>VP8</b>	1.1km	5	Medium-low	Medium	<b>Moderate</b>
<b>VP9</b>	1.1km	3	Medium-low	Medium	<b>Moderate</b>
<b>VP10a</b>	4.5km	0	Medium	Negligible	<b>Imperceptible</b>
<b>VP10b</b>	4.0km	6	Medium	Medium	<b>Moderate</b>
<b>VP11</b>	4.8km	5	Medium	Medium-low	<b>Moderate-slight</b>
<b>VP12</b>	4.8km	0	Low	Negligible	<b>Imperceptible</b>
<b>VP13</b>	15.3km	0	Medium	Negligible	<b>Imperceptible</b>
<b>VP14</b>	13.7km	0	Medium	Low-negligible	<b>Slight-imperceptible</b>
<b>VP15</b>	14.2km	0	Low	Negligible	<b>Imperceptible</b>
<b>VP16</b>	14.6km	0	Medium-low	Negligible	<b>Imperceptible</b>
<b>VP17</b>	17.5km	0	Medium-low	Negligible	<b>Imperceptible</b>
<b>VP18</b>	10.6km	0	Medium-low	Negligible	<b>Imperceptible</b>
<b>VP19</b>	9.7km	8	High	Low	<b>Moderate-slight</b>
<b>VP20</b>	17.4km	0	Low	Negligible	<b>Imperceptible</b>

### 11.8.1 Impacts on Designated Views

As covered in Section 11.3.4.3 and Section 11.3.4.4, there are many designated views and, less so, scenic routes within the study area. The viewpoint set that has been assessed, herein, represents each of these types of designated view, but only where considered relevant. Designated scenic views that are oriented in a different direction to that of the proposed development have been omitted from the assessment set, following an initial consideration. This is in the interests of focussing on potential significant impacts rather than highlighting the absence of effects at designated receptors. With this in mind, it should be noted that there are no *relevant* scenic designations within the central study area (<5km). In that context, this report has identified that only five such designated views/routes (i.e. two each in Counties Laois and Offaly, and one in County Kildare) that have the potential for views in the direction of the site.

Designated scenic views tend to be attributed for two principal reasons within this study area. They are either elevated panoramic vistas over the plains from elevated uplands and isolated hilltops or, alternatively, they are river/canal views from hump-backed bridges. In this flat landscape, even a small degree of elevation (e.g. 2m) achieved by crossing a river/canal bridge can open up a wider vista, and there will always be channelled views along the river corridor that extend further than prevailing views within the lowland context. This is due to the high degree of vegetative screening within the lowland context of field hedgerows, conifer plantations and scrubby bog fringes. In addition, the only designated scenic route in the study area relates to views of the "Slieve Bloom Mountains and around the foothills of the mountains themselves."

For the two relevant designated views/prospects in County Offaly and the one in County Kildare, the significance of visual impact was deemed to be 'Imperceptible' in all three cases. As for the County Laois designated views, that from the Rock of Dunamaise (i.e. VP2) was deemed to have a 'Slight' significance of visual impact, while that from the Slieve Bloom Mountains (i.e. VP19) was deemed to have a 'Moderate-slight' significance of visual impact.

Across the five designated views/scenic routes, such significance is, on average, relatively low and will ensure that the proposed windfarm will have very little, if any, material effect on visual amenity from all designated views/routes within the study area.

### 11.8.2 Impacts on local community views

Local Community views are considered to be those experienced by those people who live, work and move around the area within approximately 5km of the site. These are generally the people that are most likely to have their visual amenity affected by a wind energy proposal due to proximity to the turbines, a greater potential to be surrounded by turbines or having turbines as a familiar feature of their daily views. These local community VP locations are all selected on the basis of the most open views available in order to represent a worst-case scenario. It is important to note that open views are not necessarily typical views of the scheme from within the local landscape.

In this instance, the viewpoint selection set well represents views from local roads and residences, as well as the small and sometimes dispersed rural settlements that occur within the near vicinity of the proposed Dernacart Wind Farm. These selected viewpoints are not a reflection of a high population density in this rural area, or the relative proximity of the population to the proposed turbines, as both are fairly typical scenarios in the Irish context. Instead, it reflects a desire to focus the assessment on those receptors with the most potential to be impacted by the proposed development. Consequently, one third (i.e. 7) of the 21 VPs were specifically selected as Local Community views. Of these, the highest level of visual impact significance is considered to be 'Moderate,' and this occurs at three of the VP locations (VP8, VP9 and VP10b). VP8 and VP9 are located within 1.2km of the nearest turbine and share a general absence of foreground screening (e.g. mature roadside trees), resulting in open and relatively close views of the proposed turbines.

