4

Landscape & Visual

4 Landscape & Visual Impact Assessment Technical Appendices

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Abbreviations used in the Landscape and Visual Impact Assessment

- AONB Area of Outstanding Natural Beauty
- EIA Environmental Impact Assessment
- ES Environmental Statement
- LCA Landscape Character Area
- LDP Draft Plan Strategy for the Local Development Plan (Sept. 2019) Mid and East Antrim Borough Council
- LVIA Landscape and Visual Impact Assessment; Chapter 4 of the Environmental Statement
- NIEA Northern Ireland Environment Agency
- NILCA Northern Ireland Landscape Character Assessment
- NIRLCA Northern Ireland Regional Landscape Character Assessment
- NIRSCA *'Northern Ireland Regional Seascape Character Assessment Research and Development Series No. 14/ 01'*, Northern Ireland Environment Agency (2014)
- PPS Planning Policy Statement; various PPSs published by the Department of the Environment are referred to in this Chapter
- PVP Provisional Viewpoint
- RES RES UK & Ireland Ltd; the Applicant
- RLCA Regional Landscape Character Area
- SCA Seascape Character Area
- SPPS *'Strategic Planning Policy Statement for Northern Ireland (SPPS): Planning for Sustainable Development'*, Department of the Environment (September 2015)
- SPG *'Supplementary Planning Guidance 'Wind Energy Development in Northern Ireland's Landscapes'*, Northern Ireland Environment Agency

(August 2010)

- VP — Viewpoint; Final Viewpoint shortlisted as part of viewpoint selection process described in methodology
- ZTV — Zone of Theoretical Visibility diagram

Best Practice Guidance publications used in the formulation of the LVIA Methodology

The Landscape Institute / Institute of Environmental Management and Assessment (2013) 'Guidelines for Landscape and Visual Impact Assessment, Third Edition'

4.1 The aim of these guidelines (GLVIA) is to encourage high standards for the scope and content of landscape and visual impact assessments, based on the opinion and practice of members of the Landscape Institute and the Institute of Environmental Management and Assessment.

4.2 The guidelines establish principles to assist in achieving consistency, credibility and effectiveness in LVIA, when carried out as part of an EIA. The following general principles of good practice are adhered to in the methodology for this LVIA:

- Clearly describe the methodology and the specific techniques that have been used;
- Use clearly defined and agreed terminology;
- Avoid generalisations about designated landscapes and their ability to accommodate change;
- Be as impartial as possible;
- Draw upon the advice and opinions of others and carry out consultations;
- Organise and structure the assessment to focus upon the key issues of relevance to decision-making;
- Openly acknowledge any deficiencies or limitations that may have constrained the assessment;
- Consider the most significant effects in all instances.

Scottish Natural Heritage[1] (August 2017) 'Siting and Designing Wind Farms in the Landscape. Version 3a'

4.3 This guidance provides principles for the design and location of wind farms with the aim of ensuring that wind farm developments appear appropriate within the landscape and reflects a development in the understanding of issues such as appropriate layouts for different locations, turbine size and design, wind farm extensions and cumulative development. The guidance acknowledges that

[1] Scottish Natural Heritage became Nature Scotland in August 2020

understanding of these issues is constantly evolving and this guidance will be regularly reviewed and updated to reflect this.

Nature Scotland (March 2021) 'Assessing the Cumulative Impact of Onshore Wind Energy Developments'

4.4 This guidance, first published by Scottish Natural Heritage in 2021, has been re-published by the new Nature Scotland agency (see footnote) in a more accessible form online. It sets out recommended principles for the assessment of cumulative landscape and visual impacts arising from wind farms. As per the guidance above, it is acknowledged that understanding of cumulative issues is constantly evolving and this guidance would be regularly reviewed and updated to reflect this. The only content changes between the 2012 and 2021 versions are the removal of guidance relating to ornithology and to some outdated contextual information.

Scottish National Heritage (February 2017) 'Visual Representation of Wind Farms, Version 2.2'

4.5 This guidance was originally published in 2006 to summarise and explain what was feasible, available and reasonable in terms of current good practice in the production of illustrations such as photomontages, wirelines and ZTV figures for use within an LVIA. It was revised in 2014 and 2017 to reflect developing experience and to ensure that visualisations are easier for the public and decision makers to use whilst also stressing that they are only a tool to aid decision making and must be considered alongside other information. SNH also recognise that different approaches may be appropriate for different types of developments, in different countries and for small scale projects. The prescriptive aspects of the guidance, and how they are interpreted in this LVIA, are included in Technical Appendix 4.2, paragraph 4.47.

4.6 Cognisance has been taken of the new guidance in this LVIA and its recommended methodology for taking photographs has been followed. However, the visualisations that accompany this LVIA are not printed at the large scale recommended by the guidance to allow for the practical and cost-effective distribution of public consultation material. SNH advises that printed visualisations should be produced at A1 size and viewed at a comfortable arm's length distance to facilitate easy comparison between viewpoints. In this LVIA the visualisations have been produced at A3 and, for clarity, the finished photomontages are presented on the same page as their corresponding wirelines for all shortlisted viewpoints.

Landscape Institute (September 2019) 'Technical Guidance Note 06/19: Visual Representation of Development Proposals'

4.7 This guidance aims to help landscape professionals, planning officers and other stakeholders to select types of visualisations which are appropriate to the circumstances in which they will be used. It provides guidance as to appropriate techniques to capture site photography and produce appropriate visualisations for all types of development but recognises that, for some types of development, including

wind energy, that more specific guidance may also be appropriate. In particular, this Technical Guidance Note is broadly consistent with and supportive of Scottish Natural Heritage guidance referred to in the preceding paragraphs.

Northern Ireland Environment Agency (August 2010) 'Wind Energy Development in Northern Ireland's Landscapes: Supplementary Planning Guidance to Accompany Planning Policy Statement 18 Renewable Energy'

4.8 The SPG provides broad strategic guidance on appropriate locations for wind energy development based on the definition of Landscape Character Areas (LCAs) within the NILCA. It is described in detail in Chapter 4, paragraph 4.69.

Scottish Natural Heritage (July 2018) 'Guidance Note: Coastal Character Assessment Version 1a'

4.9 This guidance note provides advice on how to undertake the assessment of coastal character and is used in this LVIA as a point of reference for general best practice in addition to the Northern Ireland specific information provided by the Northern Ireland Regional Seascape Character Assessment.

The Countryside Agency and Scottish Natural Heritage (2004) 'Landscape Character Assessment Guidance for England and Scotland. Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity'

4.10 The topic paper provides an overview of current thinking about landscape sensitivity and landscape capacity in terms of the concept involved and the practical techniques that are being used. Its aim is to set out some of the key principles, clarifying some of the issues, helping with definitions of key terms and providing examples of the approaches that are currently being used.

Technical Appendix 4.2: LVIA Methodology

4.11 This LVIA methodology has been specifically developed for wind farm development in Northern Ireland in accordance with the relevant best practice guidance where applicable (see Technical Appendix 4.1). The LVIA makes reference to mapped information, planning policy and existing landscape character assessment documents, and uses photographs and field survey work, together with the professional judgement of an experienced Landscape Architect. It combines existing desktop information, such as maps and documents, with detailed site surveys of the Study Area. The desktop study includes a review of relevant planning policies in order to identify any elements or parts of the Study Area which are recognised for their landscape or visual qualities and any preferred locations for wind farms that may already have been identified. It also evaluates likely levels of acceptable change for various parts of the Study Area in accordance with current definitions of landscape and visual sensitivity.

4.12 Potential landscape and visual effects are assessed as separate but linked issues. Both require a combination of quantitative and qualitative evaluation. The 'Magnitude' of landscape effects is derived from the extent to which physical changes cause changes in landscape character and value. The 'Magnitude' of visual effects relates to changes in the composition of views and people's perception of/responses to these physical changes.

4.13 For both landscape and visual effects the 'Significance' of effect is derived from the assessment of 'Landscape Value', the nature of the receptors in question (hereafter referred to as 'Sensitivity') and the nature of the effects on these receptors (hereafter referred to as the 'Magnitude' of change that will be experienced) and also by using professional judgement in relation to site circumstances. It is important to recognise that the landscape is constantly evolving and that opinions on the beneficial or adverse effects of wind farms are highly subjective. Therefore, whilst a judgement is made on the significance of effects, no judgement is made on whether these effects are beneficial or adverse.

Baseline Characterisation: Landscape Character

4.14 The meaning of landscape in this LVIA is in accordance with the SPPS definition as "*an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors*"[2]. The first stage of this LVIA establishes the existing landscape character of the Study Area. It includes a description of landform, land cover, seasonal elements and historical and cultural associations. Landscape character is the result of unique interactions between different elements such as geology, soils, vegetation and historical and current human influences. Natural, man-made, physical and aesthetic attributes are

[2] section 4.2.1 of SPPS

considered alongside the physical condition, frequency and rarity of these attributes. Areas of distinct, recognisable or common character are defined individually as LCAs. Existing definitions of LCAs and RLCAs are analysed by site survey.

4.15 Defining landscape character allows landscape value to be analysed. An understanding of landscape character and value requires an understanding of the processes that have created this character and future processes that may alter it. The overall value to society of each LCA is evaluated against defined criteria and their Sensitivity to development and change is established. The LVIA notes if/where existing definitions of landscape character have been amended. Some LCAs may not be considered in detail following the Baseline Assessment if they are not judged to be significantly affected by the Development. For example, LCAs on the periphery of the Study Area, or those from which there are few or no views of the Development. Such LCAs are clearly identified in the Baseline Assessment section of ES Chapter 4, Technical Appendix 4.3 and Figure 4.2.

Landscape Value

4.16 Values are attached to landscapes by different stakeholders for a variety of reasons. The LVIA process seeks to establish a definition of 'Landscape Value' that reflects both this range of opinions and each particular landscape's contribution to the overall landscape character of the Study Area. Defining the value of a particular landscape to society requires the recognition of 'sense of place' through consideration of factors such as condition, scenic quality, tranquillity, remoteness, rarity, cultural associations, history, conservation and recreational interests, and broader social, economic and environmental aspects.

4.17 The definition of landscape value has been derived from best practice guidance and the SPG, which defines Landscape Value as "*the intrinsic value that is attached to a landscape, often reflected in designation or recognition. It expresses national or local consensus as to the (degree of) importance of a landscape, for reasons including landscape quality, scenic (or visual) quality, wildness and tranquillity, natural and cultural heritage interests, cultural associations and recreational opportunities*."

