Stubsgill Wind Turbine Repowering

Landscape and Visual Appraisal

Prepared for

CONSTANTINE WIND ENERGY

CWE Vestas Limited

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1.0 INTRODUCTION

1.1 Introduction

1.1.1 Axis has been appointed to undertake a Landscape and Visual Appraisal (LVA) for the proposed repowering of an existing wind turbine ('the Proposed Development').

1.1.2 The Proposed Development is located in West Cumbria, within the borough of Copeland. It is located 3.4km south-east of the town of Workington.

1.1.3 This standalone LVA report appraises the effects of the Proposed Development upon landscape character and visual amenity.

1.2 The Proposed Development

1.2.1 The Proposed Development is described in detail in the Planning Statement and illustrated on the Planning Drawings. In summary the Proposed Development would comprise the repowering, or replacement, of an existing wind turbine which has a hub height of 30 metres and a blade tip height of 45.5m, with a new turbine of hub 50m and a blade tip height of 76m. For context, the existing turbine was consented in 2013 (application ref: 4/13/2157/OF1).

1.2.2 For context, the existing turbine was approved (Ref: 4/13/2173/OF1) in 2013.

2.0 LEGISLATION AND POLICY CONTEXT

2.1 Legislation, Policy and Guidance

2.1.1 Details of the planning and policy background for the proposal, including an appraisal of effects on relevant landscape-related policies, as set out in the adopted Statutory Development Plan, are included in the Planning Statement. Key legislation and policies relevant to the LVA are summarised below.

2.2 European Landscape Convention

2.2.1 The UK Government is a signatory of the European Landscape Convention (ELC), which became binding in March 2007. The Convention is aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape. It relates chiefly to public bodies and to the policies, plans and programmes produced by these.

2.2.2 This LVIA is a development specific process which accords with Article 6C of the ELC. This LVIA is informed by extant Landscape Character Assessment studies (described in Section 3.0 below), which more directly relate to the provisions of Article 6C.

2.3 National Planning Policy

2.3.1 National planning policy relevant to the potential landscape and visual effects of the proposed scheme is found within the National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, revised December 2023).

2.3.2 The NPPF sets out the Government's planning objectives to contribute to and enhance the natural and local environment by "*protecting and enhancing valued landscapes*" (Para.180 (a) Page 52). It also states the importance of *"recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services"* (Para. 180 (b) Page 52) Additionally, in planning decisions, "*Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues*" (Para. 182, Page 52).

2.4 Local Planning Policies and Supplementary Planning Guidance

2.4.1 The Local Planning Authority is Copeland Borough Council. As such the relevant plan is the Copeland Local Plan (Copeland Borough Council, 2013).

2.4.2 The following policies of relevance are:

Policy ENV5 – Protecting and Enhancing the Borough's Landscapes

7.6.2: *"The issue of landscape protection in the Borough is complex. Much of Copeland is, of course, within the Lake District National Park. There were a number of areas designated in the Copeland Local Plan 2001-16 as Landscapes of County Importance and the only other heritage landscape designation is the St Bees Heritage Coast (a national designation). The approach to landscapes outside nationally protected areas is changing. The emphasis is now on Landscape Character Assessment and protecting landscapes through sensitive development management based on the Assessment, rather than rigid designations*.

7.6.3: *Cumbria County Council undertook a Historic Landscape Characterisation Programme (published in 2009) and also published a Landscape Character Assessment Guidance and Toolkit in 2011 to help planners and developers protect the intrinsic qualities of the county's landscape assets. Pending a more detailed Assessment, to be undertaken for the Copeland plan area, the Council will continue to use the Landscapes of County Importance designation in development management decisions. It is expected that this work will be completed in time for the characterisation to be depicted on the Proposals Map, when the map is revised following adoption of the Site Allocation and Policies Plan."*

Policy CC2PU: Wind Energy Developments

2.4.3 Copeland Borough Council have published the *Copeland Wind Energy Technical Document, 2022* which is referred to in Policy CC2PU of the Copeland Borough Council Local Plan (2021-2038). The following is relevant to the Proposed Development:

"Wind turbines 50m in height or over must be located in an Area Suitable for Wind Energy as shown on the Local Plan Proposals Map, unless the proposal is for the repowering of existing turbines or windfarms or is for a proposal to extend the life of an existing turbine."

2.4.4 The consideration of landscape sensitivity to wind turbine development within the study area is considered further as part of the appraisal of landscape effects, with particular focus on the host Landscape Character Type; 9ii: Moorland Hills and Low Plateaus, which identified as having Moderate capacity for wind developments.

3.0 METHODOLOGY AND GUIDANCE

3.1 Guidance

3.1.1 The method of appraisal is based on the principles established in the best practice guidance, the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3). GLVIA3 states that any assessment of effects should be tailored to the specific nature and likely potential effects of the development proposed.

3.1.2 This LVA has followed a methodology which has been developed using the published good practice guidelines set out in the GLVIA3. A detailed methodology followed in undertaking this LVA is set out in **Appendix A.**

3.1.3 This LVA also follows the Landscape Institute's guidance regarding the production of visualisations TGN 06/19. A methodology describing how visualisations have been produced is set out in **Appendix B.**

3.2 Scope of the Appraisal

3.2.1 This appraisal considers the likely landscape and visual effects of the Proposed Development. The appraisal focuses on landscape character (the effect on the landscape resource) and visual amenity (the visual effect on people's views). Given the rural nature of the site, townscape effects are scoped out of this appraisal.

3.2.2 The appraisal focuses on the operational phase effects of the Proposed Development with only brief consideration of effects during construction. The appraisal focuses on effects of the Proposed Development immediately after completion of construction and the medium to long term effects of the Proposed Development when fully operational.

3.2.3 The appraisal acknowledges the contribution of heritage features to the landscape and visual baseline but excludes specific appraisal of any effect on the setting of the cultural heritage assets, which are properly dealt with by cultural heritage specialists.

3.3 Study Area

3.3.1 The Study Area for the LVIA has been determined by the computer-generated Zone of Theoretical Visibility (ZTV) for the Proposed Development, as presented on **Figures 2.1** and **2.2**. The ZTV extends for a 25km distance from the Proposed

Development. Reference was made to relevant NatureScot guidance[1], the most widely referenced guidance in the UK on the visual representation of wind farms, which recommends a 25km initial ZTV radius for turbines with a blade tip height of between 71m and 85m. The Proposed Development comprises a 76m high turbine and therefore an initial Study Area of 25km will be considered.

3.3.2 The 25km Study Area captures most areas that fall within the ZTV of the proposed scheme as shown on **Figure 2.1**. Outside of this Study Area, whilst visibility is theoretically possible over longer distances, the level of visual effect will diminish with distance and is unlikely to be considered material to the decision maker.

3.3.3 Referring to **Figure 2.1**, the inland ZTV coverage is largely confined to an approximate 10km radius from the Site. Given that the Proposed Development comprises a single turbine and it would form the replacement of an operational turbine at the Site, a maximum 10km Study Area will be used as a basis for assessing landscape and visual effects. This has been verified in site and desk studies. However, this focus has not precluded consideration of locations outside 10km. The focused 10km study area is shown on **Figure 2.2**.

3.3.4 Operational wind turbines within the study area form part of the LVA baseline and their presence is taken into account in any conclusions made.

3.4 Appraisal Criteria

3.4.1 Having applied professional judgement to assess the sensitivity of the baseline landscape and visual environment and to consider the magnitude of potential change that the Proposed Development would cause. These are then combined using further professional judgement to consider the level of effect.

3.4.2 An LVA is not typically produced as part of an Environmental Impact Assessment (EIA) process and therefore it is not necessary to identify "significant effects." It is however still appropriate to draw attention to any changes to landscape character or visual amenity which may be of particular note to the determining authority when considering the acceptability of a proposal. This approach is supported by GLVIA3 and subsequent clarifications provided by the Landscape Institute.

[1] *NatureScot (formerly Scottish Natural Heritage) (2017) Visual Representation of Wind Farms: Guidance*

3.4.3 The level of effect can only be defined in relation to each particular development and its specific location. It is for each LVA to determine how judgements about receptor sensitivity and the magnitude of effect should be combined to derive the level of effect and to clearly explain how this judgement has been made.

3.4.4 Refer to **Appendix A** which provides further explanation as to how sensitivity and magnitude are combined to identify the level of effect upon a receptor.

3.5 Limitations

3.5.1 There were no notable limitations to the production of this LVA.

3.5.2 The photography was undertaken at the end of winter when weather and light conditions are less favourable than summer months. This is sometimes evident in photography at viewpoints. However, the advantage of surveying during winter months is that trees have shed their leaves and this results in greater visibility across the landscape and a reasonable 'worst-case' appraisal of effects can be undertaken.

3.6 Data Collection

3.6.1 Baseline data for this LVA has been gathered by both desk- and field-based surveys. These have included reviews of extant landscape character assessment studies (see below) and field visits in February and March 2024 to gain an understanding of the landscape and visual context of the Site and to take photographs.

3.7 Zone of Theoretical Visibility (ZTV)

3.7.1 ZTV mapping has been used to help identify the extent of expected visibility of the Proposed Development.

3.7.2 The ZTV was produced using a Digital Terrain Model (DTM), OS Terrain 50 which is supplied by DEFRA. This is derived from terrain information and excludes surface screening features such as buildings and vegetation.