However, VP10b is a very different case. To begin with, the visual sensitivity of this receptor is deemed to be 'Medium,' rather than 'Medium-low,' on account of there being a Laois County Council designated view from this road at this townland. However, that view is orientated towards the Slieve Blooms in the southwest, rather than the direction of the site of the proposed wind farm, to the southeast. Encompassing the same receptor, 4-4.5km northwest of the nearest proposed turbine, VP10a and VP10b portray the vast range of likely visibility along this section of the N80. At VP10a, no aspect or element of the proposed wind farm will be seen from this location, owing to intervening vegetation. Within 400m southeast of there, however, at VP10b, most of the turbines will be visible. With this in mind, the 'worst case scenario' was taken for the resulting summary of visual effects (i.e. a 'Moderate' visual impact significance).

The nature of turbine visibility is also very similar for each of the three 'Moderately' impacted local community views due to the comparative viewing distances to nearest turbines, which tend to reveal only blades sets or partial blades sets above intervening vegetation. The main variance is the lateral extent of the development, resulting in a balance at play between the clustered turbines within a tighter lateral extent and the more relaxed and permeable view of turbines spread across a wider array.

In any event, the 'Moderate' significance of impact at these local receptor locations principally relates to the introduction of new tall structures into the environs of peatland, fringe farmland and forestry, where there is currently low levels of built development within view. It is not related to any sense of overbearing or scale conflict from the wind turbines, which are comfortably assimilated into this broad scale landform and land cover pattern. Nor is it related to any sense that the proposed turbines appear out of place in this productive and ever-evolving rural setting, where landscape values and rural visual amenity relates more to sustaining the local rural economy than scenic or naturalistic value.

Of the remaining four local community views assessed, three viewpoints (i.e. VP6, VP7 and VP11) were deemed to have a significance of visual impact no higher than 'Moderate-slight.' Although VP6 is located little more than 3km from the nearest turbine, intervening vegetation - either along the roadside or near it - will serve to largely obscure views of the proposed development. VP11, meanwhile, is almost an opposite set of circumstances.

Located almost 5km from the proposed turbines, a lack of roadside vegetation, in tandem with a marginally elevated roadside location, resulted in the 'Moderate-slight' visual impact significance. VP7, however, is located within the northern outskirts of Mountmellick town, less than 2.5km from the nearest turbine.

### 11.8.3 Impacts on Centres of Population

Seven viewpoints were selected to represent 'Centres of Population', primarily due to the number of viewers that are likely to experience that view. The relevance of the settlement is based on the significance of its size, in terms of the study area or its proximity to the site. Of the seven viewpoints, the highest level of impact is deemed to be 'Moderate-slight' at VP7, located within the northern outskirts of Mountmellick town, less than 2.5km from the nearest proposed turbine. In this instance, three proposed wind turbines will be visible, with a fourth partially discernible, along the blade tip of a fifth turbine, but will not be spatially dominant within that complex and highly-modified vista.

The second highest level of impact was from VP5 on the outskirts of Portarlinton ('Moderate Slight'), which will reveal a partial blade set of one proposed turbine and the blade tip of another proposed turbine will be seen rising above a treeline to the west. However, being located on an elevated bridge over the Dublin-Cork rail line was largely responsible for attaining such a view of the proposed development.

Of the remaining five viewpoints that were selected to represent 'Centres of Population', these covered the towns of Portlaoise, Tullamore and Mountrath, as well as the villages of Clonygowan and Clonasee. In all five cases, the resulting visual impact significance was deemed to be 'Imperceptible.'