4.18 The following criteria outline the general principles that are used to inform and guide the assessment of Landscape Value:

- ***Outstanding Landscape Value***: Such landscapes may be outstanding because of factors such as dramatic scenic quality, or unspoilt beauty. They may also contain rare cultural or historic features, have notable cultural associations, important geological features or contain a large proportion of high quality habitats. They are likely to be in good condition, with a distinctive sense of place, and may be of national or international importance that is evidenced by statutory designation;
- ***High Landscape Value***: Such landscapes may be aesthetically pleasing and have positive characteristics including features that are unspoilt and in good condition, a high proportion of sites that are of geological or ecological interest, notable historic associations and a strong sense of place. These

areas may be of national or regional importance that is evidenced by relevant statutory designations;

- ***Moderate Landscape Value***: Such landscapes may have overall good aesthetic qualities, with some intact characteristic features, but with other features that are not in optimum condition, or which are fragmented or spoilt. These areas may contain a smaller number of features of interest and may be of local importance;
- ***Low Value***: Such landscapes may be in poor condition, or have undergone change to the extent that they do not have a distinctive or coherent character, aesthetic quality or strong sense of place. Few characteristic features are likely to remain intact and features may be highly fragmented or spoilt. These areas may contain a limited number of notable features or associations and are unlikely to be statutorily designated.

Landscape Sensitivity

4.19 The SPG defines 'Landscape Sensitivity' as a term based on the inherent sensitivity of landscape receptors to changes in both landscape character and visual terms, and which, in EIA terms, can also be used to encompass the value placed upon landscape. This definition has been updated by the GLVIA[3] which advises that sensitivity should be clearly separate from value. It should combine judgements on the susceptibility of landscape receptors to change caused specifically by the Development with the Value attached to the landscape in question. Therefore, in the context of this LVIA judgements on Landscape Sensitivity consider the susceptibility of landscape receptors to the changes caused specifically by the Development. The LVIA takes account of the stability and resilience of LCAs to withstand change and recuperate from loss or damage to their character elements resulting from the Development without unacceptable detrimental effects on overall character. An understanding of how different landscape attributes interact assists in defining if, and how, wind farm development may be suitably placed in the landscape. It also allows choices to be made on suitable turbine layouts and sizes of wind farms, which vary according to the characteristics of the receiving landscape. Key landscape attributes that are likely to influence sensitivity to wind farm developments include:

- ***Scale and Enclosure:*** The perception of the size and presence of various character elements, such as landform, trees and houses, against which the relative scale of larger features such as wind turbines are perceived. Consideration is given to whether the landscape is open or enclosed, the range of views (e.g. close, medium or long range), and the extent to which elements such as topography and vegetation provide screening. Landscapes that are visually contained may be less sensitive, although close range views from populated areas may increase sensitivity. A Proposed Development

[3] The Landscape Institute and IEMA (April 2013) *'Guidelines for Landscape and Visual Impact Assessment 3rd Edition' section 5.39*

should be of a size and layout that is in keeping with the receiving landscape character;

- ***Skyline:*** The extent to which people's eyes are drawn towards the skyline depends on the simplicity or complexity of the skyline and whether there are other elements or foci distributed in the view and/ or along the skyline. Where they are visible, skylines are often important character components, and wind farm developments should relate well to them;
- ***Landscape Pattern:*** Understanding the complexity of a landscape can help to determine how a development might relate or conflict with the character of the receiving landscape. A landscape may have a simple composition, such as open moorland, or be more complex, for example, a rugged landscape containing many peaks, or a mosaic of land uses. New development should be designed to relate well to any strong existing landscape patterns, such as hedgerow networks or drainage ditches;
- ***Remoteness and Tranquillity:*** The introduction of turbines may not only result in physical effects on the landscape but, together with the movement of blades, may impact on the perceived sense of remoteness and tranquillity. The extent to which a landscape is remote or tranquil is considered in the assessment of Sensitivity;
- ***Features of Interest:*** The presence of natural and cultural heritage features, such as designated habitats, archaeological sites, and specific cultural associations, which serve to make a landscape particularly special or unique. New developments should not diminish the enjoyment of these features;
- ***Manmade Influence:*** Some landscapes may contain existing, sometimes large-scale elements, such as buildings and structures, commercial forestry and transport infrastructure, which indicate the extent to which the character is already shaped by man. This may influence how the landscape would be affected by wind farm development. A mix of different man-made elements may lead to visual confusion or interruption. Landscapes which are already heavily influenced by man-made elements may also be less sensitive to wind farm development, although close proximity to settlement may also increase sensitivity;
- ***Rarity*** is the frequency, or density of rare or unusual landscape features which serve to make a landscape particularly special or unique;
- ***Quality*** is influenced by the physical state of the existing landscape, its intactness and its ability to repair after loss. High quality landscapes may be more or less sensitive to change depending on the robustness of their individual character elements;
- ***Value:*** The value attributed to the landscape is an important factor to be considered when assessing the sensitivity of a given landscape.

4.20 The consideration of each of the key landscape attributes described above enables a considered judgement to be made on the level of sensitivity to be apportioned to each defined LCA within the Study Area. The level of sensitivity relates specifically to the Development. The following criteria outline the general principles that are used to inform and guide the assessment of Landscape Sensitivity:

- ***High Landscape Sensitivity:*** A landscape where the majority of attributes are unlikely to withstand change without causing a change to overall landscape character to the extent that it would be difficult or impossible to restore. The frequency and sensitivity of receptors may be high but not exclusively so;
- ***Medium Landscape Sensitivity:*** A landscape with a combination of attributes that is capable of absorbing some degree of change without affecting overall landscape character. There are unlikely to be large numbers of sensitive receptors;
- ***Low Landscape Sensitivity:*** A landscape where the majority of attributes are robust and/ or tolerant of change to the extent that change or development would have little or no effect on overall landscape character. It is likely to be easily restored and the frequency and sensitivity of receptors may be Low but not exclusively so.

Baseline Characterisation: Visual Character

4.21 The visual context of the site is described and a ZTV is established to indicate where all, or part of, the Development is likely to be visible from. A ZTV is a map-based diagram of where and how many wind turbines, or wind farms, would theoretically be visible from all parts of the Study Area. The ZTV is first used to assist the identification of areas with theoretical visibility and the location of viewpoints as part of the Baseline Assessment. It is then used to aid the assessment of visual effects because the turbines would be the most visible element of the Development, particularly during the operational period.

4.22 The ZTV is created using computer-generated contour data at 50 m intervals (Ordnance Survey of Northern Ireland's digital terrain model, or 'DTM'). A three-dimensional computer model of the Development is created and accurately located within the DTM. Categories of theoretical visibility are indicated using different colours, for example, areas with theoretical visibility of all the proposed turbines would be indicated by one colour, and areas with visibility of lesser numbers of turbines would be indicated by contrasting colours. The computer model takes account of the effect the curvature of the earth would have on visibility, and is based on a viewing height of 2 m.

4.23 ZTV diagrams are based on the visibility of either the turbine blade tips or hub height. Blade tip visibility means that any area where the tip of the blade is theoretically visible is indicated on the diagram. It shows the highest potential levels of theoretical visibility. This approach is in accordance with the SNH recommendation to err on the

side of over-representation of potential effects. However, it does not necessarily illustrate the most realistic levels of visibility because blade tips may be counted even where they protrude only a small amount above a skyline and this type of visibility will alter as the turbines rotate. Hub height diagrams represent a more realistic illustration because they show theoretical visibility of all points of the turbines to the hub/ nacelle, and therefore also include the upper parts of the turbine blades as a minimum. A Reverse ZTV diagram is used as a clear means of illustrating the parts of the Study Area where no turbines would be visible.

Viewpoint Selection

4.24 Viewpoints are chosen as part of the Baseline Assessment to provide a representative sample of viewers (receptors) and types of views of the Development across the Study Area and, most importantly, to demonstrate potential views of the Development rather than to show the screening effect of landscape features. Viewpoints are always selected in publicly accessible locations and those frequented by members of the public, such as public rights of way, car parks, popular visitor attractions and views from settlements, as well as viewpoints located in particularly scenic areas, are favoured because these are likely to represent a greater concentration of sensitive visual receptors. Viewpoints from which the Development is likely to be prominent are also favoured if they are available. Private residential views are represented where relevant and possible by the selection of appropriate viewpoints on public roads in proximity to residential receptors. This is in accordance with current best practice guidance. A selection of Provisional Viewpoints (PVPs) is identified through the Baseline Assessment. These are assessed through an initial site survey and those that are most representative of typical views, locations and receptors across all parts of the Study Area that fall within the ZTV are retained from more detailed assessment in the LVIA. The viewpoint selection process for this project is described in Technical Appendix 4.4 and illustrated on Figure 4.3.

4.25 When carrying out viewpoint surveys, the nature of the view is noted, whether partial or full views of the Development would be experienced, whether views are static or transitory, how prominent the Development may be, and whether large numbers of properties or viewers would experience such views. In many cases finding an uninterrupted view can be difficult and viewpoint locations where there is a significant amount of existing screening or no safe stopping place (e.g. on a busy road) are generally not shortlisted. This is to ensure the safety of both the surveyor and any third parties, such as the planning authority and members of the public, who may wish to visit the viewpoints. Therefore, although the views chosen are representative they cannot always be typical of the whole Study Area.

4.26 Viewpoint locations are illustrated in all the Figures which accompany the LVIA and the process for producing these illustrations is described in detail in paragraph 4.42 below.

Summary Description of the Development

4.27 Details of the Development and its associated infrastructure are described in detail in Chapter 1 of this ES and summarised briefly in relation to landscape and visual effects in Chapter 4, paragraph 4.20. To ensure that visual effects are minimised, factors such as layout and turbine specification, colour scheme, rotation pattern of blades, uniformity and infrastructure design may be considered. The Development is considered from the perspective of the shortlisted viewpoints.

Assessment of Effects on Landscape Character

4.28 Landscape effects may include direct physical changes to landscape elements caused by the Development or indirect effects, such as effects on the setting of a particular landscape that may arise as a consequence of the Development. The potential landscape effects across the Study Area are identified by the on-site analysis and verification of landscape character information gathered as part of the Baseline Assessment. The landscape assessment criteria described below provides a framework for the assessment of landscape effects. It must be noted that there may be exceptions to these broad categories due to specific local characteristics that may apply in individual circumstances. This LVIA does not seek to determine whether the potential landscape effects of the Development would be beneficial or adverse because this is a subjective matter that depends very much on the viewer's own opinion.

Magnitude of Landscape Effects

4.29 The Magnitude of effect on landscape character is defined as the degree of change that would result from the introduction of the Development in terms of size or scale, geographical extent of the area that would be influenced, and the duration and reversibility of the proposed change. It is dependent on a number of factors, including:

- The degree to which landscape character elements would be altered by the Development;
- The number of turbines and their prominence within the landscape;
- Whether effects would have a direct physical effect on a landscape or indirectly affect its character by having an effect on its setting;
- The distance of the Development from the LCA in question;
- The duration, permanence and extent of the effect in physical terms.

4.30 The following criteria outline the general principles that are used to inform and guide the assessment of the Magnitude of landscape effects:

- ***High Landscape Magnitude***: The Development would be immediately apparent and would result in substantial loss or major alteration to key elements of landscape character to the extent that there is a fundamental

and permanent, or long-term, change to landscape character. The change may occur over an extensive area;

- ***Medium Landscape Magnitude***: The Development would be apparent in the view and would result in loss or alteration to key elements of landscape character to the extent that there is a partial long-term change to landscape character. The change may occur over a limited area;
- ***Low Landscape Magnitude***: The Development would result in minor loss or alteration to key elements of landscape character to the extent that there may be some slight perception of change to landscape character. The change may be temporary and occur over a limited area;
- ***Negligible Landscape Magnitude***: The Development would result in such a minor loss or alteration to key elements of landscape character that there would be no fundamental change.