3.7.3 This data source gives a theoretical worst case analysis of visibility of the Proposed Development as it is based on landform alone and not surface screening features. However, it should be noted that any ZTV analysis should be seen as a tool which aids desk and site studies rather than being an absolute indicator of visibility and the assessor has verified the ZTV on site.

3.7.4 The ZTV shown on **Figure 2.1 and 2.2** reflects the theoretical visibility of the Proposed Development using the maximum tip height of the proposed turbine, which is 76m and a maximum hub height of 50m. The ZTV on **Figure 2.3** illustrates a comparison between the theoretical visibility of the operational turbine, based on a 45.5m tip height, compared to the tip height of the proposed turbine, 76m.

3.8 Visualisations

3.8.1 The methodology for the production of visualisations in presented in **Appendix B**.

3.9 Site Visit

3.9.1 Site visits were carried out in February and March 2024.

3.9.2 During the site visits, viewpoint photography was captured and the assessor gained familiarity with the wider Study Area by walking along public footpaths, across open access land, and by walking and driving along lanes and roads.

Viewpoint locations were refined during the site visit to avoid localised screening and to select camera positions to illustrate the most representative views.

4.0 BASELINE

4.1 Data Collection

4.1.1 Baseline data for the LVA has been gathered by both desk and field based surveys. This includes a review of landscape character assessment studies (see below), and field visits to gain an understanding of the landscape and visual context of the Sites.

4.2 The Site and its Surroundings

4.2.1 The Site is located close to the Cumbrian coastline, 1.1km east of the village of Distington, and 1km west of the village of Gilgarran. The Site is situated at 99m AOD and consists of a small to medium sized agricultural field bound by hedgerows with an access track leading to a single existing turbine with a hub height of 30m and a 45.5m tip height. The operational turbine is situated on a small foundation pad and hardstanding. The Site is not crossed by any Public Rights of Way (PRoW).

The wider landscape consists of undulating fields punctuated by woodland and scattered farmsteads. The A595 is a main road is located 1.5km to the west and it comprises a main north-south orientated road. The relatively expansive Lillyhall industrial site is located 0.9km north-west from the Site. Other notable features include ancient woodland to the south-east, a large nursery located 0.6km to the east and Distington Hall Crematorium and Walled Garden which lies 0.5km to the north.

4.3 Landscape Designations

Statutory Landscape Designations

4.3.1 The Site is not covered by any landscape designations.

4.3.2 The Study Area includes the western extent of the Lake District National Park, the boundary of which is approximately 7km east, south-east of the site and will therefore be considered further in this appraisal.

4.4 Landscape Character Assessment

National

4.4.1 At a national level, 159 National Character Areas (NCA) have been identified by the former Countryside Commission (now Natural England). Details of each NCA are available via the Natural England website[2].

4.4.2 NCAs provide background and context to more detailed landscape character assessments produced at county and district levels. Their broad geographic reach means that the key characteristics identified as typical of a particular NCA may not necessarily apply to a specific location within that NCA.

4.4.3 The Proposed Development is located within NCA7: West Cumbria Coastal Plain, the key characteristics of which are:

"The NCA consists of an undulating coastal landscape of varying width with open views to the Cumbria High Fells NCA and across the Irish Sea to Galloway and the Isle of Man.

The area has a diverse, open coastline ranging from depositional sand, shingle and pebble beaches and sand dunes, through low soft cliffs of glacial or industrial origin, to high sandstone cliffs with a rich and varied flora and fauna, including dune grasslands, seabird colonies and the natterjack toad.

There are lowland river valleys with limited ancient semi-natural woodland, and expansive estuarine landscapes with lowland raised mires, salt marshes, mudflats and intertidal habitats with large numbers of wintering waders and wildfowl.

Important areas of brownfield biodiversity, often in urban-fringe locations, are characterised by rare plants, reptiles and invertebrates including the small blue butterfly.

The area includes open pastoral farmland with occasional woodlands, basin and valley fens, remnant semi-natural grasslands/meadows associated with streamsides, low-lying land, and localised pockets of arable land supporting species such as curlew and wintering hen harrier.

[2] Natural England, 2014. *National Character Area profiles.* [online] <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles> [accessed 18 Oct 2023]

There are areas of ancient enclosure with medium to large rectilinear fields and few hedgerow trees. They are bounded by hedges (often gappy and augmented by wire fences), stonewalls on higher ground, and stone-faced earthbanks locally known as 'kests' along the coast.

There is limited tree cover, with most woodland to be found on steeper slopes and along river corridors. There are some plantation woodlands and shelterbelts associated with the upland margins of the area and former open cast mining sites.

There is a dispersed rural settlement pattern of hamlets and isolated farmsteads with some villages.

Distinctive building materials are a combination of locally quarried red sandstone, red brick and render augmented by coastal pebbles along the southern coast.

Larger urban settlements and coastal towns are closely linked with the growth and location of the area's strong industrial history of coal and iron ore mining, processing ore, smelting and ship-building.

Extensive urban-fringe influence is linked to highly visible industrial past and present, including quarrying, open cast mining, restoration and reclamation initiatives, manufacturing and processing plants and the nuclear energy industry.

A rich history is evident in the pattern of land use and heritage features dating from the Neolithic period onwards, including earthworks, forts and castles and all the Roman coastal forts that form part of the Hadrian's Wall World Heritage Site."

Local

4.4.4 This appraisal will consider the following landscape character studies:

i) Copeland Landscape Character Assessment, 2021
ii) Lake District National Park Landscape Character Assessment and Guidelines, Revised 2021
iii) Cumbria Landscape Character Guidance and Toolkit, 2011

4.4.5 The landscape appraisal focuses on the Copeland and Lake District Landscape Character Assessments. The Copeland Landscape Character Assessment is the most recent, and therefore relevant, landscape study, however it frequently

references the Cumbria Landscape Character Guidance as a data source, hence its inclusion as a relevant source of data for this appraisal.

4.4.6 The Site is situated within **LCT 9a: Intermediate Moorland and Plateau – Open Moorlands** and this 'host' character type forms the focus of the landscape appraisal. In addition to these LCT's, the Study Area consists of the following areas most likely to be subject to change due to the Proposed Development, in particular where there is extensive ZTV coverage, as demonstrated on **Figures 1a** and **1b**:

iv) 5a: Lowland ridge and valley (Copeland).
v) 5c: Lowland – Rolling Lowland (Copeland).
vi) 5d: Lowland – Urban Fringe (Copeland).
vii) 9a: Intermediate Moorland and Plateau – Open Moorlands (Copeland).
viii) 9d: Intermediate moorland and plateau – Ridges (Copeland).
ix) 12b: Higher Limestone – Rolling Fringe (Copeland) which directly connects to (Lake District) J: High Fell Fringe.

4.4.7 These Copeland and Lake District National Park LCT's will be reviewed as part of the appraisal of effects Section 5.

4.5 Visual Baseline

ZTV and General Visual Context

4.5.1 Two ZTVs have been produced to determine the overall extent of theoretical visibility of the Proposed Development:

i) A ZTV of the proposed turbine hub and blade tip ZTV (**Figures 2.1 and 2.2**).
ii) A comparative blade tip ZTV of the operational turbine on the site and the proposed turbine (**Figure 2.3**).

4.5.2 The ZTVs illustrate the following with regards theoretical visibility coverage of the proposed turbine:

i) The majority of visibility would mostly be contained within a 4km radius from the site, with two other main areas of visibility within 10km: one located 8-10km directly to the north between Seaton and Great Broughton; and one located 5-9km north-west of the Site between Dean and Greysouthen.
ii) The Site is located on a gentle north-facing slope and the ridgeline associated with the slope, which is orientated south-west to north-east, is located

approximately 3km south-east of the Site at its nearest point. This would almost entirely screen views beyond 4km to the south and south-east of the Site. It would also provide a backdrop to views of the Proposed Development from receptors to the north of the Site.

iii) Much of the coastline is excluded from the ZTV, likely due to its low position and there would be at most glimpsed views of the proposed turbine from the English Coastal Path. Visibility would be constrained to a small section of coastline beside Workington.

iv) Distington is located 1km north-west of the Site and there would be views of the Proposed Development, particularly from peripheral locations which aren't screened by buildings and from upper storey windows which face the Site.

v) There is theoretical visibility from nearby settlements of Workington, Seaton and Dean. However, ground truthing of the ZTV on site has demonstrated that visibility of the proposed turbine would be limited to isolated locations within the settlements as buildings and intermittent tree cover screen most views out. Some views may be possible from upper storey windows of properties on the periphery of settlements which face the site. Views from Whitehaven are unlikely, with only a relatively small extent of ZTV coverage on the settlements.

vi) The ZTV coverage extends into the very western extent of the Lake District National Park, which is 7km away at its nearest point. However, coverage is sporadic and relatively limited, indicating negligible visual effects overall on receptors within the National Park.