### 11.8.4 Impacts on major routes

Of the major routes that pass through the study area, the most affected by this proposal is likely to be the N80, to the west and northwest of the site and within the central study area. This is represented by viewpoint VP9 and VP10b. Owing to a combination of relative proximity (i.e. within approximately 5km of the site) and a lack of effective roadside screening (e.g. tall vegetation) at these select locations, the resulting significance of visual impact was deemed to be 'Moderate.' A point of consideration for VP9 and VP10b is that motorists travelling up to 100km per hour on a busy national road are not particularly susceptible visual receptors to changes in views. However, outside the central study area, such as approx. 10km south of the site at the northern outskirts of Portlaoise (i.e. VP1), this significance drops dramatically to 'Imperceptible.'

Behind that of VP9 and VP10b, the next highest significance of visual impact was deemed to be at the lower end of the spectrum: 'Slight-imperceptible,' which was in relation to the Cork-Dublin rail line, as experienced at VP5. However, being located on an elevated bridge over this rail line was largely responsible for attaining such a view of the proposed development, whereas the railway network tends to hug the ground plain with roads passing over it, rather than the other way around. That rail line also has a reasonable degree of trackside screening for most sections, and for these reasons it is generally considered to be unaffected by the proposal.

Notably, the largest transport route in the study area, the M7, which was represented in VP3, was deemed to have an 'Imperceptible' degree of significance of visual impact. This was captured from an elevated overpass at Junction 15 of the motorway. For the several kilometres in which the M7 is within the Zone of Theoretical Visibility, embankments and/or semi-mature trees almost exclusively enclose the motorway. This serves to channel views along this arterial corridor, curtailing longer-distance views to either side (e.g. in the direction of the site).

The other major route in the study area that is within the Zone of Theoretical Visibility is the N52, in the northwest of the study area, as represented by VP15 and VP17. However, it was deemed to have an 'Imperceptible' degree of significance of visual impact.

### 11.8.5 Impacts on Heritage and Amenity features

Firstly, of the four viewpoints that were selected to represent 'Heritage and Amenity features', none are located within the central study area, and all are located more than 9.0km from the site of the proposed wind farm.

Secondly, it is important to note that 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. Thus, because such locations tend to have a higher-than-average visual sensitivity, the resulting significance of visual impact can also be higher-than-average, even when visibility of the proposed development (i.e. the magnitude of visual impact) is at the lower end of the spectrum. Thirdly, while there are 'Heritage and Amenity features' within the study area, many of these are out of the Zone of Theoretical Visibility (e.g. Stradbally Hall).

Of the four viewpoints that were selected to represent 'Heritage and Amenity features', that which had the highest significance of visual impact was VP19, from the Slieve Blooms, and is a good case in point. Although, the magnitude of visual impact was deemed to be 'Low,' the receptor sensitivity was deemed to be 'High,' thereby resulting in a 'Moderate-slight' significance of visual impact: even though the nearest proposed turbine was almost 10km distance from that location. Similarly, with the Rock of Dunamais, which is represented by VP2, and is a comparably elevated view out onto the plains below. This location is almost 15km from the nearest proposed turbine, and the resulting magnitude of visual impact was deemed to be 'Low-Negligible.' However, its 'High' receptor sensitivity resulted in a 'Slight' significance of visual impact. In both instances, the turbines are a distinctive feature within the plains, but have a modest visual envelope in the context of the vast views on offer and it is not considered that turbines in the distant background context unduly impact the visual amenity of viewers at these hilltop amenity / heritage sites.

Moving down the scale of significance, the third of these four heritage/amenity viewpoints is located along the Grand Canal Way: represented by VP14, and over 13km from the proposed windfarm. From this location, the partial blade sets of three turbines will be seen over the distant treeline, as well as the blade tip of a fourth turbine. Thus, it was deemed to have a 'Slight-imperceptible' significance of visual impact. The fourth and final heritage/amenity viewpoint, was from Emo Court Demesne, where a thick woodland of mature trees within the Demesne preclude any further views in the direction of the site, resulting in an 'Imperceptible' significance of visual impact.

#### 11.8.6 Summary of visual impacts

Whilst local residents are acknowledged to be among the most susceptible viewer groups, this is balanced by the slightly lower value of the views that are afforded from within the lowland landscape of the central study area. These views tend to be limited in extent and are of a typical rural nature, which is reinforced by the fact that there are no scenic designations within the central study area, aside from one approx. 4km northwest of the site and not orientated in its direction. Indeed, the value of designated views within the study area tends to relate more to the extent of the view on offer rather than remote or naturalistic character, which is often associated with designated scenic views in other parts of the country. In this instance, the landscape in view is generally a highly modified, anthropogenic rural one, within which the view of new development will not necessarily conflict with scenic values.