Significance of Landscape Effects

4.31 The EIA Directive requires the LVIA to identify and assess the acceptability of significant effects. Best practice guidance recognises that the significance of effects is not absolute and is related specifically to the Development. It is also dependent on the points considered within the landscape sensitivity appraisal, the factors that influence the Magnitude of change, and the relationship between Landscape Sensitivity and Magnitude of Landscape Effect.

4.32 This LVIA uses the following criteria to inform and guide the assessment of the Significance of Landscape Effects:

- ***Significant Landscape Effects:*** Effects that would occur when the majority of landscape attributes are deemed to be highly sensitive and the magnitude of change would alter landscape character to the extent that it would become defined, or considerably influenced, by the presence of the Development;
- ***No Significant Landscape Effects***: Effects would not be significant when the majority of landscape attributes are not deemed to be highly sensitive and where the Development would have little, or no, effect on existing landscape character. This would also occur where the Development can be integrated into the existing Study Area without the loss of key landscape attributes landscape effects. Where the Development is easily noticeable but the number and sensitivity of landscape attributes decreases, so landscape character will become less defined by the Development and more so by other landscape attributes.

Assessment of Visual Effects

4.33 Visual effects relate to changes in the composition of views and people's responses to these changes. It is evident from research, and publications on public attitudes to wind farms, that opinions vary greatly, ranging from strongly adverse to strongly

positive, depending on the type and nature of effects and individual perceptions. This LVIA does not seek to determine whether the potential visual effects of the Development would be beneficial or adverse because this is a subjective matter that depends very much on the viewer's own opinion. The assessment criteria described in this section below provides a framework for the assessment of visual effects. It is noted that there may be exceptions to these broad categorisations due to specific characteristics that may apply to individual circumstances.

4.34 The potential visual effects across the Study Area are identified in four stages:

i. ZTV diagrams are created. A desk-based analysis of these is carried out in order to gain a broad understanding of the nature of visibility in the Study Area, and to identify provisional viewpoint locations. Wirelines are created as working drafts for all provisional viewpoints;

ii. The ZTVs and viewpoint locations are verified on site. The presence of screening elements, such as vegetation, is noted because this is not reflected by the ZTVs bare-ground representation of visibility. Key visual receptors within the Study Area are identified during the site survey, and the assessment of potential visual effects on each of these receptor groups is made. Visual receptors may include, for example, people within settlements, on vehicular routes, at tourist destinations, etc. The viewpoints are assessed for the extent to which they provide truly representative views of the key visual receptors and typical views within the Study Area.

iii. In most cases photographs are taken from each viewpoint location. However, in accordance with SNH guidance, viewpoint locations beyond 20 km from the Development may not require photomontages where the proposed turbines are below 150 m in height and where they are unlikely to be perceptible features in the view. A judgement on which viewpoints require photomontages is made on a case-by-case basis in each LVIA;

iv. Finally, a detailed assessment of visual effects is made from each viewpoint. This is assisted by computer-generated wirelines (all viewpoints) and photomontages (for most viewpoints with the exception of those described in point iii above), which provide as realistic as possible visualisations of how the Development would appear within each viewpoint, and which are presented as Figures in the Environmental Statement.

Assessment of Viewpoints

4.35 From each viewpoint a description is provided of the existing view and potential changes that would result from the Development. The effect of the Development on the existing view is then assessed. The following elements are considered in the description and assessment of visual effects from each viewpoint:

- The existing visual character and quality of the viewpoint (including whether it is within a designated landscape, the presence of visual detractors, etc.);
- The character of the existing landscape against which the turbines would be viewed including any screening provided by existing surface features, vegetation and local topography;
- The viewpoint location, the presence and concentration of receptors, and receptor sensitivity (for example, would people view the site during work or leisure activities, whilst in transit, etc.);
- The number of turbines that would be visible, their scale, distance from the viewpoint and their position in the view in relation to other features in the viewpoint;
- The duration of the potential effect, i.e. is it long term or temporary, continuous or transitory (the latter meaning that the receptor would be exposed to the effect for a short time);
- Whether effects would occur during construction and decommissioning of the Development.
- The presence of existing wind farms, particularly those in close proximity to the Development, are considered as part of the assessment of visual effects as well as the assessment of cumulative visual effects.

Sensitivity of Visual Receptors

4.36 The Sensitivity of visual receptors is dependent on the nature of the receptor and the value of the view, including other landscape elements within it. The following criteria, which are drawn from current best practice guidance (Technical Appendix 4.1), outline the general principles that are used to inform and guide the assessment of visual sensitivity at each viewpoint:

- ***High Visual Sensitivity***: would typically include residents of individual dwellings within the countryside which may be located in order to take advantage of high quality landscapes or views. Views from such properties are likely to be static and the main view may be orientated towards the Development and likely to be experienced for long periods of time; people undertaking recreation where the landscape within which the Development is seen is the primary reason for attraction (for example, walkers, cyclist and drivers on classified scenic driving routes). Receptors are more likely to be within a designated landscape and could be attracted to visit more frequently, or stay for longer, by virtue of the view;
- ***Medium Visual Sensitivity***: would typically include people undertaking active recreational pursuits where the wider landscape within which the Development is not seen as the primary reason for attraction (e.g. golf, water sports, theme and adventure parks, historic sites, parks and gardens). Receptors are less likely to be within a designated landscape and could be

attracted to visit more frequently or stay for longer by virtue of the facilities and features of the particular attraction rather than by the value of the view;

- ***Low Visual Sensitivity***: would typically include receptors in vehicles that would experience transitory views whilst travelling at speed for reasons other than the enjoyment of landscape or visual quality (excluding those using scenic driving routes). Their use of the road network may be enhanced by landscape and visual quality but would also be heavily influenced by manmade elements, the roads themselves and the traffic on them. These may themselves be of detriment to landscape quality, particularly where road corridors are in poor physical quality or where noise from busy traffic detracts from the tranquillity of the landscape; outdoor workers (e.g. farm and forestry workers) who are mobile and engaged in active work. The quality of landscape and visual character would not influence their presence or length of stay although they are likely to spend prolonged periods of time outdoors; people in indoor workplaces and community facilities who would spend only short periods of time in the landscape for reasons that are not related to or significantly affected by landscape and visual quality. They would experience temporary or transitory views whilst engaged in other activities. This group of receptors may include churchgoers, customers at petrol stations and garages, public houses, leisure centres and other community facilities; residents within larger settlements. Their locations are unlikely to be governed by landscape and visual quality and their views may be heavily dominated by manmade urban and suburban elements. Receptors are unlikely to be within a designated landscape and are most likely to be present at a given viewpoint by virtue of some other need or necessity unrelated to the appreciation of the landscape or visual value.

Magnitude of Visual Effects

4.37 The Magnitude of effect on visual character is defined as the degree of change that would result from the introduction of the Development. It is dependent on a number of factors, including:

- The prominence of the Development within the view;
- The number of turbines and extent of the Development that would be visible;
- The angle and elevation of the view;
- The proportion of the view that is affected by the Development;
- The scale and character of the landscape in which the Development would be viewed;
- The duration, permanence and frequency of available views.

4.38 Factors such as the distance of a wind farm from a viewpoint, weather conditions, time of day/year, angle of view, and composition of other elements in the view, all contribute to the assessment of visual effects. This LVIA uses these factors to define levels of visual prominence as follows:

- ***Visually Dominant***: The Development would occupy a commanding or elevated position and would seem to tower above the surrounding landscape from the viewpoint in question and/or from the surrounding landscape. The Development would become more important or noticeable than anything else in the view.
- ***Visually Prominent***: The Development would be immediately noticeable and likely to attract attention due to its size or position within the view.
- ***Visible***: The Development would be evident and perceptible from the viewpoint in question and/or from the surrounding landscape but would not be a prominent feature.
- ***Not Visible***: The Development would not be seen or would not be immediately apparent to the naked eye.

4.39 The following criteria outline the general principles that are used to inform and guide the assessment of the Magnitude of visual effects:

- ***High Visual Magnitude***: The Development would be a dominant and immediately apparent feature that would affect and change the overall character of the view and to which other features would become subordinate;
- ***Medium Visual Magnitude***: The Development would form a visible and recognisable new element within the overall view and would be readily noticed without changing the overall nature of the view;
- ***Low Visual Magnitude***: The Development would form a component of the wider view that might be missed by the casual observer. Awareness of the Development would not have a marked effect on the overall quality of the view;
- ***Negligible Visual Magnitude***: The Development would be barely perceptible, or imperceptible, and would have no marked effect on the overall quality of the view.

Significance of Visual Effects

4.40 The EIA Directive requires the LVIA to identify and assess the acceptability of significant effects. Best practice guidance recognises that the significance of effects is not absolute and is related specifically to the Development. It is also dependent on the points considered within the appraisal of sensitive visual receptors, the factors that influence the magnitude of change, and the relationship between Visual Sensitivity and Magnitude of Visual Effect.

4.41 This LVIA uses the following criteria to inform and guide the assessment of the Significance of Visual Effects:

- ***Significant Visual Effects***: Effects that would occur when the majority of visual receptors are deemed to be highly sensitive and the magnitude of change would alter visual character to the extent that it would become defined, or considerably influenced, by the presence of the Development;
- ***No Significant Visual Effects***: Effects would not be significant when the majority of visual receptors are not deemed to be highly sensitive and where the Development would have little or no effect on existing views. The Development would be likely to constitute a minor component of the wider view, which might be missed by the casual observer, and awareness of the Development would not have a marked effect on the overall quality of the view. Where the Development is easily noticeable but the number and sensitivity of visual receptors decreases, so overall visual character will remain less defined by the Development and more so by other elements of the existing view.

Production of Viewpoint Visualisations: Wirelines and Photomontages

4.42 Computer-generated wirelines and photomontages are used to assist the assessment of potential visual effects by providing an accurate impression of the scale, size and appearance of the turbines from the chosen viewpoints. .

4.43 A wireline model of the Development and surrounding terrain is generated from each viewpoint using specialist software - RESoft Wind Farm R4, map tiles and digital terrain data provided by Ordnance Survey of Northern Ireland, the proposed turbine layout, and individual turbine geometry. Turbine blades are displayed at an angle of 0º, i.e. the uppermost blade is always shown pointing directly upwards, in order to demonstrate the highest possible level of blade tip visibility. Cumulative wind farms and single turbines within the Study Area are shown on the wirelines. The wireline model is an accurate model of the bare-ground topography. Land cover elements are then overlaid onto this model in the form of photographs, which are taken at each viewpoint location. Both the wireline and photograph cover a minimum 80º - 180º angle of view depending on the actual extent of the view on site. For example, the view on site may be constrained on both sides by tall vegetation or be part of a wider panorama. A 50º - 53.5º view is generally accepted as the normal viewing angle of the human eye[4].