4.5.3 The comparative ZTV illustrated on **Figure 2.3** demonstrates that the potential additional visibility of the proposed turbine would be relatively limited in relation to that of the operational turbine, indicating that visual effects are likely to be contained to areas where the turbine is already a feature of existing views and therefore the assessment of landscape and visual effects primarily relates to the increase in size of turbine in existing views and on the same landscape character areas. However, there are some areas of additional visibility identified, the most notable of which are:

i) At the northern extent of Distington, however the Lillyhall Industrial Estate would largely screen views from there.

ii) An area 3km south and south-east of the Site, on top of the ridgeline, albeit there is a large woodland block there which would screen much of that area.

iii) An area to the west of Broughton, 8km north-east of the Site, however this largely comprises a former dog training centre which is close to the public.

iv) An area on the north-eastern extent of Whitehaven, 5km south-west of the Site, however ground-truthing of the ZTV indicated there is screening by buildings in that area.

4.5.4 The ZTV on **Figure 1** shows that the ZTV coverage for the proposed turbine reaches into the Lake District National Park, however this coverage is sporadic and fairly limited.

Viewpoints

4.5.5 The LVA includes an appraisal of visual effects from eight representative viewpoints. The locations of the viewpoints are shown on **Figures 2.1 and 2.2**. Wireframes and photomontages from each viewpoint are presented on **Figures 4.1 to 4.8.** The Viewpoints illustrate the view towards the Site from different directions within the Study Area, and in some instances the degree to which views of the Site are screened by existing features. The precise location of each Viewpoint was determined in the field, following a review of the relevant published studies and ZTVs.

4.5.6 In accordance with the guidance set out in GLVIA 3, each viewpoint falls into one (or more) of three broad categories, as follows:

i) Representative viewpoints (which represent the experience of different types of receptors in the vicinity of the viewpoint).

ii) Specific viewpoints (a particular view, for example a designed view, or from a well-known beauty spot).

iii) Illustrative viewpoints (which illustrate a particular effect/issue, which may include limited or no visibility).

4.5.7 It is important to recognise that the absence of a viewpoint from a particular location does not imply that there would be no view of a development proposal. NatureScot's visualisation guidance document states:

"It is important to stress that viewpoint assessment forms just one part of LVIA. Because of the powerful nature of viewpoint images and the widespread recognition of some of the locations from where these are taken, there is often over-emphasis on their role…"

4.5.8 **Table 1** sets out the viewpoint type and the representative visual receptors covered by each viewpoint.

Table 1: Representative Viewpoints

Viewpoint	British National Grid Coordinates & Elevation (AOD)	Viewpoint Type / Visual Receptor
1 – Distington	300736, 523675 72m AOD	Representative Viewpoint - Residential area, located 1.2km to the west of the Site
2 – Dean	307113, 525506 101m AOD	Representative Viewpoint - Residential area, located 5.7km to the east, north-east of the Site
3 – Gilgarran	302827, 523241 133m AOD	Representative Viewpoint - Residential area and footpath located 1km to the east of the Site
4 – Workington	299352, 525990 27m AOD	Representative Viewpoint - Residential area located 3.7km to the north-west of the Site
5 – Workington Pier	298448, 529423 20m AOD	Representative Viewpoint – footpath users, located 7km to the north-west of the Site
6 – Little Broughton	307105, 531218 59m AOD	Representative Viewpoint – residents located 9.5km to the north-east of the Site
7 – Lake District National Park (Blake Fell)	311036, 519681 572m AOD	Specific Viewpoint - Footpath users, located 10km to the east, south-east of the Site
8 – Springhill Farm Footpath	302039, 522294 147m AOD	Representative Viewpoint – residents and footpath users located 1km to the south of the Site

5.0 APPRAISAL OF EFFECTS

5.1 Construction Stage

5.1.1 Refer to the Planning Statement for a description of the construction stage of the Proposed Development.

5.1.2 The construction process is described in the Planning Statement and would comprise the decommissioning and removal of the existing turbine, and the subsequent installation of the proposed turbine.

5.1.3 A new access track to the Site would be used during the construction process, along with the existing hard standing to accommodate the mobile crane units required to remove the existing turbine and erect the proposed turbine. It is anticipated that decommissioning of the existing turbine, and installation and commissioning of the replacement turbine would last for approximately 6 weeks.

5.1.4 Central to the construction would be the use of cranes, which by virtue of their height would potentially be visible for some distance, but their permeable structure would reduce their perceived mass. Cranes would be present for a limited duration only, a proportion of the timescales stated above. Whilst visual effects would result from the presence of cranes and the construction activity, these would be short-term and temporary in nature, and would occur in a context where wind turbines and pylons are already locally prominent vertical structures.

5.1.5 Artificial lighting may be required on a temporary basis during the construction period, in order to ensure the health, safety and welfare of those on the Site. In some instances lighting may be required for work on elevated structures, including crane mounted lighting. Lighting would be minimised as far as reasonably practicable. The Construction Environmental Management Plan (CEMP) will include measures to monitor and control lighting levels and light spillage throughout the construction process. As such the main construction lighting would be limited to hours of poor daylight during this period. Some low level lighting may also be required throughout the night for security reasons.

5.1.6 All construction effects would be limited in scale and duration. Whilst there would be some localised adverse change, the effects of this upon landscape character and upon the visual receptors would not be significant.

5.2 Operational Stage Landscape Effects

Landscape Character

5.2.1 An appraisal of effects upon the character of the host landscape character type: **9a: Intermediate Moorland and Plateau – Open Moorlands**, and the directly adjacent landscape character type: **5d: Lowland – Urban Fringe** is presented subsequently. For the other character areas which were identified in the baseline section as having the potential to be subject to landscape effects due to the proposed development, a more focused narrative approach has been adopted given that they would be subject to indirect influence, i.e. the proposed turbine does not fall directly within their boundaries.

9a: Intermediate Moorland and Plateau – Open Moorlands

5.2.2 This LCT is described in the Cumbria Landscape Character Guidance and Toolkit as follows: *"High, generally open landscape. The predominant land cover is a mixture of semi-improved pasture in large rectangular 'lots' and extensive areas of unimproved and unfenced moorland. In some places the open moorland has been semi improved for farmland and has a more managed character. This is typically found in the west. Fields are mainly bounded by species rich hedges with hedgerow trees or wire fences. Areas of wet mossland intersperse the pasture and moorland and retain a wilder and more unmanaged character."*

5.2.3 The key characteristics of the Intermediate Moorland and Plateau LCT – Open Moorland, include:

"High mostly open landscapes.

Undulating semi-improved and unimproved pasture

Open rough moorland

Areas of deciduous woodland

Areas of peat and raised mire."

Landscape Sensitivity

5.2.4 The following points summarise the key considerations of this LCT in relation to the sensitivities of the landscape:

"The open character and expansive views across moorland and higher farmed areas are sensitive to large scale infrastructure development that could obscure or significantly interrupt the views.

The small wooded valleys and shelterbelts that intersperse the open moorland and farmland are sensitive to changes in land management.

The species rich hedgerows and wet mossland and flushes that provide biodiversity interest away from moorland and the archaeological remains and earthworks that provide cultural interest are sensitive to changes in land management.

Contrast of rough moorland with improved pasture provides interest and is sensitive to changes in land management."

5.2.5 The defining characteristics of this LCT which indicate its susceptibility to the type of changes associated with the Proposed Development are:

i) It is a relatively large-scale landscape, reducing the perceived scale of individual elements such as buildings and structures, indicating a lower level of susceptibility to the type of change proposed.
ii) It is a generally open and intensively farmed landscape, however it is also a sloping landscape which limits visibility from its southern extent. This indicates a medium level of susceptibility to the type of change proposed.
iii) There is an obvious pattern of hedgerow and occasional woodland cover on field boundaries, creating depth and pattern in the view, reducing the prominence of built features, such as farmsteads and wind turbines, including the operational turbine on the site. This indicates a medium level of susceptibility to the type of change proposed.
iv) An observation from site surveys is that there are other tall elements in the vicinity of the site, including the operational turbine on the site, other turbines and a line of pylons located 1.5km south-east of the Site. This indicates a lower level of susceptibility to change.

5.2.6 Taking these characteristics into account, the susceptibility of this LCT is considered to be **Medium.**

5.2.7 This part of the LCT doesn't associate with any overarching landscape designations and it is of **Low** landscape value. Considering the level of susceptibility to change and value attributed to this LCT, its overall sensitivity is considered to be **Medium**.

5.2.8 With regards potential change to LCT 9a due to the proposed development, the following is noted:

i) There is an operational turbine on the site and therefore the change primarily relates to the introduction of a taller wind turbine which would be 86m to blade tip.

ii) The site is located at the northern extent of the LCT and there are occasional tall structures, including pylons and operational wind turbines, within the surrounding area which would limit the change that the proposed turbine would incur.

iii) **Figure 3.2** indicates that visibility of the proposed turbine within LCT 9a would be limited primarily to its northern extent due to its position on a gentle north-facing slope and the ridgeline associated with the slope, which is orientated south-west to north-east, is located approximately 3km south-east of the Site at its nearest point, screening views beyond. Ground-truthing of the ZTV on site indicated that the actual visibility would be much reduced than is shown, due to the screening effect of vegetation and buildings in Gilgarran to the east. Influence of the proposed turbine on the LCT would therefore be relatively limited, avoiding extensive change to its key characteristics.