It must be noted that the values associated with a view are not a direct reflection of the quality of the landscape in view, but whether such views would be held up as rare or remarkable by the general population. In this instance, it is a fairly typical productive landscape of peatland fringe farmland and forestry that typifies local views. The 'Medium-low' sensitivity that has been commonly attributed to the representative viewpoints herein, reflects that the visual setting of the central study area can accommodate some degree of visual change without critically affecting its salient qualities/values.

The visual impacts of the proposed development were assessed across 21 different representative viewpoints from a wide range of angles, elevations and distances within the study area. Of the 21 viewpoints assessed, the proposed development will have an 'Imperceptible' impact upon visual amenity in the majority of instances (i.e. 11 viewpoints: VP1, VP3, VP4, VP10a, VP12, VP13, VP15, VP16, VP17, VP18 and VP20). As the proposed development includes eight turbines with a tip height of 185m, there is a distinctively high number of receptors that will not experience any material impact to their visual amenity as a result of the proposed development. Indeed, in the vast majority of these 11 viewpoints, no aspect or element of the proposed development will be seen from these locations, which are generally within the wider landscape of the study area.

The highest significance of visual impact experienced in this scheme was no higher than 'Moderate,' which occurred at three viewpoints in the central study area. Two of those (i.e. VP8 and VP9), occurred within 1.2km of the site, and are located at points where there is a dearth of tall roadside vegetation.

For the third remaining viewpoint (i.e. VP10b) with a 'Moderate' significance of visual impact, the 'worst case scenario' was again applied, whereas within a short distance along that same road, for the same receptor, there were no views of the proposed development.

The second highest significance of visual impact experienced in this scheme was 'Moderate-slight,' which occurred at three viewpoints (i.e. VP7, VP11 and VP19), which ranged in distances to the nearest proposed turbine from 2.3km to 9.7km. While these viewpoints were all within 10km of the proposed development, and one was recorded at the nearest town (i.e. VP7 from Mountmellick), aside from receptor sensitivity (in the case of VP19), one of the most significant differences between these viewpoints and those deemed to have a 'Moderate' visual impact significance was the presence of mature, intervening vegetation (i.e. not the nature, scale and siting of the proposed development). Just one viewpoint (i.e. VP2) was deemed to have a 'Slight' significance of visual impact, while the remaining two viewpoints (i.e. VP5 and VP14) were deemed to have a 'Slight-imperceptible' visual impact.

In the process of assessing the visual impacts of this proposal it has become clear that there are two main ways in which it tends to be viewed from within the study area. Either it is visible in a relatively clear and cohesive manner from a very limited number of vantage points, or it is partially visible with only the nearest proposed turbines rising above and between sections of foreground vegetation, and in a more ambiguous manner. On balance of the inverse nature of the 'screening' versus 'legibility' relationship, it is not considered that the proposed Dernacart Wind Farm will give rise to any significant visual impacts.

### 11.9 Cumulative Impacts

The Scottish Natural Heritage (SNH) Guidance relating to 'Assessing the Cumulative Effects of Onshore Wind Farms (2012) identify that cumulative impacts on visual amenity consist of combined visibility and sequential effects. The same categories have also been subsequently adopted in the Landscape Institute's 2013 revision of the Landscape and Visual Impact Assessment Guidelines. The principal focus of wind energy cumulative impact assessment guidance relates to other wind farms - as opposed to other forms of development. This will also be the main focus herein, albeit with a subsequent consideration of cumulative impacts with other forms of notable development (existing or permitted), particularly within the central study area. According to the Scottish Natural Heritage (SNH) Guidance:

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

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

Cumulative impacts of wind farms tend to be adverse, rather than positive, as they relate to the addition of moving manmade structures into a landscape and viewing context that already contains such development. Based on guidance contained within the SNH Guidelines relating to the Cumulative Effects of Wind Farms (2005) and the DoEHLG Wind Energy Guidelines (2006), cumulative impacts can be experienced in a variety of ways. In terms of landscape character, additional wind energy developments might contribute to an increasing sense of proliferation. A new wind farm might also contribute to a sense of being surrounded by turbines with little relief from the view of them.