4.44 In accordance with best practice guidance all photographs are taken with a full frame digital Single Lens Reflex (SLR) camera and a digital lens focal length of 50 mm (to provide as accurate a representation of the human eye as possible). The largest possible aperture setting is used to ensure the maximum level of detail in the view is

[4] Paper presented to British Wind Energy Association Conference by K. Hawkins of E4environment Ltd and Dr P. Marsh of Environmental Data Analysis (2001) 'The Camera Never Lies' and Scottish National Heritage (2017) 'Visual Representation of Wind Farms'

shown. A panoramic tripod head is used to obtain true horizontal alignment of the photographs and maintain a constant height above ground (1.5 m).

4.45 Accurate records are taken on site of weather conditions and time of day. Viewpoint coordinates are recorded using a hand-held Global Positioning System (GPS, accurate to 3.65 m). These are refined through the use of GIS software and Google Maps to achieve a greater degree of accuracy.

4.46 The photographs are merged together and the resulting image is imported into the software programme where it provides the backdrop to the wireline. The wireline terrain data may differ slightly from that pictured in the photograph due to deficiencies in the digital terrain model data (DTM). This can cause the turbines to appear slightly above or below the ground. Therefore minor adjustments may be made to the software settings to ensure that the photograph and wireline match before the turbines are rendered consistently with model data. The wireline is then hidden so that only the finished photomontage is visible.

4.47 Visualisations are prepared in accordance with the SNH and Landscape Institute best practice guidance as far as practical. SNH's best practice guidance recommends that the following information on the limitations of visualisations is included in all LVIA methodologies[5]:

- *"Visualisations of wind farms have a number of limitations which you should be aware of when using them to form a judgement on a wind farm proposal. These include:*
- *A visualisation can never show exactly what the wind farm will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;*
- *The images provided give a reasonable impression of the scale of the turbines and the distance to the turbines, but can never be 100% accurate;*
- *A static image cannot convey turbine movement, or flicker or reflection from the sun on the turbine blades as they move;*
- *The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations;*
- *To form the best impression of the impacts of the wind farm proposal these images are best viewed at the viewpoint location shown;*
- *The images must be printed at the right size to be viewed properly (The visualisations in this LVIA are 130 mm x 42 mm at A3);*
- *You should hold the images flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, you should stand at arm's length from the image presented to gain the best impression.*
- *It is preferable to view printed images rather than view images on screen. If you do view images on screen you should do so using a normal PC screen*

[5] Scottish National Heritage (2017) 'Visual Representation of Wind Farms', Annex A: Information on limitations of visualisations

with the image enlarged to the full screen height to give a realistic impression. Do not use a tablet or other device with a smaller screen to view the visualisations described in this guidance."

4.48 In many scenarios wind farms are visible as elements of wide angle views which can only be appreciated if viewers turn their heads from side to side or move through the landscape. Wirelines and photomontages show the turbines in accurate proportion to other visual elements. However, the overall scale of the view is reduced by the practical need to illustrate the view on a single sheet of paper that allows as many people as possible to have fair and easy access to the published Environmental Statement. Features that are of note in wider views, but which are beyond the angle that can be illustrated in the viewpoint figures, such as other wind farms, are included in the detailed written descriptions of viewpoints in the LVIA report. Photomontage figures should be reproduced at a minimum of 300 pixels per inch to ensure best quality representation of the viewpoints.

4.49 It must be noted that the purpose of wirelines and photomontages is to help the assessor establish what the Development's visual effect might be by providing a 'snapshot' of what the Development would look like within the landscape. They should always be viewed in conjunction with the LVIA report which provides a detailed written assessment of visual effects, as well as a visit to all of the viewpoints in appropriate weather conditions. Wirelines are not intended to be visually representative images but they are generally accepted as an illustrative digital imaging tool. They provide a good indication of the location of turbines within the landscape and their relationship with the Cumulative Baseline of other wind farms in the Study Area. If these limitations are recognised, visualisations can be accepted as adequate representations for the purpose of the LVIA.

Assessment of Effects of the Proposed Layout on the Site

4.50 This LVIA is primarily concerned with the operational phase of the Development. However, consideration is also given to the potential effects during construction and decommissioning. During the construction period a number of activities would occur that may temporarily or permanently affect the physical landscape or visual amenity of the Study Area. Temporary effects may only last for the duration, or part of, the construction period and may include effects such as the visibility of construction traffic, plant, and stockpiled materials. If managed adequately these construction effects can be minimised or avoided. Permanent effects would result from irreversible physical changes to the site such as the removal of vegetation, alteration of landform and new access arrangements.

4.51 Details of the Development and its associated infrastructure are described briefly, starting at paragraph 4.20 and in more detail in Chapter 1. Mitigation measures to avoid or minimise both temporary and permanent effects are proposed from paragraph 4.226.

Design Evolution and Mitigation Measures

4.52 During the course of the EIA the layout of the Development may change as part of an iterative assessment and design process. Liaison between all parties involved in the EIA is a key part of this process and the LVIA takes cognisance of the findings of other chapters, such as Archaeology and Cultural Heritage. Mitigation measures which seek to avoid, reduce, or compensate for landscape and visual effects would generally be implemented as part of this process and may include, for example, changes to layout and turbine specification, colour, uniformity of layout, under-grounding of onsite power cables, and infrastructure design. Following the implementation of mitigation measures in relation to physical site constraints (e.g. the presence of protected species, hydrological features, etc.) the Development would be considered from the perspective of the identified viewpoints. The computer-generated wirelines would be used to examine initial designs and identify opportunities to improve the layout in visual terms where necessary.

4.53 Further mitigation proposals, including any potential enhancement of landscape and visual character, will be made, where possible and appropriate, to address any potential effects which would remain with the final layout. It is important to note that the scope for mitigating the visual effect of wind farms is greatly restricted by the functional siting requirements, the scale of the turbines, and the characteristic movement of the blades.

Assessment of Residual Landscape and Visual Effects

4.54 Where mitigatory design proposals are implemented in order to reduce significant landscape and visual effects, the resulting reduction in effects is assessed and described in paragraph 4.228.

Assessment of Cumulative Effects

4.55 In relation to LVIAs of individual developments, cumulative effects are taken to mean *"the additional changes caused by a proposed wind farm in conjunction with other similar developments"*[6].

4.56 "*The purpose of a Cumulative Landscape and Visual Impact Assessment (CLVIA) is to describe, visually represent and assess the ways in which a wind farm would have additional impacts when considered in addition to other existing, consented or proposed windfarms. It should identify the significant cumulative effects arising from the proposed wind farm*"[7]. In other words, the purpose of the cumulative impact assessment is to measure the incremental effect of the Development on the Cumulative Baseline rather than to assess the combined effects of all, or some, of the Cumulative Baseline with the Development.

[6] Scottish Natural Heritage (March 2012), '*Assessing the Cumulative Impacts of Onshore Wind Energy Developments*' paragraph 7, paraphrased from the GLVIA para 7.12

[7] Scottish Natural Heritage (March 2012), '*Assessing the Cumulative Impacts of Onshore Wind Energy Developments*', paragraph 55

4.57 The Cumulative Baseline comprises existing, consented and proposed (in-planning) wind farms in an appropriate cumulative Study Area. In this LVIA the cumulative Study Area extends to a 30 km radius (see Technical Appendix 4.5 and Figure 4.4). Particular attention is paid to clusters of wind farms because these are already likely to be prominent features. Existing single turbines are noted as features within the existing landscape and visual baseline, and in particular if they appear within selected viewpoints. Existing and consented turbines are included on the wirelines and ZTV diagrams where they are located within 5 km of the Development.

4.58 It must be noted that cumulative effect of some magnitude is largely unavoidable in any Study Area which contains existing wind farms and a judgement must be made on the relative and appropriate weight that is given to the various elements of the actual and assumed Cumulative Baseline. Current best practice guidance[8] makes it clear that this baseline should extend to operational and consented schemes but not necessarily to those which are the subject of undetermined applications for planning permission. Existing and consented wind farms are generally considered to be part of baseline landscape and visual character and the effects of the Development take consideration of their presence, or anticipated presence. The incremental effect of the Development on a Cumulative Baseline which includes other proposed wind farms is also considered. However, it is noted that applications for planning permission may be rejected and therefore, if a scheme is not yet approved, relatively limited weighting should be afforded to it when assessing the incremental effects of the Development. This LVIA includes existing, consented and proposed wind farms in its cumulative assessment but the weight afforded to individual schemes is a matter for the decision maker based on the evidence presented in the LVIA.

4.59 The assessment criteria described in this section provides a framework for the assessment of cumulative landscape and visual effects. It is noted that there may be exceptions to these broad categorisations due to specific characteristics that may apply to individual circumstances.

Assessment of Cumulative Landscape Effects

4.60 Cumulative landscape effects relate to the incremental degree of change to the existing landscape character or physical fabric of the Study Area that would result from the introduction of the Development over and above that of the Cumulative Baseline. The magnitude of cumulative change to landscape character is dependent on a number of factors, including:

- The presence, appearance and interrelationship of other cumulative wind farms and turbines in the Cumulative Baseline, and the degree to which this already influences landscape character;
- The incremental change to landscape character elements that would be caused by the Development;

[8] Including PPS18 at paragraph 1.3.37 and the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017

- The incremental effect of the Development on the overall number of turbines, their prominence within the landscape, and their effect on landscape scale;
- Whether effects are direct or indirect;
- The distance of the Development from the LCA in question, and from other cumulative wind farms that may also affect the LCA in question;
- The duration, nature, permanence and extent of the effect in physical and visual terms;
- The value attached to the landscape in question, including any landscape designations.

Magnitude of Cumulative Landscape Effects

4.61 The following criteria outline the general principles that are used to inform and guide the assessment of the Magnitude of Cumulative Landscape Effects:

- ***High Cumulative Landscape Magnitude***: The introduction of the Development to the Cumulative Baseline would be immediately apparent and would result in substantial incremental loss of, or major alteration to, key elements of landscape character to the extent that there would be a fundamental and permanent, or long-term, change to landscape character. The change may occur over an extensive area;
- ***Medium Cumulative Landscape Magnitude***: The introduction of the Development to the Cumulative Baseline would be immediately apparent and would result in the incremental loss of, or alteration to, key elements of landscape character to the extent that there would be a partial long-term change to landscape character. The change may occur over a limited area;
- ***Low Cumulative Landscape Magnitude***: The introduction of the Development to the Cumulative Baseline would result in minor incremental loss of, or alteration to, key elements of landscape character to the extent that there may be some slight perception of change to landscape character. The change may be temporary and occur over a limited area;
- ***Negligible Cumulative Landscape Magnitu***de: The introduction of the Development to the Cumulative Baseline would result in such a minor incremental loss of, or alteration to, key elements of landscape character that there would be no fundamental change to landscape character.