5.2.9 In summary, the Proposed Development would incur a **Small** scale of landscape effect on the LCT 9a landscape through the replacement of an existing wind turbine with a taller turbine. As there are other tall features in the vicinity which are present features of this LCT, including a smaller wind turbine on the site, the effect due to the Proposed Development would be relatively limited. The proposed turbine would give rise to a relatively limited increase in the number of tall structures in the vicinity of the site and its influence on LCT 9a would be contained to its northern extent.

5.2.10 The Proposed Development would alter a relatively small geographical area in the context of this landscape and therefore the effect is considered to be **Localised**. The duration of operation would be **Long-term**. The landscape effect would be **Reversible** given the avoidance of loss of any trees for construction and as it could be theoretically removed and the site and character area could be returned to their original condition.

5.2.11 Combining all these criteria, it is considered that there would be a **Minor Adverse** level of landscape effect on 9a: Intermediate Moorland and Plateau – Open Moorlands due to the increase in size of the proposed turbine.

Effects on Other Landscape Character Types Within the Study Area

5.2.12 The following comprises consideration of the indirect landscape effects on LCTs which fall within the study area and which were identified in Section 4.4. as having the potential to be subject to some change due to the Proposed Development.

5d: Lowland – Urban Fringe

5.2.13 Outside of the host LCT, the nearest adjacent landscape character type is **LCT 5d**, which is described as follows:

"…subjected to urban and industrial influences for a long time and in many parts maintains a rural character. Field patterns remain distinct in the largely pastoral areas, often bounded by strong hedges and hedgerow trees. The urban influences vary. In West Cumbria small settlements associated with former mining and associated activities spread over a ridge and valley landscape. While deep mining of iron ore has largely gone, agricultural areas on restored opencast coal sites introduce modern 20th century field patterns amongst more regular field patterns associated with parliamentary enclosure. Woodland, wetland and scrub has been reintroduced through restoration schemes. Derelict land is dotted throughout the landscape. Despite the scars of former industries, much of the countryside character is still intact with wooded valleys retained along valleys that cut across the landscape..."

5.2.14 **Figure 3.2** illustrates that there would be relatively extensive theoretical visibility of the Proposed Development from LCT 5d. However, site truthing of the ZTV has indicated that the screening effect of Distington and Lillyhall Industrial Estate limits views out to the east from the LCT. When views would be possible, tall structures in and around the site, including pylons, would also be visible, which would further reduce the effect on landscape character. However, the influence of the Proposed Development on the LCT would be slightly elevated given its position on the skyline, looking east, from this LCT. Landscape change due to the increased height turbine on LCT 5d, which is of low sensitivity to change, is therefore considered to be **Minor Adverse**.

5.2.15 *5a. Lowland – Ridge and Valley*

5.2.16 This LCT is located approximately 3km north-east of the Site at its nearest point. Its key characteristics are:

"Undeveloped areas of ridge tops and valley rims are sensitive to large scale ridge line development where significant contrast could arise between small scale settlements and large scale features such as large scale wind turbines and pylons. Open and uninterrupted views from ridge tops to the Solway Firth and Lakeland Fells are sensitive to large scale infrastructure development."

"Large scale wind energy schemes have already changed the character of the sub type, particularly around Workington. Without careful control parts of this sub type could become defined by wind energy development. This could have knock on effects on the character of adjacent landscape types due to the far reaching visual effects of such development."

5.2.17 **Figure 3.2** illustrates that there would be theoretical visibility of the Proposed Development from the southern half of LCT 5a. However, site truthing of the ZTV has indicated that the screening effect of woodland cover at its southern extent would screen views further. While there would be some influence of the Proposed Development at close range, the limited visual influence and the presence of operational turbines within 5a limit change that would occur and the landscape effect due to the increased height turbine on LCT 5a is therefore considered to be **Minor Adverse**.

5c. Lowland – Rolling Lowland

5.2.18 The characteristics of LCT 5c are summarised as:

"Rolling, open and undeveloped higher ground is sensitive to tall infrastructure or large scale development... Tranquillity is greatest along rivers and is sensitive to development or farming intensification.

Energy infrastructure including large scale wind energy generation, pylons and substations should be carefully sited and designed to prevent this sub type becoming a wind energy landscape. Prominent locations should be avoided and appropriate mitigation should be included to minimise adverse affects."

5.2.19 **Figure 3.2** illustrates that there would be relatively extensive theoretical visibility of the Proposed Development from LCT 5c. However, site truthing of the ZTV has indicated that the screening effect of tree and hedgerow cover, combined with the rolling lowland position would limit views out. However, the influence of the Proposed Development on the LCT would be slightly elevated given its position on the skyline,

looking east, from this LCT. The landscape effect due to the increased height turbine on LCT 5d is therefore considered to be **Minor Adverse.**

9d. Intermediate Moorland and Plateau - Ridges

5.2.20 The characteristics of LCT 9d are summarised as:

5.2.21 "*The open and distinct ridges and heather moorland and wide and expansive uninterrupted views to sea and the Lakeland Fells provide a sense of wildness that are sensitive to changes in land management and significant infrastructure development.*

5.2.22 *The Government's commitment to an increase in renewable energy could see increased interest in large scale wind energy schemes. The cumulative effects of schemes could have a significant adverse effect on the character of the area."*

5.2.23 **Figure 3.2** illustrates that there would be a small extent of theoretical visibility of the Proposed Development from the western facing slopes of 9d. Site truthing of the ZTV has indicated that the screening effect of tree and hedgerow cover would limit views out further. However, where views are possible, the influence of the Proposed Development on the LCT would be slightly elevated given its position on the skyline, looking north-west towards the coast from this LCT. The landscape effect due to the increased height turbine on LCT 5d is therefore considered to be **Minor Adverse.**

12b: Higher Limestone – Rolling Fringe (Copeland) which directly connects to (Lake District) J: High Fell Fringe

5.2.24 The characteristics of LCT 12b are summarised as:

5.2.25 *"Undulating landform rising from watercourses… The area predominately consists of medium scale pasture, including dairy farming, interspersed with a number of woodland blocks, particularly to the west and south, sinuous tree belts, other small tree groups, riparian woodland and individual mature field trees. Hedgerows with hedgerow trees are present along field boundaries, particularly to the south. Hedges are less common along field boundaries towards the north-east of the area, however large mature trees frequently remain and mark the edges of fields and the field pattern in general. The area is remote from any significant settlement, with human occupation consisting of scattered farmsteads, including agricultural sheds, and*

occasional isolated dwellings. Away from roads and buildings, human influence is relatively low key."

5.2.26 **Figure 3.2** illustrates that there would be a small extent of theoretical visibility of the Proposed Development from the north-western facing slopes of 12b. However, views of the Proposed Development are likely to be oblique and site truthing of the ZTV has indicated that the screening effect of tree and hedgerow cover would limit views out further. Where views are possible, the influence of the Proposed Development on the LCT would be viewed close to operational turbines, limiting the change. The landscape effect due to the increased height turbine on LCT 5d is therefore considered to be **Negligible.**

5.3 Operational Visual Effects

Viewpoint Appraisal

Table 2: Visual Effects on Representative Viewpoints

Criteria	Description of visual effect
Viewpoint 1 – Distington	
Approximate distance & direction from the Site	1.2km to the west of the Site
Receptors	Residential properties
Baseline view	This view is from gaps between houses and represents views from the upper storey windows of some properties in Distington. The view from within Distington is restricted by buildings and occasional trees around front and rear gardens. Upper storey views would comprise views across the gently sloping surrounding landscape which comprises fields bounded by trees and hedgerow. On the higher ground to the east, the existing turbine at Stubsgill Farm is evident amongst a wooded hillside which forms the skyline in that direction.
Sensitivity	This viewpoint is representative of a small number of residential receptors at the eastern extent of Distington and they are of High susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low. The overall sensitivity is considered to be **High**.
Magnitude and overall level of effect	The Proposed Development would be evident on the skyline in the mid-distance from the site. The existing turbine on the site is visible and its blades create movement in the view. The Proposed Development would be evidently taller, and while it would comprise one relatively small part of the wider view to the east, it would introduce a relatively tall feature when compared to the operational turbine. Overall, the Proposed Development would give rise to a **Small to Medium** magnitude of effect on the view. Considering the high sensitivity of the receptors in the vicinity of the viewpoint and the small to medium magnitude of effect on the view, the