In terms of visual amenity, there are a range of ways in which an additional wind farm might generate visual conflict and disharmony, in relation to other wind energy developments. Some of the most common ways 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 11.12 below provides Macro Works' criteria for assessing the magnitude of cumulative impacts, which are based on the SNH Guidelines (2012).

**Table 11-12: Magnitude of Cumulative Impacts**

Magnitude of Impact	Description
<b>Very High</b>	<ul style="list-style-type: none"> <li>The proposed wind farm will strongly contribute to wind energy development being the defining element of the surrounding landscape.</li> <li>It will strongly contribute to a sense of wind farm proliferation and being surrounded by wind energy development.</li> <li>Strongly adverse visual effects will be generated by the proposed turbines in relation to other turbines or sizeable developments.</li> </ul>
<b>High</b>	<ul style="list-style-type: none"> <li>The proposed wind farm will contribute significantly to wind energy development being a defining element of the surrounding landscape.</li> <li>It will significantly contribute to a sense of wind farm proliferation and being surrounded by wind energy development.</li> <li>Significant adverse visual effects will be generated by the proposed turbines in relation to other turbines or sizeable developments.</li> </ul>
<b>Medium</b>	<ul style="list-style-type: none"> <li>The proposed wind farm will contribute to wind energy development being a characteristic element of the surrounding landscape.</li> <li>It will contribute to a sense of wind farm accumulation and dissemination within the surrounding landscape.</li> <li>Adverse visual effects might be generated by the proposed turbines in relation to other turbines or sizeable developments.</li> </ul>
<b>Low</b>	<ul style="list-style-type: none"> <li>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.</li> <li>It might contribute to wind farm development becoming a familiar feature within the surrounding landscape.</li> <li>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.</li> </ul>
<b>Negligible</b>	<ul style="list-style-type: none"> <li>The proposed wind farm will most often be viewed in isolation or occasionally in conjunction with other distant wind energy developments.</li> <li>Wind energy development will remain an uncommon landscape feature in the surrounding landscape.</li> <li>No adverse visual effects will be generated by the proposed turbines in relation to other turbines or sizeable developments.</li> </ul>

### 11.9.1 Cumulative Baseline

There are two permitted and one existing wind farm within the study area. These are outlined in Table 11.13 below:

**Table 11-13: Other Wind Farms within the Study Area**

Wind Farm name	Turbine No.	Distance and direction from proposal site	Status
Moanvane	12	7km NE	Permitted
Mount Lucas	28	13.2km NNE	Existing
Cloncreen	22	18.5km NE	Permitted

It should be noted that all three of these other wind farms are located within the north-eastern quadrant of the study area. In addition, approx. half of the Moanvane turbines are located marginally outside the study area.

### 11.9.2 Department of Environment, Heritage and Local Government (DoEHLG) 'Wind Energy Development Guidelines' (2006)

As stated earlier with respect to the landscape baseline (11.7) the proposal is sited in an area that is most consistent with the 'Flat Peatland' landscape type identified within the Guidelines, but also with some characteristics of the 'Hilly and Flat Farmland' Landscape Type. The relevant cumulative guidance for each landscape type is set out below:

#### **Flat Peatland:**

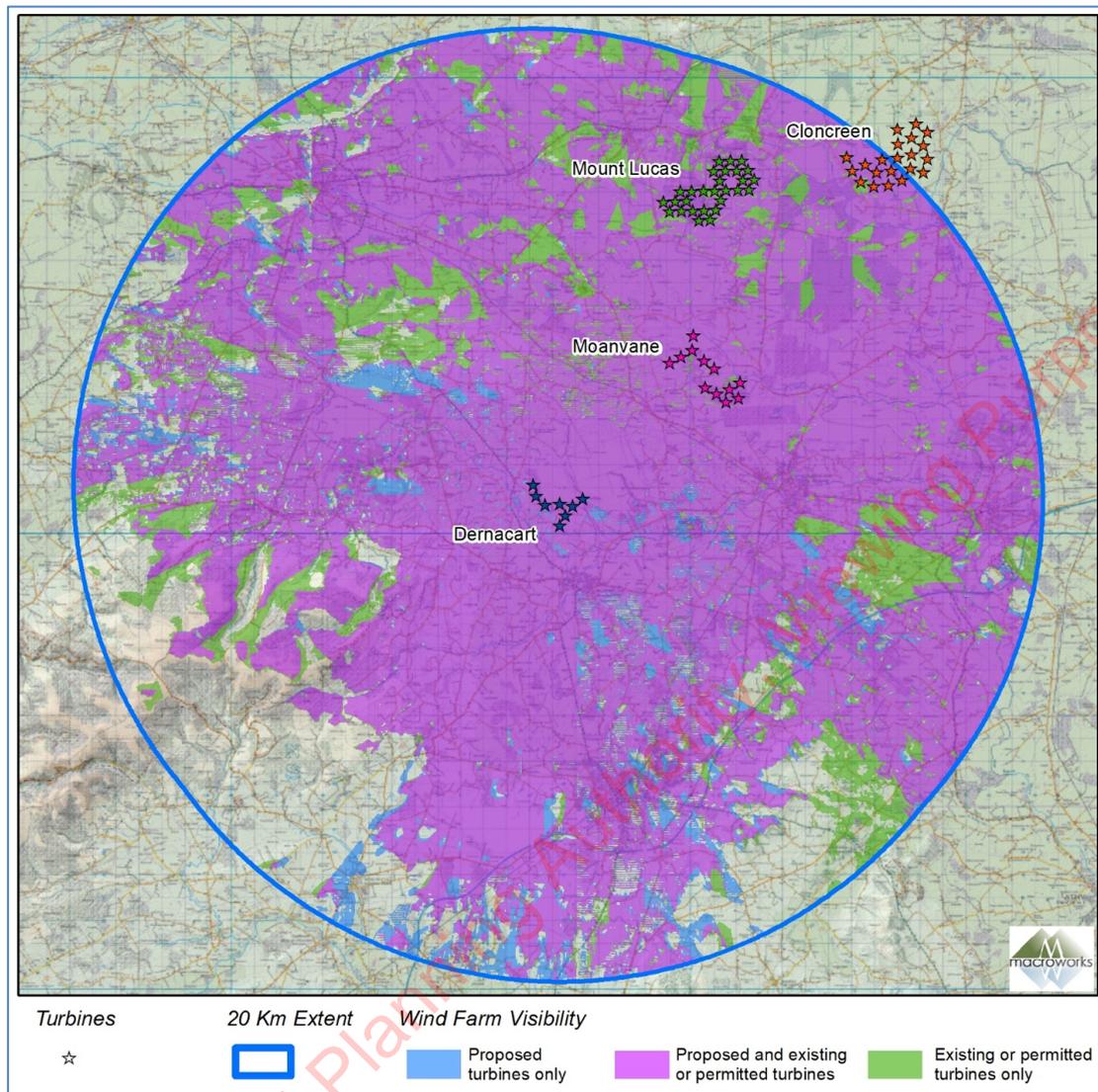
*"The openness of vista across these landscapes will result in a clear visibility of other wind energy developments in the area. Given that the wind energy developments are likely to be extensive and high, it is important that they are not perceived to crowd and dominate the flat landscape. More than one wind energy development might be acceptable in the distant background provided it was only faintly visible under normal atmospheric conditions"*

#### **Hilly and Flat Farmland:**

*"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."*

It is considered that the above guidance gives a good balance of the characteristics of the study area in terms of open visibility and potential for cumulative impacts to occur. The central study area has the flat terrain, broad landscape pattern of the flat peatland landscape type, but with a much higher degree of containment by vegetation structures than is anticipated by the guidelines. In this respect, it is more similar to the hilly and flat farmland landscape type. The other aspect to bear in mind is that the vast majority of receptors including settlements, rural dwellings and the road network are contained within the productive farmland zone rather than in open bog areas. Thus, open visibility for vast distances is rarely afforded. For these reasons, the proposed wind farm is considered to be consistent with the guidelines for both the 'flat peatland' and 'hilly and flat farmland' landscape types from the guidelines in regard to cumulative impacts.

11.9.3 Cumulative Zone of Theoretical Visibility



**Figure 11-19: Cumulative Zone of Theoretical Visibility**

The cumulative ZTV map (See Volume 4 of the EIAR for a larger scale graphic) indicates that:

- 68.8% of the study area will experience theoretical visibility of the proposed Dernacart turbines, as well as existing/and or permitted turbines in the study area;
- 10.7% of the study area will experience theoretical visibility of existing/and or permitted turbines only;
- 4.6% of the study area will experience theoretical visibility of the proposed Dernacart turbines only;
- 15.9% of the study area will not experience any view of the proposed Dernacart turbines or that of any existing wind farms.