Significance of Cumulative Landscape Effects

4.62 The Significance of Cumulative Landscape Effects is dependent on the points considered within the landscape sensitivity appraisal, the factors that influence the Magnitude of change upon it, and the relationship between landscape Sensitivity and Magnitude of cumulative landscape effect. The following criteria outline the general

principles that are used to inform and guide the assessment of the Significance of cumulative landscape effects:

- ***Significant Cumulative Landscape Effects***: Effects that would occur when the majority of landscape attributes are deemed to be highly sensitive and the incremental effects of the Development would alter landscape character to the extent that it would become defined or considerably influenced by the presence of wind farms, taking account of Cumulative Baseline conditions;
- ***No Significant Cumulative Landscape Effects***: Effects would not be significant when the majority of landscape attributes are not deemed to be highly sensitive and where the Development would have little or no incremental effect on the existing landscape character. Where the Development can be integrated into the existing Cumulative Baseline, without the loss of key landscape attributes, cumulative landscape effects would also be deemed as Not Significant. This level of significance would also occur where the Development is easily noticeable but its incremental effects would not cause the landscape character to become more defined by wind farms than it currently is, or to become more defined by wind farms than by other landscape attributes.

Assessment of Cumulative Visual Effects

4.63 Cumulative visual effects relate to the degree to which wind energy developments feature in particular views or sequences of views, and the resulting effects of this upon visual receptors. Current best practice guidance advises that the potential receptors of cumulative visual effects should be identified and the most significant receptors selected for detailed assessment. This LVIA considers simultaneous and sequential cumulative visual effects that may arise within the Study Area, and in relation to the selected viewpoints. The presence of existing wind farms and turbines, particularly those that are closely related to the Development, are considered as part of the assessment of visual effects as well as the assessment of cumulative visual effects.

4.64 Simultaneous cumulative visibility is the extent to which the Development would be visible with one or more other cumulative wind farms from a single location, either in the same or different directions. Sequential cumulative visibility is the extent to which the Development would be viewed in succession with one or more other cumulative wind farms by receptors travelling through the landscape, regardless of whether or not the sites themselves are inter-visible.

4.65 The LVIA principally considers the degree to which the Development would contribute to wind energy development becoming a significant or defining characteristic of visual character. The sensitivity of visual receptors remains the same as that already defined in the visual effect assessment because the visual resource is unaltered.

Different criteria are used for assessing Magnitude and Significance of Cumulative Visual Effects.

Magnitude of Cumulative Visual Effect

4.66 The Magnitude of cumulative visual effect is dependent on a number of factors, including:

- The nature of the Cumulative Baseline, i.e. the presence, appearance and intervisibility of existing, consented and proposed developments;
- The incremental effect that the Development would have on the prominence and distance of wind farms from visual receptors;
- The incremental effect that the Development would have on the number of turbines and the extent of wind farms that can be seen simultaneously, or sequentially;
- The incremental effect that the Development would have on the proportion of the view that is affected by wind turbines and the number of wind farms and turbines that would be visible in their entirety or otherwise;
- The visual relationship between the Development and other wind farms and turbines, including separation distances between wind farm developments;
- The scale and character of the landscape in which the Development would be viewed alongside the Cumulative Baseline;
- The nature of available views, including angle of view, prominence, screening elements, elevation, and distance from the viewpoint location.
- The duration, frequency and permanence of available views, including whether the potential cumulative effect is likely to be frequent (i.e. it would occur regularly, repetitively, or with short time lapses between occurrences) or occasional (i.e. it would occur infrequently, with long time lapses or distances between occurrences);
- Whether the viewer would need to look in the same direction or different directions to obtain cumulative views;
- The speed and mode of travel of visual receptors, and duration of cumulative views.

4.67 The following criteria outline the general principles that are used to inform and guide the assessment of the Magnitude of cumulative visual effects:

- ***High Cumulative Visual Magnitude***: The Development would increase the scale of wind turbines in the landscape to a level at which the view would become dominated by wind farms;
- ***Medium Cumulative Visual Magnitude***: The Development would result in a noticeable increase in turbines but this increase would not result in wind farms being the dominant feature of the view;

- ***Low Cumulative Visual Magnitude***: The Development would be visible but would constitute a component of the view that might be easily missed by the casual observer and/ or would not contribute to the overall prominence of wind farms within the view;
- ***Negligible Cumulative Visual Magnitude***: The Development would be barely perceptible, or imperceptible, and/ or would have no effect on the perception of wind turbines within the view.

Significance of Cumulative Visual Effect

4.68 The Significance of cumulative visual effects is dependent on the points considered within the appraisal of sensitive receptors, the factors that influence the Magnitude of cumulative visual effects, and the relationship between visual Sensitivity and Magnitude of cumulative visual effect. The following general principles are used to inform and guide the assessment of the Significance of Cumulative Visual Effects:

- ***Significant Cumulative Visual Effects***: Effects that would occur when the majority of visual receptors are deemed to be highly sensitive and the addition of the Development to the Cumulative Baseline would result in the view becoming defined, or considerably influenced, by wind turbines;
- ***No Significant Cumulative Visual Effects***: Effects would not be significant when the majority of visual receptors are not deemed to be highly sensitive and where the Development would have little or no incremental effect on existing views. The Development is likely to constitute a barely perceptible, or imperceptible, component of the wider view, which might be missed by the casual observer. Awareness of the Development would not have a marked effect on the overall quality of the view. Where the Development may be a noticeable addition to views containing wind farms in the cumulative baseline but it would not cause the overall visual character of the view to become defined by wind turbines rather than by other elements of the existing view the overall effects would also be deemed to be Not Significant.

Technical Appendix 4.3: Landscape and Seascape Character Areas

4.69 There are twenty Landscape Character Areas (LCAs) and seven Seascape Character Areas (SCAs) within the Study Area. The Development is located within LCA 122 Garron Plateau and a detailed description of this LCA is contained within the Baseline Assessment of the LVIA, Chapter 4.

4.70 There are four other LCAs and 1 SCA are in close proximity to the Development or which contain shortlisted viewpoints. Detailed descriptions of the LCAs are contained within the Northern Ireland Landscape Character Assessment (NILCA) and the SPG to PPS 18. The NILCA classifies the landscape into areas of distinct and separate character called Landscape Character Areas (LCAs), and defines overall Landscape Value. The SPG provides further broad guidance on the LCAs that are defined in the NILCA, including their overall Sensitivity, specifically in relation to wind energy developments. Descriptions of the SCAs are contained within the Northern Ireland Regional Seascape Character Assessment (NIRSCA). The detailed descriptions of the LCAs and SCAs that are contained in the NILCA, SPG and NIRLSCA are not reproduced in this LVIA but Table 4.3.1 summarises the Value and Sensitivity of these areas in relation to the Development. The location of all LCAs and SCAs are shown on Figure 4.2.

Technical Appendix Table 4.3.1: Summary of Landscape and Seascape Value and Sensitivity

Landscape / Seascape Character Area	Value	Overall sensitivity to wind energy development noted in SPG	Sensitivity to the Development
LCA 122 Garron Plateau	Outstanding	High to Medium	Medium. Location of the Development is in an area of lesser sensitivity due to its simple landform and land cover, close proximity to extensive forestry and limited recreational access.
LCA 117 Central Ballymena Glens	High	High	Negligible in the northern half; Medium in the southern half
LCA 118 Moyle Moorlands and Forest	Outstanding	High to Medium	Low
LCA 123 Larne Glens	Outstanding	High	High in proximity to Glencloy but low to negligible elsewhere
LCA 124 Larne Basalt Moorland	Outstanding	High to Medium	Medium to Low

Landscape / Seascape Character Area	Value	Overall sensitivity to wind energy development noted in SPG	Sensitivity to the Development
SCA 23 North Channel	High	Low	Low – Undefined by published NIRSCA but this SCA is located in the open sea approximately 10 – 15 km from the Development. There are a number of coastal SCAs between SCA 23 and the shoreline and coastal LCAs which would provide physical separation between this LCA and the Development. The latter would be located on a broad upland plateau, the scale of which would be extensive in comparison to the Development itself when viewed from this distance across open sea.

4.71 The following 16 LCAs and 6 SCAs have not been assessed in detail because the Baseline Assessment, including site assessment and analysis of provisional viewpoint locations, indicates that they are on the periphery of the Study Area and the ZTV, and/or because they do not contain shortlisted Viewpoints. Such LCAs and SCAs would not be significantly affected by the Development and have therefore not been subject to further detailed assessment.

Technical Appendix Table 4.3.2: LCAs and SCAs not assessed in this LVIA

Landscape / Seascape Character Area
LCA 56 Dervock Farmlands
LCA 58 Long Mountain Ridge
LCA 59 Cullybackey and Clough Mills Drumlins
LCA 60 River Main Valley
LCA 98 Carrickfergus Upland Pastures
LCA 114 Three and Six Mile Water Valleys
LCA 115 Tardree and Six Mile Water Slopes
LCA 116 Ballymena Farmland
LCA 119 Ballycastle Glens
LCA 120 Fair Head

Landscape / Seascape Character Area
LCA 121 Moyle Glens
LCA 125 Tardree Upland Pastures
LCA 126 Larne Coast
LCA 127 Larne Ridgeland
LCA 128 Island Magee
LCA 130 Carrickfergus Farmed Escarpment
SCA 4 Larne Lough
SCA 6 Ballycastle Coast
SCA 8 Torr Head Coast
SCA 9 Northern Glens Coast
SCA 10 Southern Glens Coast
SCA 11 The Gobbins

Northern Ireland Regional Landscape Character Assessment

4.72 A Regional Landscape Character Assessment has also been prepared for Northern Ireland (NIRLCA) and is intended to provide a strategic overview of landscape character that can be used to inform future detailed local studies and that will be updated on a more regular basis than the NILCA. It divides the province into 26 regional landscape character areas that updates and provides further detail on the previous 130 LCAs. However the NIRLCA has yet to be reflected in the development of detailed local studies via the Local Development Plan process and, therefore, the NILCA still provides a greater level of detail and is used as a direct reference point for the SPG.

4.73 The Development is located in the centre of Regional LCA 18: Antrim Plateau and Glens. The boundary of this RLCA is indicated on Figure 4.2. It is described in the NIRLCA as being upland plateaus and hills dissected by nine scenic glacial glens that run down to the sea. The combination of upland edges and river mouths creates a distinct and remarkably scenic coastline. The Development would be positioned on the side of the Garron plateau and would be partially visible from the coastline around Carnlough but more clearly visible overlooking the glens of Glenarm and Glencloy. The north eastern facing coastal settlements retain a strong local character and are culturally close to the west coast of Scotland. The A2 coast road is a popular tourist route which is more accessible than the remote landscape of moorland and bog formed by the plateau. Slemish is noted as being a prominent landmark on the south western edge of this RLCA which provides a point of orientation in the landscape. There are long views from various parts of this RLCA towards the Antrim

and Scottish coast, the Bann Valley, Lough Neagh and the Sperrin Mountains and the Development would appear in conjunction with some such views.

4.74 Visual interest is created by the varied underlying geology in this RLCA with black basalt cliffs and coastal chalk outcrops. There is long standing evidence of human settlement and visible time depth in the landscape from Neolithic sites to present-day settlement, farming, mineral extraction and forestry. The Development itself is partially located within an area of forestry and some areas would be felled to facilitate construction of the access tracks and two of the proposed turbines.