	Proposed Development would give rise to a **Moderate Adverse** level of visual effect on this representative viewpoint.
Viewpoint 2 – Dean	
Approximate distance & direction from the Site	5.7km to the east, north-east of the Site
Receptors	Residential properties
Baseline view	The view is from the north-western extent of Dean and is from a less restricted viewpoint than the rest of the village which has views out screened by adjacent trees and hedgerow. The view to the west, south-west, in the direction of the Site, comprises a mosaic of gently rolling field, interspersed with blocks of woodland, farmsteads and occasional small settlements such as Branthwaite which is located directly in the line of sight of the Site. The operational wind turbine on the site is not perceptible at this distance and as intervening trees screen, however three turbines are visible in proximity to the Site.
Sensitivity	This viewpoint is located beside a road in Dean, and it is representative of possible upper storey views from a small number of residential receptors in the vicinity of Dean and they are of High susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low. The overall sensitivity is considered to be **High**.
Magnitude and overall level of effect	The blade tips of the proposed turbine would be visible on the ridgeline in the far distance from the site. There are existing tall structures on the skyline in the vicinity of the site, including three turbines which are closer to the viewpoint and therefore appear larger. While the Proposed Development would be taller than the existing turbine on the site, it would appear smaller than the nearby structures, and it would comprise a relatively small part of the wider view to the west, south-west, with the intervening gently rolling landform and tree cover creating depth in the view that would reduce the prominence of the turbine. Overall, the Proposed Development would give rise to at most a **Small** magnitude of effect on the view. Considering the high sensitivity of the receptors in the vicinity of the viewpoint and the small to medium magnitude of effect on the view, the Proposed Development would give rise to a **Minor Adverse** level of visual effect on this representative viewpoint.
Viewpoint 3 – Gilgarran	
Approximate distance & direction from the Site	1km to the east of the Site
Receptors	Footpath users
Baseline view	Views from residents in Gilgarran have their views screened by intervening vegetation and the slope in topography which is orientated away from the Site. This viewpoint is taken from a footpath located on the western edge of the village and affords open views out towards the site which is at relatively close range. Views are across gently undulating farmland, bound by hedgerows and woodland belts. A large, detached residential dwelling can be directly to the west with the existing Stubsgill Farm turbine evident close to it. Both elements are a focal feature of the view from this viewpoint. In the distance, the horizon is lined with wind turbines of varying sizes.
Sensitivity	While this footpath doesn't link to a longer distance route, footpath users on the path are likely to take a particular interest in views of the landscape around them and are of a **Medium** level of susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low.

	The overall sensitivity is considered to be **Medium**.
Magnitude and overall level of effect	The proposed turbine would be prominent to the west in the view due to the open and expansive views across the landscape and the proximity to the Site. The taller turbine would present an obvious new feature, however the existing presence of turbines and electricity pylons in the view would reduce the likely visual change. Taking into account the **Medium** sensitivity of the receptor and the **Medium** magnitude of effect, the level of effect would be **Moderate Adverse.**
Viewpoint 4 – Workington	
Approximate distance & direction from the Site	3.7km to the north-west of the Site
Receptors	Residential properties
Baseline view	This view is taken from elevated ground within Workington which isn't restricted by intervening properties or tree cover. The view is over the residential properties within Workington towards a ridgeline in the direction of the Site. The operational turbine is screened from view, however there are other tall structures, including turbines, on the horizon.
Sensitivity	This viewpoint is located beside a road , and it is representative of possible upper storey views from a small number of residential receptors in the vicinity of Workington and they are of High susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low. The overall sensitivity is considered to be **High**.
Magnitude and overall level of effect	The blade tips of the proposed turbine would be glimpsed on the horizon, largely screened by intervening topography and tree cover. The wind turbine would form a barely perceptible element in a view that includes other tall elements. Overall, the Proposed Development would give rise to a Negligible magnitude of effect on the view. The level of effect would therefore also be **Negligible**.
Viewpoint 5 – Workington Pier	
Approximate distance & direction from the Site	7km to the north-west of the Site
Receptors	Footpath users
Baseline view	This viewpoint is from a slightly elevated area of land on the coastal path. The view to the south-west is of Workington, including residential areas, industrial units and other tall structures. Wind turbines and pylons can be seen in the distance, below the skyline.
Sensitivity	Footpath users on the Coastal Path take a particular interest in views of the landscape around them and are of a **High** level of susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low. The overall sensitivity is considered to be **High**.
Magnitude and overall level of effect	The proposed turbine would be barely perceptible in the view due to the distance from the viewpoint (7km) and the minor proportion of the panoramic view that it would occupy. The surrounding built form and context of Workington town also draw the eye from this position, reducing the change due to the proposed turbine. Overall, the Proposed Development would give rise to a **Negligible** magnitude of effect on the view. The level of effect would therefore also be **Negligible.**
Viewpoint 6 – Little Broughton	

Approximate distance & direction from the Site	9.5km to the north-east of the Site
Receptors	Residential receptors
Baseline view	The view is from the western extent of Little Broughton and is from a less restricted viewpoint than the rest of the village which has views out screened by adjacent trees and hedgerow. The view to the south-west, in the direction of the Site, comprises a mosaic of gently rolling field, interspersed with blocks of woodland, farmsteads and occasional small settlements. The operational wind turbine on the site is not easily perceptible at this distance and as intervening trees screen, however there are many visible within the same view.
Sensitivity	This viewpoint is located beside a road in Little Broughton, and it is representative of possible upper storey views from a small number of residential receptors in the vicinity and they are of High susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low. The overall sensitivity is considered to be **High**.
Magnitude and overall level of effect	The blade tips of the proposed turbine would be glimpsed on the ridgeline in the far distance from the site. There are many existing tall structures on the skyline in the vicinity of the site, including turbines which are closer to the viewpoint and therefore appear larger. While the Proposed Development would be taller than the existing turbine on the site, it would appear smaller than the structures, and it would comprise a relatively small part of the wider view to the south-west, with the intervening gently rolling landform and tree cover creating depth in the view that would reduce the prominence of the turbine. Overall, the Proposed Development would give rise to a **Negligible** magnitude of effect on the view. The level of effect would therefore also be **Negligible.**
Viewpoint 7 – Lake District National Park, Blake Fell	
Approximate distance & direction from the Site	10km to the east, south-east of the Site
Receptors	Footpath users
Baseline view	This is a location on an elevated hillside at the western extent of the Lake District National Park and it comprises panoramic views towards the coast and Irish Sea. Long distance views of the lowland valley are available, with woodlands and settlements of varying sizes scattered across the plain. Views of other tall structures are possible scattered along the coastline, including: many other turbines, pylons and telecommunications masts.
Sensitivity	Footpath users take a particular interest in views of the landscape around them and are of a **High** level of susceptibility to change. This view is a recognised viewpoint from Blake Fell within the Lake District National Park and is therefore of **High** value.
Magnitude and overall level of effect	Views of the proposed turbine would be possible from this viewpoint, although it would form a barely perceptible element within the panoramic views of the coastal landscape and Irish Sea. The Proposed Development would be visible in the far distance, with the sea as a backdrop, however other tall structures are evident and it would not disrupt the views from this location. Overall, given that it would be backclothed by land rather than sea, and that there are many operational turbines nearby, the Proposed Development would give rise to a **Negligible** magnitude of effect on the view. The level of effect would therefore also be **Negligible.**
Viewpoint 8 – Springhill Farm Footpath	

Approximate distance & direction from the Site	1km south of the Site
Receptors	Residents of the farm and footpath users
Baseline view	This view is from the footpath at the entrance to Springhill Farm. It comprises gently undulating wooded hillsides interspersed with occasional industrial and agricultural buildings. The full extents of the existing turbine can be seen clearly in the view, along with several other vertical features across the skyline which include wind turbines, electricity pylons and masts. Several large wind farms are prominent on the horizon and are a key feature of views from this aspect.
Sensitivity	Footpath users and residents take a particular interest in views of the landscape around them and are of a **High** level of susceptibility to change. There is no notable value attributed to the view, such as a designated landscape, therefore the value is Low. The overall sensitivity is considered to be **High**.
Magnitude and overall level of effect	**Medium** The proposed turbine would be a prominent feature in the view due to the increase in height from the existing turbine with the hub of the proposed turbine being evident above the visible skyline where it previously hadn't. However, the existing presence of turbines and electricity pylons in the view would reduce the likely visual change. Taking into account the **High** sensitivity of the receptor and the **Medium** magnitude of effect, the level of effect would be **Moderate-Major Adverse.**

Summary of visual effects

5.3.1 The detailed appraisal of the eight selected representative viewpoints and associated desk and site studies, including analysis of the ZTV shown in **Figures 2.1 and 2.2,** has established that the following are key observations with regards the potential visual effects of the proposed turbine:

i) Overall, site studies demonstrated that views towards the site from within the study are generally screened by: intervening vegetation, which mainly comprises low level hedgerow and occasional small woodland blocks; gentle undulations in the landform; and buildings within the settlements. Views from the

ii) The main receptors of the Proposed Development would comprise: users of footpaths located within a maximum of 4km from the site and occasional residential properties (mainly upper storey windows) located nearby or on the edges of settlements which face towards the site. The Site is located on a gentle north-facing slope and the ridgeline associated with the slope, which is located approximately 3km south-east of the Site, would almost entirely screen views beyond 4km to the south and south-east of the Site. There would be additional areas of visibility within 10km to the north: one located 8-

10km directly to the north between Seaton and Great Broughton; and one located 5-9km north-west of the Site between Dean and Greysouthen.

iii) Views of the Proposed Development from the Lake District National Park would be relatively limited and comprise occasional views from high points, such as Blake Fell which is represented by Viewpoint 7, located at the very western extent of the National Park. Where visible, the Proposed Development would be set close to the coastline, with a backdrop of the land and it would form a very small element with various other wind turbines evident.