The vast majority of the study area (i.e. almost 70%) will have theoretical views of some of the existing permitted or proposed turbines, in combination with the proposed Dernacart turbines. This tends to be most concentrated in the central and north-eastern quadrant of the study area, but it also includes the towns of Mountmellick, Portlaoise and Portarlington. The main areas without any theoretical view of turbines are within the south-eastern and south-west periphery of the study area, beyond raised terrain (e.g. the Slieve Blooms in the southwest).

There are relatively clear patterns within the study area, due to the flat and gently undulating nature of the terrain, as well as the clustering of cumulative developments within its north-eastern quadrant. Exclusive visibility of the proposed turbines generally occurs within small patches in the north-western and south-eastern quadrants of the study area and sporadically through the eastern half of the study area, as well as in the far southern periphery of the study area. However, this equates to less than 5% of the overall study area.

The most important consideration with regard to the 'bare-ground' cumulative ZTV map (as with the standard ZTV map) is that it is a computer generated theoretical output that bears little correspondence to actual visibility within the study area due to the effects of vegetative screening in this flat terrain. As indicated by the results of the Route Screening Analysis (RSA), intervisibility of turbines that are separated by more than 1-2km is only likely to occur from open and elevated ground or from tall structures.

The following table identifies the characteristics of the cumulative view of wind farms from each of the VRP's used earlier in the assessment of the visual impacts of the proposed scheme in its own right.

**Table 11-14: Nature of Cumulative Impacts**

VRP Ref.	No. of other wind farms in view	Nearer or further than proposal	Combined view (within a single viewing arc)	Succession view (within a series of viewing arcs from the same location)	Sequential view (view of different developments moving along a linear receptor)
VP1	0	-	-	-	-
VP2	3	All further	Yes	No	No
VP3	0	-	-	-	-
VP4	0	-	-	-	-
VP5	3	1 nearer & 2 further	Yes	No	Yes
VP6	0	-	-	-	-
VP7	1	Further	Yes	No	No
VP8	1	Further	Yes	No	No
VP9	1	Further	Yes	No	Yes
VP10 a & b	0	-	-	-	Yes
VP11	0	-	-	-	-
VP12	0	-	-	-	-
VP13	0	-	-	-	-
VP14	0	-	-	-	-
VP15	2	Nearer	Yes	No	Yes
VP16	0	-	-	-	-
VP17	1	Further	Yes	No	Yes
VP18	0	-	-	-	-
VP19	3	All further	Yes	No	No
VP20	0	-	-	-	-

#### 11.9.4 Cumulative Impact Assessment

Using the cumulative baseline information outlined above, a summary assessment of cumulative impact is provided below.

Table 11.15 above emphasises the nature of cumulative visibility within the study area. Firstly, of the 20 viewpoints, less than half (i.e. 8) has any cumulative visibility of other existing or permitted windfarms in the study area, and these are mostly elevated and/or expansive views towards the proposed turbines. In all eight viewpoints, the nature of that cumulative visibility is within a combined viewing arc. The nature of this cumulative visibility is distinct, mostly owing to all other existing or permitted windfarms in the study area being located in the north-eastern quadrant. This means that unless the viewpoint is located within this quadrant, the likelihood is that any cumulative visibility will entail a combined viewing arc.

Notably, only five viewpoints experience succession views (i.e. view of different developments moving along a linear receptor): a particularly low amount, considering the extent of potential linear receptors across a study area of 20km radius.

There are few opportunities for cumulative visibility within the landscape that lies between the proposed Dernacart Wind Farm and other existing or permitted windfarms in the study area (i.e. the northeast quadrant), as this is often flat lowland exploited bog, with limited residences or dwellings among or between such bogs. This is borne out by the fact that where viewpoints experience cumulative visibility, in the vast majority of cases that other permitted/existing wind farm in the study area is further from that viewpoint than the proposed Dernacart Wind Farm.