4.75 Renewable energy is described as one of the "Past, present and future forces for change" in this RLCA and this is already evidenced by three clusters of operational wind farms located along its western edge overlooking the adjacent pastoral lowlands around Clough Mills and Ballymena. There are also two consented wind farms located on other areas of the plateau to the south west of the Development (Carnalbanagh wind farm) and on the south eastern edge of the RLCA (Ballykeel wind farm) and a proposed wind farm on the south eastern edge overlooking the coast above Ballygally (Ballygilbert wind farm). The RLCA notes the need for further landscape sensitivity studies to determine the potential for further development within the RLCA without adverse impacts on its character or the AONB.

4.76 Other forces for change in this RLCA include: the effects of climate change on landform, sea levels and coastal processes, woodland cover, the loss of upland bog habitats, and pressures from increased tourist numbers related to warmer drier summers; marine developments including marine renewables; changes to the appearance of traditional field boundaries and land cover as a result of changes to farming practices and new houses; the development of second homes in the countryside and the effects of development related to recreational use of the countryside particularly along the coast; the integrity of peat bogs resulting from historic cutting of peat; forestry; light pollution; mineral extraction including restoration of disused sites; the existence of both a Management Plan and Action Plan for the AONB which should have positive effects if successfully implemented.

4.77 In addition to landscape character as a largely aesthetic quality, the NIRLCA defines a number of 'Ecosystem Services'[9]. Whilst wind farms are recognised as being a past, present and future force for change in RLCA 18 they are also recognised as 'provisioning' ecosystem service that is of benefit to us terms of energy production. Their contribution to mitigating the effects of climate change is not acknowledged in the description of this particular RLCA although it is referred to as such in other RLCA descriptions and is a relevant consideration.

[9] The UK National Ecosystem Assessment (UK-NEA, 2011) defines ecosystem services as "*the benefits provided by ecosystems that contribute to making human life both possible and worth living*".

Technical Appendix 4.4: Viewpoint Selection

Desk-based selection of Provisional Viewpoint Locations

4.78 The Baseline Assessment stage of the LVIA identified locations most likely to experience visibility of the Development and contain key visual receptors due the theoretical levels of visibility indicated by the ZTV diagrams, the potential sensitivity of either the location and / or the visual receptors likely to be present at these locations. The following were identified as being potential key receptors and key parts of the Study Area which should be considered in the search for Provisional Viewpoint locations (PVPs):

- Locations within the Antrim Coast and Glens AONB which, with the exception of Rathlin island, lies almost entirely within the Study Area. AONBs are statutorily designated as nationally recognised high quality landscapes. They are likely to attract visitors by virtue of this designation and contain various visitor amenity sites and attractions;
- Locations from which the Development would be seen within the wider landscape context of the Study Area, i.e. upland parts of the Antrim Plateau from where there are views towards the Sperrins, Lough Neagh, Belfast hills and the North Channel seascape;
- The series of Glens and river valleys which dissect these uplands and which are a defining feature of the AONB, providing a unique sense of place and a physical connection between coastal and upland parts of the landscape;
- Locations from public rights of way, scenic drives and cycling routes where viewers are likely to be present for the primary purpose of appreciating scenic views. Such locations include: the Ulster Way network of waymarked trails across the Antrim Plateau and along the coastline; the National Cycle Network which largely hugs the coast but also includes routes between Ballymena and Glenarm in the centre of the Study Area and and over the hills between Larne and Carrickfergus in the south eastern part of the Study Area; the A2 scenic coastal drive which covers the entire coastal section of the Study Area as well as an upland section across the glens in the north;
- Residential properties and the rural road network in close proximity to the Development where viewers may either be static or obtain views for prolonged periods of time and where the Development may form a key element in these views;
- Areas of settlement where viewers may also be static and obtain views for long periods of time and where the landscape in proximity to the Development is likely to form a key element within the landscape setting for these settlements.

4.79 Using this search criteria, 58 PVPs were identified and analysed through the production of a preliminary ZTV diagram, preliminary wirelines and map-based research. These PVPs are listed in Table 4.4.1 below.

Initial site assessment and viewpoint 'shortlisting'

4.80 PVP locations where the initial wirelines indicated potential visibility were visited as part of an initial site assessment (PVP locations are indicated on Figure 4.3). Levels of actual visibility, the nature of visual receptors present at each location, and the overall viability of each viewpoint location were analysed (see Table 4.4.1 below). Where clearer views were identified in proximity to a PVP location these were also added to the list of PVPs. A 'shortlist' of 20 viewpoint locations was made which included a proportionate number of locations representing typical views of the Development, key visual receptors and key locations within the Study Area. For ease of analysis these shortlisted viewpoints were categorised as follows:

A. Views in close proximity to the site boundary;
B. Views on approaches to coastal settlements along roads within the Glens;
C. Views from the coastal settlement of Carnlough;
D. Views from the Antrim Glens;
E. Elevated views from the Antrim Plateau;
F. Views from the south western edge of the AONB and wider Study Area

4.81 A number of PVPs were not shortlisted because they were found to provide no actual view of the Development when visited as part of the on-site analysis. The reasons for this usually arose from differences between theoretical and actual visibility which is explained in Technical Appendix 4.2. Other PVPs were not shortlisted if a more typical/ representative view was demonstrated elsewhere, where no safe stopping place was possible to take a photograph or where the viewpoint location would not be easily accessible to the public. In all instances the clearest possible views of the Development were selected whilst taking into account the aforementioned considerations. It is noted that there is a distinct lack of visibility or clear visibility of the Development across much of the northern half of the AONB, the southern edge, along the coastline and beyond a radius of approximately 15 – 20 km. Therefore, the selection of Viewpoints is focussed on upland areas and Glens within a radius of approximately 10 km of the Development and some locations on more elevated parts of the Antrim Plateau within 10 – 15 km.

4.82 Wirelines and photomontages have been prepared to illustrate all shortlisted viewpoint locations. Where the proposed removal of forestry in proximity to proposed turbines 8 and 10 would be visible the estimated appearance of the landscape excluding this forestry is included in the photomontage and a baseline photograph showing the presence of this forestry as part of the current view is also presented for comparison.

Technical Appendix Table 4.4.1: Provisional Viewpoints and Proposed Shortlist

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Technical Appendix Table 4.4.1: Provisional Viewpoints and Proposed Viewpoint Shortlist

Provisional Viewpoint (shortlisted PVPs shown in bold)		Provis. Grid Ref.		Approx. dist. to nearest turbine (km)	Reason for provisional selection and shortlisting decision
		Easting	Northing		
PVP 1	**Doonan Leap Carpark, A42 Glencloy**	327232	414240	1.72 km to T5	**Shortlisted Viewpoint 3.** Used for initial iterative design development. Parking area on main road into Carnlough near historic fort (see Cultural Heritage chapter); in close proximity to site entrance and where turbines may be visible as a dominant feature; removal of existing vegetation and proposed replacement planting that will provide greater level of screening will be evident from this location.
PVP 2	**Ulster way at Crockandoo, Feystown Road**	330923	412340	5.84 km to T10	**Shortlisted Viewpoint 10.** Used for initial iterative design development. Elevated public road and footpath with views across Glenarm where Development is likely to be a prominent feature; panoramic views across landscape and seascape; presence of some residential properties along this part of road network.
PVP 3	**Dickeystown Road, Glenarm**	332169	414240	6.02 km to T1	**Shortlisted Viewpoint 4.** Used for initial iterative design development. Elevated descent into Glenarm from the east with several residential properties along road side obtaining similar views. Includes view across base of glen around setting of Glenarm castle; relatively close range view where Development is likely to be prominent; representation of coastal landscape character.
PVP 4	**Skerry East Road, Dungonnell Way**	318013	420604	8.24 km to T13	**Shortlisted Viewpoint 14.** Used for initial iterative design development. Located on Ulster Way / Dungonnell Way; in proximity to Cargan village in northern half of AONB; described online as being one of the most attractive roads in NI; elevated mid-range viewpoint looking south eastwards; presence of cumulative wind farms and single turbines at relatively close range to this location.
PVP 5	**Carnalbanagh Road between Broughshane and Slemish**	320316	406636	7.50 km to T11	**Shortlisted Viewpoint 19.** Used for initial iterative design development. Located on National Cycle Route and the edge of the AONB in proximity to larger settlements. Represents visibility of Development from lowland pastoral edge of the AONB; includes views of Rathsherry and Elginny Hill Wind Farms; attractive countryside and relatively well populated - rural dwellings scattered throughout the landscape in this part of Study Area.
PVP 6	**Glenview Road at junction with Deerpark and Starbog Roads, Glenarm**	328803	407214	6.83 km to T10	**Shortlisted Viewpoint 11.** Used for initial iterative design development. Mid range elevated view obtained when approaching AONB from south. Includes visibility of Development within wider context of the AONB - other upland parts of AONB will also be visible from this location; Slemish visible to south west; cumulative developments evident - several single turbines, Elginny Hill and Rathsherry wind farms are visible on approaches to this viewpoint.
PVP 7	**Harbour Park, Carnlough**	328668	417976	2.83 km to T1	**Shortlisted Viewpoint 7.** Represents views from coastal village of Carnlough which is the closest settlement to the Development; elevated viewpoint in public open space overlooking the coast and the village's main street which residents and tourists are likely to visit for visual amenity purposes as outdoor recreation.
PVP 8	Glenarm village at harbour	331375	415600	4.93 km to T1	Initially selected to ascertain nature of views from coastal settlement but wireline and site survey both revealed no views of the Development
PVP 9	**Straidkilly Road - Ballyvaddy Road junction, Carnlough**	329360	416394	2.87 km to T1	**Shortlisted Viewpoint 6.** Represents views from scenic A2 Coast Road at entrance to coastal village of Carnlough, which is the closest settlement to the Development; views would be experienced by road users on scenic driving route, residents of properties in proximity to this location and visitors to the adjacent beach.
PVP 10	Garron Point	330225	423840	8.36 km to T2	Initially selected to ascertain nature of views from car park and popular coastal amenity spot next to scenic driving route on the A2 Coast Road; wireline and site survey both revealed no views of the Development
PVP 11	Parking area between Garron Point & Carnlough	329731	421662	6.25 km to T2	as above