iv) Fleeting, glimpsed views of the proposed turbine blades would be possible in an easterly direction from the England Coastal Path, as represented by Viewpoint 5. However, the Proposed Development would be barely perceptible due to the low topographical position of the coastline which would screen most views.

v) The most notable change to views is from nearby footpaths and residential properties, particularly Viewpoint 8 which represents properties located 1km south of the Site. A Moderate-Major level of effect has been identified from this Viewpoint due to the proximity of the proposed turbine and its visibility above the skyline.

vi) Similarly, visual effects would be experienced from the nearby villages of Distington and Gilgarran which lie within 2km north east and south west of the proposed turbine. Due to the proximity of these two locations and the nature of the topography, changes to the scale of the turbine would be perceptible, particularly from Viewpoint 3 where it would form a prominent feature of the surroundings. A Moderate Adverse level of effect has been identified on Viewpoint 1 in Distington and Viewpoint 3 in Gilgarran. However, the viewpoint locations are located on the periphery of the settlements where views are possible and most views from within the settlements would be screened.

vii) Views from other settlements within the study area would also be limited, due mainly to the screening effect of properties within the settlements. Specific observations from site work are: that from Whitehaven, the sloping topography would restrict views of the Proposed Development; and from Dean, which is 5.7km east, north-east of the Site, glimpsed views from the periphery of the settlement would be possible and while the Proposed Development would be taller than the existing turbine on the site, it would

appear smaller than the nearby structures, and it would comprise a relatively small part of the wider view to the west, south-west, with the intervening gently rolling landform and tree cover creating depth in the view that would reduce the prominence of the turbine.

viii) While there would be some longer range views of the Proposed Development within the study area, where adjacent hedgerow, occasional woodland blocks or small settlements don't screen the view out, locations from which clear views out are likely to be infrequent. Where long-range views are possible, the Proposed Development would appear as a relatively small-scale feature within a large-scale landscape and often in close proximity to other tall structures.

6.0 SUMMARY AND CONCLUSION

6.1.1 The appraisal has concluded that the level of operational landscape effects of the Proposed Development would generally be Minor Adverse or Negligible and the operational visual effects would also generally be Minor Adverse or Negligible, with a small number of Moderate levels of effects identified on views from properties and footpaths located nearby or on the edge of nearby settlements, in relatively proximity to the site. Effects are limited due to the following key factors:

i) The limited footprint of the Proposed Development, i.e. that it comprises a single turbine development, which is located on the site of an operational, albeit smaller, wind turbine.

ii) The large-scale of the surrounding landscape which would reduce the perceived scale of the Proposed Development and can comfortably accept developments of this scale.

iii) The sloping landform upon which the Site is located and which almost entirely would screen views of the Proposed Development from the south.

iv) While the landscape and visual amenity is locally valued, there are no landscape designations on or around the site. Views from the Lake District National Park, which is located 7km east, south-east of the Site at its nearest point, would be sporadic and where possible, visual change would be limited.

v) While it is a broadly open landscape, hedgerow and occasional tree belts on field boundaries are effective in screening the Proposed Development due to the generally flat surrounding landscape.

vi) The existing presence of large-scale vertical features i.e. rows of pylons and operational wind turbines located in close proximity to the site which would remain a focus in views, limiting change due to the Proposed Development.

6.1.2 Landscape character change associated with the Proposed Development would be limited to a localised increase in tall structures as the influence of the development on surrounding character areas would be limited to occasional views. This is in part due to the screening effect of a ridge located to the south of the Site and the presence of occasional hedgerow and buildings within settlements provide an effective screen to views. The Proposed Development would be set back from the coastline and would generally not disrupt views west towards the sea. Landscape effects on the host character type, 9a: Intermediate Moorland and Plateau – Open Moorlands, would be no greater than Minor Adverse.

6.1.3 There would be no removal of trees or hedges as a result of the introduction of the development and thus there would be minimal direct landscape change, i.e. the removal of landscape features, would be negligible. Whilst the introduction of the larger wind turbine would alter the appearance of the Site, the surrounding pasture would remain in situ which would create a degree of continuity in the character of the Site.

6.1.4 Overall, visual effects would be very limited due to the same key factors. The main views of the Proposed Development would be from within approximately 4km from the site and would be from a small number of residential properties and footpaths which connect farms and local roads together. The highest level of effect identified on representative viewpoints is Moderate-Major Adverse at Viewpoint 8, which is located 1km south of the Site and representative of nearby residents. The level of effect is due to its proximity to the Site and prominent position whereby the hub of the proposed turbine would be evident above the skyline.

6.1.5 Similarly, Moderate Adverse effects would be experienced at Viewpoint 1, which is located at the eastern extent of Distington, 1.2km to the west of the Site and Viewpoint 3, which is located on the northern extent of Gilgarran. While evident on the skyline due to its partially elevated position, in each of these views the larger wind turbine would comprise a relatively narrow feature within a wider panorama. Overall, a relatively small number of visual receptors would experience any visual change due to the Proposed Development and, while this is a landscape which largely comprises large-scale open farmland and has a low level of built form, it would be visible in and amongst other tall structures such as operational wind turbines and pylons which are located within close proximity to the site.

6.1.6 The Proposed Development would not alter any of the physical features of the Lake District National Park. Views of the Proposed Development would occur at a long distance and would form only a minor element of much wider views of the landscape. The Proposed Development would not alter any of the special qualities of this designated landscape and its setting.

6.1.7 The Proposed Development would accord with the landscape objectives identified by Copeland Borough Council in the *Wind Energy Technical Document, 2022*. The area within which the turbine is located is assessed as having moderate capacity for wind energy development of this scale. This capacity assessment considers

sensitivity to development, landscape values and national designations. The presence of wind turbines at the Site is a well-established influence on the local landscape, and this would not change as a result of the Proposed Development. Therefore, the capacity of the landscape to accommodate wind energy development would not be exceeded.

Figures 1 - 4.8.4 have been submitted independently via the Planning Portal.

Appendix A – Appraisal Methodology

1.0 METHODOLOGY

1.1.1 Landscape and Visual Appraisal (LVA) is a tool used to systematically identify and assess the nature of the effects of a proposed development upon the landscape and upon views and visual amenity. The purpose of the LVA is to identify the level and nature of effect arising from a proposed development and if necessary, through an iterative design process, to inform changes to the development and evolution of mitigation strategies which minimise effects wherever possible.

1.1.2 The methodology for this LVA is informed by guidance contained within the Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute and Institute of Environmental Assessment, 3rd Edition, 2013), often referred to as 'the GLVIA'. The LVA aims to establish the following:

i) A clear understanding of the development site and its context, in respect of the physical and perceived landscape and of views and visual amenity.
ii) An understanding of the proposed development in terms of how this would relate to the existing landscape and views.
iii) An identification of likely effects of the proposed development upon the landscape and upon views, throughout the life cycle of the development.
iv) Those mitigation measures necessary to reduce or eliminate any potential adverse effect on the landscape or views arising as a result of the proposed development.
v) A conclusion as to the residual likely effects of the proposed development.

1.1.3 Professional judgement is a very important part of the LVA process at every stage of the assessment. This judgement is exercised within an assessment framework that transparently sets out the steps in the assessment process which have led to the overall conclusions. This is emphasised in Box 3.1 (page 37) of the GLVIA, which advocates a structured approach that considers the sensitivity of the receptor and magnitude of the effect.

1.1.4 To ensure the transparency of the assessment and professional judgements made, the LVA follows a standard approach, namely:

i) The establishment of the baseline conditions, against which the effects of the proposed development will be assessed.
ii) The determination of the nature of the receptor likely to be affected, i.e. its sensitivity.

iii) The prediction of the nature of the effect likely to occur, i.e. the magnitude of effect.

iv) An appraisal of the level of which effect would occur upon any receptor, by considering the predicted magnitude of effect together with the sensitivity of the receptor, taking into account any proposed mitigation measure.

1.1.5 The GLVIA clarifies that the guidance concentrates on:

"…principles while also seeking to steer specific approaches where there is a general consensus on methods and techniques. It is not intended to be prescriptive, in that it does not provide a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstance."

1.1.6 As set out above, use of professional judgement within a structured assessment framework is a very important element of the assessment of landscape and visual effects. As discussed in the GLVIA:

[2.23] "…Whilst there is some scope for quantitative measurement of some relatively objective matters, …much of the assessment must rely on qualitative judgement, for example about what effect the introduction of a new development or land use change may have on visual amenity, or about the significance of change in the character of the landscape and whether it is positive or negative."

[2.24] "…In all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others…"

[2.26] "…In carrying out an LVIA the landscape professional must always take an independent stance, and fully and transparently address both the negative and positive effects of a scheme in a way that is accessible and reliable for all parties concerned."

1.1.7 Landscape and visual matters are separate issues, although closely related and interlinked, are dealt with as such throughout the LVA. The methodologies for assessing both are outlined separately below.

2.0 LANDSCAPE ASSESSMENT

2.1.1 The landscape assessment considers the potential effects of the proposed development on the components of the landscape as an environmental resource. Landscape receptors which could be affected by a proposed development may include:

i) Individual constituent elements and features of the landscape (sometimes referred to as landscape fabric).
ii) Specific aesthetic and perceptual qualities of the landscape.
iii) The overall character and key characteristics of the landscape as experienced in different areas (e.g. landscape character areas or types).