While there is cumulative visibility from the key amenity/heritage locations of the Slieve Blooms (i.e. VP20) and the Rock of Dunamais (i.e. VP2), this is almost inevitable owing to the elevated nature of those locations. In addition, those other wind energy developments visible are located more than 15km from these renowned and valued locations. While VP5 experiences cumulative visibility, it is only because it is from an elevated bridge overpassing a rail line; an elevation that is not representative of neighbouring Portarlino.

Wind energy development is becoming a more familiar feature of the midlands (following the construction of the Mount Lucas and Meenwaun Wind Farms in County Offaly). In conjunction with the other existing and permitted wind farms, the proposal will contribute to a sense that wind energy development is becoming a characteristic feature of the midlands landscape. However, this is not considered to be to the extent that wind energy development is the defining feature of this predominantly agricultural and peatland landscape, which will retain the current variety of productive land uses on the ground. Any minor sense of wind farm accumulation will be experienced from relatively few prominent viewing locations, rather than from within the lowland context where the vast majority of the midlands population live, work and move around.

The design of the proposed wind farm is considered to be in line with the siting, design and extent of the other existing and permitted wind energy developments within the study area. That is, it consists of a single cluster of turbines, with three-dimensional layout pattern in or adjacent to peatland areas. Thus, the proposal will continue an established design approach within this midlands context, which aids cohesion and assimilation and will reduce the potential for adverse cumulative impacts arising from conflicting design approaches.

In terms of cumulative aesthetic considerations, the proposed turbines will rarely be seen stacked together with other existing or permitted turbines in perspective, which could otherwise give rise to issues of scale confusion and visual clutter. This will remain the case even where the developments may be contained within direct alignment with each other. This is due to the considerable separation distances between them, which ensure that one wind energy development will always be seen as a very distant background feature in relation to the other. Although the turbines of the proposed wind farm and other existing and permitted schemes may, on occasion, be visible at similar scales from viewpoints that lie between them, where this occurs the developments will be seen in opposite directions or at widely disparate viewing angles.

Overall, it is considered that the proposed Dernacart Wind Farm will contribute an additional cumulative effect that is in the order of **Low**, in terms of the classifications defined in Table 11.13 above.

### 11.9.5 Cumulative impacts with other forms of development

As part of the EIA process, a planning search has been undertaken to identify other forms of existing and permitted development within both the immediate vicinity of the proposed Dernacart Wind Farm and the wider context (out to 20km).

Of most relevance to this landscape and visual impact assessment are those developments contained within the central study area (<5km), with which there may be some correlation in respect of landscape character or intervisibility that might generate in-combination effects on visual amenity. However, in this instance, there are no known existing or permitted developments of relevance within the central study area.

Indeed, the only known existing or permitted developments of relevance within the broader study area is one permitted development that is located upon the eastern fringe of the study area, in County Kildare, over 17km from the proposed Dernacart Wind Farm. This entails:

- The construction of an off-line motorway services station.

Owing to its vast distance from the proposed Dernacart Wind Farm, as well as the modest scale of this development, in both instances it is considered that the proposed Dernacart Wind Farm will contribute an additional cumulative effect that is in the order of **Negligible**, in terms of the classifications defined in Table 11.13 above.

### 11.9.6 Cumulative Impacts Conclusion

Overall, it is considered that the proposed wind farm represents a minor and suitably located addition to the wind energy development that is gradually becoming a more characteristic landscape feature throughout the lowland, midlands landscape, particularly within marginal peatland areas. There are few opportunities for intervisibility of the proposed wind farm in-combination with other wind energy developments from within the lowland plains fabric of Laois, Offaly and Kildare. Where such rare elevated vantage points allow for intervisibility, one of the developments is a distant background feature in the view of the other. Consequently, these are deemed to be **Low**.

In respect of cumulative impacts with other forms of development, owing to both distance and scale, these are deemed to be **Negligible**.

### 11.10 References

Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2018) and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2018)

Department of Environment Heritage and Local Government (DoEHLG) Wind Energy Planning Guidelines (2006)

Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).

Scottish Natural Heritage (SNH) Guidance Note: 'Assessing the cumulative impact of onshore wind energy developments' (2012)

Scottish Natural Heritage (SNH) Siting and Designing Wind Farms in the Landscape Version 3 (2017).

Laois County Council Planning Authority, Viewing Purposes Only