PVP 12	**Ballyvaddy Road to east of Development**	328274	414833	2.33 km to T1	**Shortlisted Viewpoint 9.** Selected to represent views from roads overlooking the southern side of Glencloy which include rural residential properties along much of their length. This location is on the central section of road where there are clear views across farmland in the base of the glen towards the uplands on which the Development would be located. Site survey revealed that the upper section of road between this point and PVP 34 would have views that are frequently more enclosed by foreground topography but there are some properties occupying elevated positions above the road corridor that may experience clear views of a similar nature to those obtained at this location.
PVP 13	South western section of Slane Road	325446	412087	0.93 km to T10	Initially selected to illustrate views from public road in closest proximity to the Development. This end of the road has the most residential properties and a preliminary wirelines indicated partial views of some turbines. However, site survey found that views would be largely screened by vegetation and foreground topography.
14	**Middle section of Slane Road**	325883	412518	0.88 km to T10	**Shortlisted Viewpoint 1.** Selected for the same reasons as above. This central section of the road has no residential properties but would have clear uninterrupted views of the Development on one side of the road, and extensive views across other parts of the Antrim Plateau on the other side, including views towards Slemish; cumulative effects with Carnalbanagh and Ballygilbert wind farms which would be elements of the wider view.
15	**North eastern section of Slane Road**	326400	412950	1.28 km T10	**Shortlisted Viewpoint 2.** Although not representing the most extensive view of the Development from the 3 provisional Slane Road locations this Viewpoint would be in closest proximity to the Development and represents views from residential properties clustered at this end of the road corridor. Site survey revealed that views beyond this point are largely contained by tall hedges which prevent views in the direction of Development. However, some residential properties are located in elevated positions above the road corridor and may achieve clearer views.
16	Killycarn Road to south west of Development	323108	411720	1.86 km to T11	Initially selected to represent views from residential properties on a rural road in close proximity to the Development and in proximity to a cultural heritage site; the provisional wireline demonstrated only partial views of some blade tips and site assessment revealed a high level of screening from foreground vegetation. Killycarn Road also doesn't appear to be a through road and this viewpoint would be located at the top end of the road and is unlikely to be visited by a large number of visual receptors.
17	Kilnacolpagh Road near Carnalbanagh	326058	409347	3.73 km to T10	Initially selected for its location on the cycle network but site assessment found PVPs 6 and 34, located to either side of this location, had clearer views as did PVP 43 which was more elevated.
18	Skerry Church near Broughshane	318981	408933	6.83 km to T11	Initially selected as a potential visitor attraction - ruined church thought to have been established by St Patrick; however, site visit found that church is not clearly evident or signposted and road corridor is generally heavily vegetated with heavily restricted views. Houses on elevated ground adjacent to road corridor may experience clearer views but there are no publicly accessible viewpoints that represented this. Furthermore, the Development would be located to the far LHS of the main focus of views from this road and would be partially obscured by preceding uplands.
19	**Slemish summit**	322201	405386	7.86 km to T11	**Shortlisted Viewpoint 15**. Visitor attraction/ destination, cultural heritage feature and prominent landmark. Initial PVP considered views from carpark & visitors centre from where views would also be obtained (grid ref. 321681; 405777); Views from this location would be panoramic and representative of the Development within the context of much of the Antrim Plateau and the wider landscape to the west; visibility of a number of cumulative wind farms and single turbines
20	B94 near Broughshane	316881	404638	11.27 km to T11	Initially selected to represent views from pastoral landscape surrounding Ballymena in the western part of the Study Area but site survey revealed that views would be heavily restricted by tree and hedgerow cover.
21	St Patrick's Church, Crebilly	314003	402960	14.49 km to T11	Initially selected because this is a community amenity occupying an elevated position overlooking Ballymena and the AONB. However, the road corridor is typically heavily vegetated and from this location views in direction of the Development are screened by this vegetation and the church boundary pillars. Access to the church car park was not possible as the gates were locked.

22	Gracehill near Ballymena	306574	401860	21.09 km to T11	Initially selected to represent longer range views towards the Development from the western part of the Study Area and the outskirts of Ballymena. However, site survey revealed that built elements and vegetation in the foreground and middle distance were likely to be dominant features and the Development was unlikely to be easily perceptible.
23	A42 between Ahoghill and Portglenone	303069	401004	24.55 km to T11	as above
24	B93 between Randalstown & Ahoghill	305952	396787	24.60 km to T11	as above
25	Viewing point in Ballyboley Forest	331582	398271	16.03 km to T10	Initially selected because this location is within the ZTV and there is a parking area and marked viewing point on the Ulster Way in far south of Study Area/ AONB. However, the wireline illustrates very limited views.
26	Ulster way at base of Agnew's Hill, Starbog Road	333438	402621	13.24 km to T10	Initially selected to represent mid-range views from the Development from the southern part of the AONB and Study Area on the route of the Ulster Way. However, the wireline illustrated very limited visibility of only 2 turbine tips which were unlikely to be easily perceptible on site.
27	Ulster way between Agnew's Hill and Sallagh Braes	333960	403404	12.98 km to T10	Initially selected for the same reasons as above but wireline indicated no view of the Development.
28	Ulster way at start of Sallagh Braes walk	334093	404177	12.51 km to T10	as above
29	Ulster way overlooking Sallagh Braes	334247	404953	12.10 km to T10	as above
30	**Ulster Way at Knockdhu**	333629	406800	10.45 km to T10	**Shortlisted Viewpoint 18.** Represents clear views from an elevated section of the Ulster Way that is easily accessible from the Linford carpark on Feystown Road; from this location there are panoramic views incorporating Slemish, Glenarm, Ballygally and the series of hills between Sallagh Braes and Scawt Hill so it illustrates the position of the Development in the wider context of the AONB and also its relationship to a number of cumulative wind farms also present in the view.
31	Brustin Brae at Knowehead overlooking Ballygalley and Scawt Hill	337249	405663	14.10 km to T10	Initially selected to ascertain nature of views from approach roads to south east between Larne and Ballygally in context of the coast but wireline revealed no views of the Development.
32	**Ulster Way at Scawt Hill**	333674	408991	9.37 km to T10	**Shortlisted Viewpoint 17.** Selected to represent sequential views from the Ulster Way which traverses the section of the Antrim Plateau overlooking the coastline between Ballygally and Glenarm when viewed in conjunction with PVP 30, Knockdhu.
33	Church at Feystown	331585	410026	7.04 km to T10	Initially selected for similar reasons to PVP 2; not selected in favour of the latter because this location provides a slightly oblique view where the Development would not appear within the main direction/ focus of views from this location and where elements of the foreground landscape are more prominent. However, it's noted that this location is analysed and illustrated in the Cultural Heritage chapter.
34	**Munie Road**	327166	411151	2.73 km to T10	**Shortlisted Viewpoint 12.** Represents clear views in the direction of the Development from the rural road network and residential properties located alongside it; Elginny & Rathsherry wind farms also present in view.
35	**Lane from Carnlough to Cranny Falls**	328229	418176	2.65 km to T1	**Shortlisted Viewpoint 8.** Represents views from a number of visual receptors within Carnlough village not associated with the coastline, including residents of properties backing onto this lane, walkers, users of carpark and play area at start of footpath. Path leads to viewing point at disused Gortin Quarry from where there are extensive views across Carnlough Bay. Caravan park located to the north east of this location would experience similar views (see PVP 51) and also a number of sequential viewpoints along the A42 on the outskirts of the town (see PVPs 52 - 57).
36	Further along route to Cranny Falls	327393	418517	2.34 km to T2	Initially selected for similar reasons to PVP 35 but wireline revealed extremely limited visibility (only 1 blade tip) so PVP 35 selected instead.
37	Lane above Cranny Falls	327109	418811	2.47 km to T2	Initially selected for similar reasons to PVP 35 but likely to be a smaller range of potential visual receptors present at this location so PVP 35 selected instead.
38	Glenariff Forest Park	319848	418467	5.49 km to T13	Initially selected to represent views from a popular tourist destination in close proximity to the Development but wireline illustrated that views would typically be screened by intervening high ground around Collin Top and Berry Hill.
39	**Moyle Way near Trostan summit**	317534	423016	10.20 km to T13	**Shortlisted Viewpoint 13.** Selected to represent views from the highest summit in the Glens of Antrim which is accessible via a footpath; likely to illustrate the Development in the context of the wider AONB with panoramic views in most directions.

40	A42 near Ballypatrick Forest	321031	434723	18.89 km to T2	Initial ZTV suggested potential long range views from high ground in this northern part of the Study Area. This location is also on the Causeway Coast and Glens scenic driving route and would therefore include potentially sensitive visual receptors. However, the wireline revealed relatively limited and partial visibility of the Development that would be better represented by PVP 4 which is located at closer range.
41	**Glenbuck**	301252	415544	23.13 km to T13	**Shortlisted Viewpoint 20.** One of the few areas in the western side of the Study Area, outwith the AONB, with theoretical views of the Development; in proximity to an existing cluster of wind farms on Long Mountain ridge and other clusters of wind farms on the western edge of the AONB also present in middle ground; located beyond 20 km so included as a wireline-only illustration.
42	Dungonnell Way in closer proximity to Cargan	315714	418694	9.28 km to T13	Initially selected for same reasons as PVP 4 because it is in closer proximity to a rural settlement and main road network and therefore likely to represent a greater range of visual receptors; not selected because wireline indicated very limited views of only one blade tip which is unlikely to be easily discernible.
43	**Carnalbanagh**	325885	409079	3.89 km to T10	**Shortlisted Viewpoint 16.** Extensive view from uplands in north west with Slemish and surrounding countryside in foreground; Existing and consented cumulative wind farms and several single turbines also present in same view to illustrate cumulative effects.
44	**A42 near Carnlough**	327116	413270	2.01 km to T10	**Shortlisted Viewpoint 5.** Main road approaching Carnlough and providing much clearer/ more elevated view of Development than PVP 1, Doonan Leap; Representative of typical views along this part of A42 and from properties adjacent to road corridor from a safe stopping place.
45	Woodside Road, Broughshane	313842	403908	13.98 km to T11	Initially selected to represent views from urban edges of Ballymena and Broughshane. Wireline illustrated distant views of upper parts of the majority of the 14 proposed turbines but site survey revealed that views in the direction of the Antrim Plateau would typically be screened by built development in the foreground and middle distance.
46	Appalachian International Trail at Feystown Road crossing	331157	414075	5.15 km to T1	Initially selected during site assessment to represent sequential views of Development in conjunction with other PVPs along Feystown Road on descent into Glenarm. Although this location provides a clear view it was not selected because clearer views which would be experienced for a longer section of the Feystown Road are better represented by PVP 2. PVPs 3 and 12 also represent typical views in this part of the Study Area.
47	Springhill Road - Dickeystown Road junction, Glenarm	331417	414755	5.15 km to T1	As above; location illustrates further decline in visibility as road descends into Glenarm and was not selected for this reason.
48	A42 near Slane Road and Lisles Hill	324909	411207	1.71 km to T11	Initially selected to assess potential visibility from main road network in close proximity to site boundary but wireline indicates limited visibility. Not selected in favour of PVP locations on Slane Road where clearer views are obtained.
49	Buckna Road, Broughshane	317746	407061	8.96 km to T11	Initially selected to represent views from well-populated rural road network in pastoral landscape on outskirts of Broughshane village; part of cycle network and in close proximity to Slemish; alternative location to PVP 5 but the latter has clearer views. Site assessment revealed that views from this location are more typically obscured by foreground vegetation and the Development would also be substantially less prominent than Rathsherry and Elginny Hill wind farms which are prominent features at this location.
50	St Mary's Church of Ireland on Largy Road, Carnlough	329045	419466	4.10 km to T1	Initially selected for its elevated position at a community amenity (church) on the outskirts of village overlooking coast and uplands. Not shortlisted in favour of PVPs 7 and 35 which offer similar views in terms of extent of visibility, foreground setting and types of receptors. However, it's noted that this location is analysed and illustrated in the Cultural Heritage chapter.
51	Whitehill Caravan Park, Carnlough	328226	417844	2.35 km to T1	Selected as a location for potentially sensitive visual receptors; not shortlisted in favour of PVP 35 which offers clearer views due it's slightly higher elevation.