2.2 Sensitivity

2.2.1 The nature of a landscape receptor likely to be affected, i.e. its sensitivity is determined by considering two factors, namely:

a) Susceptibility to change.
b) Value.

Susceptibility to Change

2.2.2 Susceptibility to change is defined in the GLVIA as follows:

[5.40] "This means the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning polices and strategies."

[5.41] "The assessment may take place in situations where there are existing landscape sensitivity and capacity studies, which have become increasingly common. They may deal with the general type of development that is proposed, in which case they may provide useful preliminary background information for assessment. But they cannot provide a substitute for the individual assessment of the susceptibility of the receptors in relation to change arising from the specific development proposal."

2.2.3 To understand susceptibility to change, the various characteristics/factors that make up a particular landscape must be identified and consideration given as to how these will be affected by **the specific characteristics of the proposed development**. A landscape may have different levels of susceptibility to different scales and types of development (e.g. new houses; wind turbines; power lines). Consideration is given to physical and perceptual factors which are considered together to derive an overall susceptibility to the specific type of change. Factors influencing the susceptibility of a landscape to change are set out below, **with specific reference made to vertical structures, such as wind turbines,** where applicable:

i) Scale: A larger scale landscape (relative to the development proposed) will typically be less susceptible than a smaller scale landscape.

ii) Pattern/Complexity: The susceptibility of a receiving landscape to change will be influenced by the specific pattern of features and elements present and by the complexity of this pattern. A simpler landscape pattern will typically be more susceptible than a complex one. With specific reference to tall structures, the nature of the pattern relative to the structure may be a factor e.g. whether the predominant pattern is horizontal or vertical

iii) Development/Human Influence: A landscape that includes obvious alterations to natural ground levels, includes many contemporary development elements or structures, or that is clearly functional/utilitarian in its land use will typically be less susceptible to change that introduces contemporary structures than one where development is either absent or more traditional in style, or where natural influences and natural or long-established landforms are predominant.

iv) Connections with adjacent areas: A landscape which has a clear relationship with other surrounding landscapes, for example in relation to views in and out, will typically be more susceptible than one that is more enclosed where such intervisibility not present.

v) Visual Interruption: A landscape where views are frequently interrupted by screening features, for example vegetation cover or variations in landform, will typically be less susceptible than one where there are few / no screening features.

vi) A particular landscape may have different characteristics that are more or less susceptible to change. As such, the overall susceptibility to change is allocated using professional judgement based upon consideration of the various factors outlined above and the relative weight attached to these (which will vary from landscape to landscape). The assessment of susceptibility is expressed using a

three point verbal scale of high, medium or low. Where appropriate, intermediate levels such as medium/high or low/medium are used to refine the assessment. The rationale in support of the assessment of susceptibility is set out for each receptor in the assessment, so that it is clear how each judgement has been made.

Value

2.2.4 The value of the landscape receptor is independent of any development proposal. The absence of a formal landscape designation does not necessarily imply that a landscape is of lower value. Value is defined in the GLVIA as:

[5.19] "…the relative value that is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons…Landscapes or their component parts may be valued at the community, local, national or international levels…"

2.2.5 Factors that can help in identifying valued landscapes include:

a) Presence/absence of statutory landscape designations.
b) Presence/absence of local landscape designations and associated policies.
c) Landscape quality/condition.
d) Scenic quality.
e) Rarity of particular elements/features.
f) Representativeness.
g) Conservation interest.
h) Recreation value.
i) Perceptual aspects.
j) Cultural associations.

2.2.6 The assessment of value is expressed on a similar basis to that described for susceptibility of change above. Table 2.1 indicates how the above factors have been used to determine landscape value.

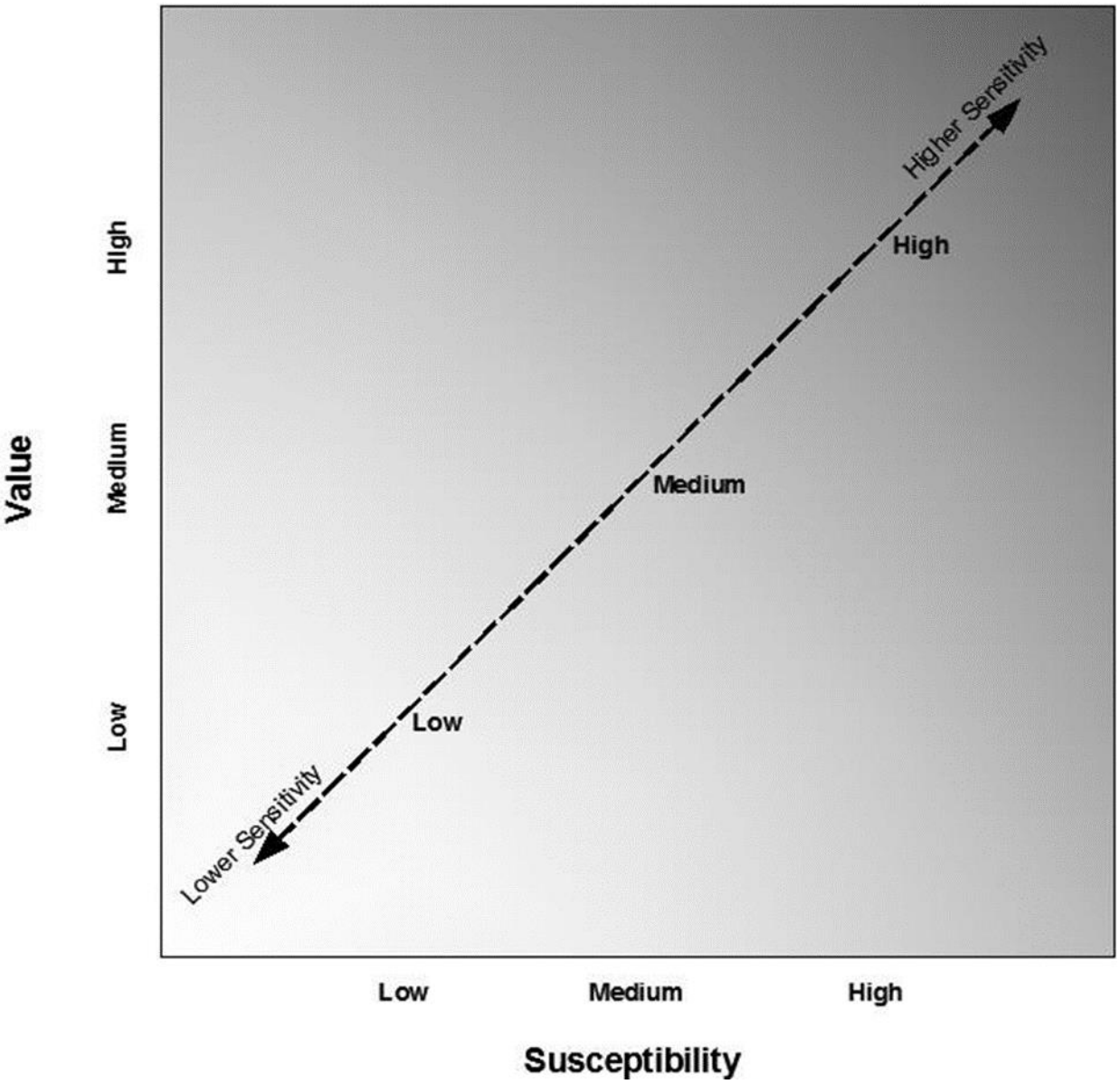
Table 2.1: Landscape Value Criteria

	Criteria tending towards higher or lower value	
	Higher	Lower
Value	Unique, and/or strongly positive landscape character, often with strong associations or (non-landscape) environmental designations. Nationally designated landscape (protected by statute).	Widespread or common landscape character. Negative character Lack of other environmental qualities Landscape without formal designation and with limited positive contribution to the locality.

Sensitivity

2.2.7 Susceptibility to change and value are considered together to determine the sensitivity of the receptor. It should be noted that the relationship between susceptibility to change and value can be complex and is not linear. For example, a highly valued landscape (such as a National Park or Area of Outstanding Natural Beauty) may have a low susceptibility to change, due both to the characteristics of the landscape and the nature of the change proposed. Figure 2.1 provides a guide as to how susceptibility and value can be combined to assess sensitivity (with the grey shading indicative of the increasing sensitivity of receptors with increasing susceptibility and / or value). However, it must be emphasised that this is only a guide and that the final assessment of sensitivity is one of professional judgement.

Figure 2:1 Indicative Sensitivity Assessment



2.3 Magnitude

2.3.1 The magnitude of change is determined by considering four separate factors, namely:

i) Size/scale of the effect.
ii) Geographical extent of the effect.
iii) Duration of the effect.
iv) Reversibility of the effect.

2.3.2 The **size and scale** of an effect is determined by considering the amount of change experienced by a receptor, including:

a) The extent of existing landscape elements that would be lost, the proportion of the total extent that this represents and the contribution of that element to the wider character
b) The degree to which aesthetic or perceptual aspects of the landscapes are altered by the removal, or introduction of new landscape components.
c) Whether the change affects the key characteristics of a landscape.