52	Outskirts of Carnlough on A42 Ballymena Road	328541	416655	2.09 km to T1	Series of locations selected to identify sequential nature of views and a range of visual receptors located along A42 when travelling towards Carnlough village from the Development and vice versa. Extent of views from PVPs 52, 53 and 55 are broadly similar to PVP 35 but from a busy road corridor where safe stopping places are often more difficult to find and also where views are frequently screened by foreground buildings and vegetation. PVP 35 has been shortlisted (as Viewpoint 8) because it offers a safe place to take a representative photograph and represents a broader range of visual receptors. PVP 7 (shortlisted Viewpoint 7) also represents views from Carnlough. However, the detailed descriptions of VPs 7 and 8 includes consideration of views from PVPs 50 - 53 and PVP 55 also.
53	Hillview Park residential street adjacent to A42, Carnlough	328418	416405	1.93 km to T1	as above
54	Ballymena Road, A42 near proposed site entrance	327246	414549	1.50 km to T5	Initially selected to illustrate potential views from A42 at proposed site entrance where earthworks and removal of existing planting would be visible. Whilst view from this point on the A42 would be clearer than that illustrated by PVP 1 it would be relatively momentary and on a fast moving section of road. Not selected because it is not representative of views from this part of the A42 but it is considered in the detailed analysis of shortlisted Viewpoints in Category B
55	Caravan Park off A42, edge of Carnlough	328468	416499	1.99 km to T1	as per PVP 52
56	A42 near Galdanagh Road junction	327768	415649	1.41 km to T1	Initially selected to illustrate sequential views between the proposed site entrance and outskirts of Carnlough. Not selected for further analysis because they were found to be relatively momentary and on a fast-moving section of road. The extent of views of the Development would also less than those represented by PVP 44 (shortlisted VP 5).
57	A42 at Galdanagh Road junction	327891	415810	1.47 km to T1	
58	Promontory Fort at Lurigethan	322721	425611	9.70km to T2	Initially selected because Lurig summit is noted as a key element of physical landscape character within the same part of the AONB as the Development. Not selected because wireline illustrates a similar but slightly lesser extent of visibility to PVP 4 (selected as Viewpoint 14) and in a less accessible location.

Final Viewpoint Selection

4.83 A total of 20 final Viewpoints have been selected for consideration in this LVIA. Detailed descriptions of the final Viewpoints are an integral part of the Visual Impact Assessment section of the LVIA (Chapter 4 starting at paragraph 4.134). Their locations are indicated on all map-based Figures (Figures 4.1 – 4.10) and visualisations to accompany the detailed written analysis of these Viewpoints are provided in Figures 4.11 – 4.30.

4.84 The baseline assessment, including the viewpoint selection process, identified a number of key visual receptors including; residents of rural properties and settlements located in close proximity to the Development but also elsewhere in the Study Area; tourists on scenic routes, footpaths and cycle routes throughout the Study Area; receptors located within the AONB with views ranging from close range to those located at greater distances with an appreciation of the wider landscape setting and visibility of the Development in the context of this setting. Planning policy guidance recognises that wind farms will, by their nature, often be clearly visible from close range viewpoints but that this will not necessarily equate to adverse visual effects. Therefore, the final Viewpoints presented in this LVIA are intended to represent typical views of the Development that are likely to be obtained in different parts of the Study Area, from key locations and by key visual receptors. They have been grouped into categories so that the different types of views, receptors, and specific areas they represent can be accurately described and understood without unnecessary repetition. A complete list of the final Viewpoints and categories are provided in Table 4.4.2 below. Detailed descriptions of these Viewpoints are provided in the LVIA, Chapter 4 starting at paragraph 4.147.

Technical Appendix Table 4.4.2: Final Viewpoints

Final Viewpoint no. and location		PVP number	Final Grid Reference
Category A: Views in close proximity to the site boundary			
1	Middle section of Slane Road	p14	325960; 412532
2	North eastern section of Slane Road	p15	326476; 412961
3	Doonan Leap Carpark, A42 Glencloy	p1	327309; 414256
Category B: Views on approaches to coastal settlements			
4	Dickeystown Road, Glenarm	p3	332246; 414491
5	Approach into Carnlough on A42	p44	327190; 413285
Category C: Views from the coastal settlement of Carnlough			
6	Straidkilly Road, Carnlough	p9	329355; 416434
7	Harbour Park, Carnlough	p7	328740; 417989

Final Viewpoint no. and location		PVP number	Final Grid Reference
8	Lane to Cranny Falls, Carnlough	p35	328316; 418191
Category D: Views from the Antrim Glens			
9	Ballyvaddy Road overlooking Glencloy	p12	328347; 414844
10	Ulster Way at Crockandoo, Feystown Road	p2	331001; 412343
11	Glenview Road, Glenarm	p6	328879; 407223
12	Munie Road	p34	327241; 411163
Category E: Elevated views from the Antrim Plateau			
13	Moyle Way near Trostan summit	p39	317771; 423093
14	Skerry East Road, Dungonnell Way	p4	317933; 420591
15	Slemish summit	p19	322201; 405386
16	Carnalbanagh	p43	325950; 409158
17	Ulster way at Scawt Hill	p32	333674; 408991
18	Ulster way at Knockdhu	p30	333629; 406800
Category F: Views from the south-western edge of the AONB and wider Study Area			
19	Carnalbanagh Road near Broughshane	PVP 5	320392; 406645
20	Glenbuck Road, Long Mountain Ridge	PVP 41	301252; 415544

Technical Appendix 4.5: Cumulative Baseline

4.85 This Technical Appendix provides details of the wind farms that are considered to form the 'Cumulative Baseline' for this LVIA as described in the LVIA, Chapter 4 starting at paragraph 4.210. The Cumulative Baseline refers to all existing, consented and proposed wind farms within the 30 km Study Area. There are a total of 22 wind farms considered to be part of the Cumulative Baseline for this LVIA, of which 16 are existing and account for a total of 99 turbines. A further 3 are consented and account for 13 turbines. A further 3 are proposed and account for 25 turbines. There are also 4 existing or consented single turbines located within 5 km of the Development which have also been included in the Cumulative Baseline. There are a total of 116 existing and consented turbines in the Study Area.

Technical Appendix Table.4.5.1 Wind Farms included in the Cumulative Baseline

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Technical Appendix Table.4.5.1 Wind Farms included in the Cumulative Baseline

Name of wind farm	Status	Approx. distance from Development (km)*	No. of turbines	Rotor dia. (m)	Hub height (m)	Blade tip height (m)	Visible from which shortlisted Viewpoints		Additional notes
Wind Farms within 30 km Study Area									
Altaveedan	Ex	17.18 km to NW of T13	9	80	60	100	20	1 no.	
Ballygilbert	Prop	7.43 km to SE of T10	14	117	91.5	150	2, 8, 10, 12, 13, 15, 17, 18, 19, 20	10 no.	
Ballykeel	Cons	12.95 km to SE of T10	7	71	64	99.5	1,13, 15, 20	4 no.	
Ballymena Wind Park	Ex	13.10 km to SW of T11	2	82	78	119	15, 16, 20	3 no.	
Carn Hill	Ex	26.00 km to S of T10	6	82.4	60	101.2	13	1 no.	
Carnalbanagh	Prop	4.08 km to S of T11	7	90	80	125	1, 2, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20	12 no.	
Castlegore	Cons	15.93 km to S of T11	4	100	75	125	13, 20	2 no.	
Connaught Road	Ex	24.45 km to SW of T11	2	26	44	57	15	1 no.	
Corby Knowe	Ex	20.46 km to SW of T11	3	80	59.5	99.5	13, 20	2 no.	
Corkey	Ex	14.30 km to NW of T13	10	37	35	53.5	13	1 no.	
Corkey Extension	Ex	16.32 km to NW of T13	1	37	35	53.5	13	1 no.	*Assumed dimensions - exact are currently unknown*
Craigs & Ext.	Cons	23.39 km to W of T11	2	93	80	126.5	13, 15, 16, 17, 18, 19, 20	7 no.	
Elginny Hill	Ex	10.22 km to SW of T11	10	71	64	91.5	10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	11 no.	
Elliot's Hill	Ex	15.93 km to SW of T11	10	39	39	58.5	13, 20	2 no.	
Garves	Ex	24.5 km to W of T13	5	90	80	125	13, 15, 20	3 no.	
Glenbuck 1	Ex	23.45 km to W of T13	1	90	75	120	13, 15, 16, 17, 18, 20	6 no.	
Glenbuck 2	UC	23.14 km to W of T13	4	70	65	100.5	13, 15, 16, 17, 18, 20	6 no.	
Gruig	Ex	13.12 km to NW of T13	10	80	60	100	13, 20	2 no.	
Long Mountain	Ex	22.79 km to W of T14	12	71	65	100.5	13, 15, 16, 17, 18, 20	6 no.	
Rathsherry	Ex	8.41 km to SW of T11	9	90	60	105	10, 11, 12, 14, 15, 16, 17, 18, 19, 20	10 no.	
Whappstown	Prop	15.67 km to S of T11	4	71	85	120.5	13, 20	2 no.	
Wolf Bog	Ex	15.93 km to SW of T11	5	80	60	100	13	1 no.	
Single turbines within approx. 5 km of the Development (existing & consented)									
ST 1	Cons	1.47 km to SW of T11	1	31	40	55.5	16, 17, 19	3 no.	Planning ref: G/2013/0377/F; 360m NE of 246 Carnlough Rd, Broughshane; *Approx. grid ref. 324007; 411523 based on Google Maps + planning app. map combined*
ST 2	Cons	2.79 km to SE of T10	1	13.1	20	26.55	2, 8, 10, 11, 12, 16, 15, 18	8 no.	Planning ref: F/2012/0184/F; 95m NW of 84 Ballyvaddy Rd; *Approx. grid ref 327721; 411784 based on Google Maps + planning app. map combined*
ST 3	Ex	3.25 km to SE of T10	1	33	30	46.5	1, 2, 10, 11, 12, 15, 17, 18	8 no.	Planning ref: LA02/ 2021/ 0604/F & F/2011/0073/F; Approx. 563m South of 68 Ballyvaddy Road Carnlough; *Approx. grid ref. 328340; 412213 based on Google Maps + planning app. map combined*
ST 4	Ex	3.11 km to SE of T11	1	33	30	46.5	1, 2, 8, 10, 11, 16, 15, 17, 18	9 no.	Planning ref: LA02/ 2021/ 0606/F & F/2013/ 0164/F; Approx. 553m South of 68 Ballyvaddy Road Carnlough; *Approx. grid ref. 328198; 412202 based on Google Maps + planning app. map combined*

** Distance is measured between nearest turbines unless otherwise stated*

Total no. within the Study Area:			
Existing Wind Farms:	16	Existing Turbines:	99
Consented Wind Farms:	3	Consented Turbines:	13
Existing and Consented Single Turbines	4	Single Turbines, 5km:	4
Sub total	*23*		*116*
Proposed Wind Farms:	3	Proposed Turbines:	25
Total no. wind farms & single turbines	*26*	*Total no. of wind turbines:*	*141*