2.3.3 The **geographical extent** of an effect is the area over which effects will be experienced. It is not the same as size / scale, as a small-scale change may be experienced over a wider area, or vice-versa.

2.3.4 The **duration** of an effect simply relates to the length of time for which it would be experienced. There is no fixed definition of how these are categorised, but the following are quoted as an example in GLVIA (para 5.51):

i) Short term: zero to 5 years.
ii) Medium-term: 5-10 years.
iii) Long-term: 10 years or beyond.

2.3.5 Wind turbines will typically be long term infrastructure that would be in place for 25 years according to the planning consent.

2.3.6 The **reversibility** of an effect relates to whether or not when the Proposed Development reaches the end of its operational life and is demolished or removed, there will be a lasting effect on the landscape. If it can be taken away and the land restored, it is reversible. If removal is impractical or unlikely it isn't reversible. In some cases, partial removal will mean that there is partial reversibility.

2.3.7 The four factors contributing to magnitude are considered together to derive an overall magnitude of effect in relation to each receptor, determined by use of professional judgement. The assessment of the magnitude of effect is expressed using a four point verbal scale of large, medium, small or negligible. Where appropriate, intermediate levels such as medium / large or small / medium are used to refine the assessment.

2.3.8 Table 2.2 provides some descriptors for each of the four points on the scale which indicate how the above factors can be used to inform magnitude of effect. These are very much examples rather than definitive – in reality the factors combine in multiple different ways and every case will be different. As such the circumstances of each

specific case are reflected in a reasoned narrative within the LVA in order to explain the particular magnitude of change allocated to each receptor.

Table 2.2: Magnitude of Landscape Change Criteria (indicative)

Magnitude	Description
Large	A substantial change or loss in landscape characteristics and/or introduction of a very incongruous feature influencing an extensive geographical area and/or which may result in a permanent and perhaps irreversible landscape impact.
Medium	A moderate change or loss in landscape characteristics and/or introduction of an incongruous feature influencing a large geographical area, and/or which may be reversible in the long term.
Small	A small change or loss in landscape characteristics and/or introduction of a feature which would influence a relatively localised geographical area, and/or which may be reversible over a short duration of time.
Negligible	A barely perceptible change or loss in landscape characteristics and/or the perception of change would be focused on a small geographical area, and/or which is almost or completely reversible.

3.0 VISUAL ASSESSMENT

3.1.1 The visual assessment is concerned with the potential effects upon the population likely to be affected (i.e. the views experienced by people). As is the case for landscape effects (Section 2.0), the sensitivity of the receptor affected is identified, as is the magnitude of the effect that would occur which are then considered together to determine the level of effect.

3.1.2 A key part of the visual assessment is the assessment of effects from a number of predetermined viewpoints, which reflect views available to different groups of people. The viewpoint itself is not the receptor; rather it is the people that would be experiencing the view. These people will generally have different responses to a change in view depending upon their location, their activity and other factors, including the weather and time of day or year. Viewpoints fall into three categories (as set out in the GLVIA):

i) Representative viewpoints (which represent the experience of different types of receptors in the vicinity).
ii) Specific viewpoints (a particular view, for example a well-known beauty spot).
iii) Illustrative viewpoints (which illustrate a particular effect or issue, which may include limited or lack of visibility).

3.1.3 Private viewpoints, such as from specific residential properties are not typically included in the LVA. It is impractical to visit all affected properties and access to private land may not be granted. Representative or specific viewpoints from nearby publicly accessible locations can typically be used to provide a suitable proxy.

3.2 Sensitivity

3.2.1 The nature of a visual receptor likely to be affected, i.e. its sensitivity is determined by considering two factors, namely:

i) Susceptibility to change.
ii) Value.

Susceptibility to Change

3.2.2 Paragraph 6.32 of GLVIA identifies susceptibility to change in view/visual amenity as:

"...mainly a function of:

The occupation or activity of people experiencing the view at particular locations.

The extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at particular locations."

3.2.3 Susceptibility to change is, in part, classified based upon the indicative criteria, provided in GLVIA, as set out in Table 3.1.

Table 3.1: Typical Visual Susceptibility to Change Criteria (indicative)

Criteria Level	Description
Susceptibility to Change	
High	Residents at home. People engaged in outdoor recreation, whose attention/interest is likely to be focused on the landscape or particular views, including from public rights of way. Visitors to heritage assets or other attractions, where views of the surrounding are an important contributor to the experience. Communities where views contribute to the landscape setting enjoyed by residents. Travellers on scenic routes.
Medium	Travellers on road, rail, or other scenic routes.
Low	People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape. People at their place of work whose attention may be focused on their work / activity and not their surroundings.

3.2.4 It is important to note that the examples set out in GLVIA and Table 3.1 above only address the first bullet point and part of the second bullet point in paragraph 3.2.2 above (which are focused on the occupation or activity of the people and the extent to which their attention is focussed on the view).

3.2.5 As such, the assessment of susceptibility in Table 3.1 and GLVIA (pages 113 &114) needs to be adjusted to reflect the requirements of the final part of the second bullet point, namely the visual amenity that people currently experience. GLVIA identifies clearly that the division between categories of susceptibility to change:

[6.35] "…is not black and white and in reality, there will be a gradation in susceptibility to change. Each project needs to consider the nature of the groups of people who will be affected and the extent to which their attention is likely to be focused on views and visual amenity…"

3.2.6 For example, the presence of existing detracting features in any given view may reduce the visual amenity of those experiencing the view. This may therefore reduce their susceptibility to certain types of change and ultimately their sensitivity.

3.2.7 The assessment of susceptibility to change is made on the same basis as for landscape effects (Section 2.0 above). A three-point scale (with intermediate levels where appropriate) is used, supported by a reasoned narrative that explains the judgement made.

Value

3.2.8 In accordance with paragraph 6.37 of the GLVIA when considering the value of a view experienced, this should take account of:

a) Recognition of the value attached to particular views, for example in relation to heritage assets or through planning designations.
b) Indicators of the value attached to views by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment and references to them in literature or art.

3.2.9 Whilst not specifically referenced in the current edition of GLVIA, the number of people likely to be affected can influence the value assigned to a particular view.

3.2.10 The assessment of value is made on the same basis as the assessment of susceptibility to change.

Sensitivity

3.2.11 Susceptibility to change and value are considered together as was illustrated in Figure 2.1. Professional judgement determines the final judgement of sensitivity, due to the non-linear and complex relationship between susceptibility and value. A reasoned narrative is set out in the LVA in order to justify the particular sensitivity assessed for each receptor, so that it is clear how each judgement has been made.

3.3 Magnitude

3.3.1 The magnitude of effect that is likely to occur is determined by considering four separate factors, namely:

i) Size/scale of the effect.
ii) Geographical extent of the effect.

iii) Duration of the effect.

iv) Reversibility of the effect.

3.3.2 The **size and scale** of an effect is determined by considering a variety of factors including:

a) the loss of or addition of features, and change in composition, and the proportion of the existing view that would be occupied by the change.

b) The degree of contrast or integration of new features or other changes with relation to the existing or remaining elements in the view (form, scale, mass, line, height, colour, texture etc.).

c) The nature of the view, namely the relative amount of time it would be experienced for and whether the views would be full, partial or glimpsed.

3.3.3 The **geographical extent** of an effect will vary from viewpoint to viewpoint and will reflect the following:

a) The angle of view in relation to the main activity of the receptor.

b) The distance from the proposed development.

c) The extent over which the change in view would be visible.

3.3.4 The **duration** of an effect simply relates to the length of time for which it would be experienced, i.e. short, medium or long term in a similar manner as was set out for landscape effects.

3.3.5 The **reversibility** of an effect relates to the prospects and practicality of an effect being able to be wholly or partially reversed, or whether the change cannot realistically be reversed, i.e. it is permanent.

3.3.6 These four factors are then considered together to derive an overall magnitude of effect for each receptor, which is determined by use of professional judgement. The assessment of the magnitude of effect is expressed using a four point verbal scale of large, medium, small or negligible. Where appropriate, intermediate levels such as medium/large or small/medium are used to refine the assessment.

3.3.7 Table 3.2 indicates with some descriptive text how the above factors could be used to inform magnitude of effect. As the circumstances of each specific receptor will vary, a reasoned narrative is set out in the LVA for each view in order to explain the particular magnitude of effect allocated to each receptor.

Table 3.2: Magnitude of Visual Effect Criteria (indicative)

Magnitude	Description
Large	A change which introduces a prominent new feature, and/or something of a larger scale to existing elements in the view, which may be seen across an extensive area or experienced from a long section of a route, and/or a longer-term effect, and/or significant contrast with the existing view.
Medium	A change which introduces an obvious new feature, and/or something at a slightly bigger scale to existing elements in the view, which may be seen across a wider area or experienced from a section of a route, and/or a medium-term effect, and/or broadly compatible with the existing view.
Small	A change affecting a smaller proportion of a view, which may be seen from a limited area or experienced from a short section of a route, and/or a shorter-term effect, and/or compatible with the existing view.
Negligible	A change which is barely perceptible in the view, and/or which is only glimpsed from a route.

4.0 LEVEL OF EFFECT

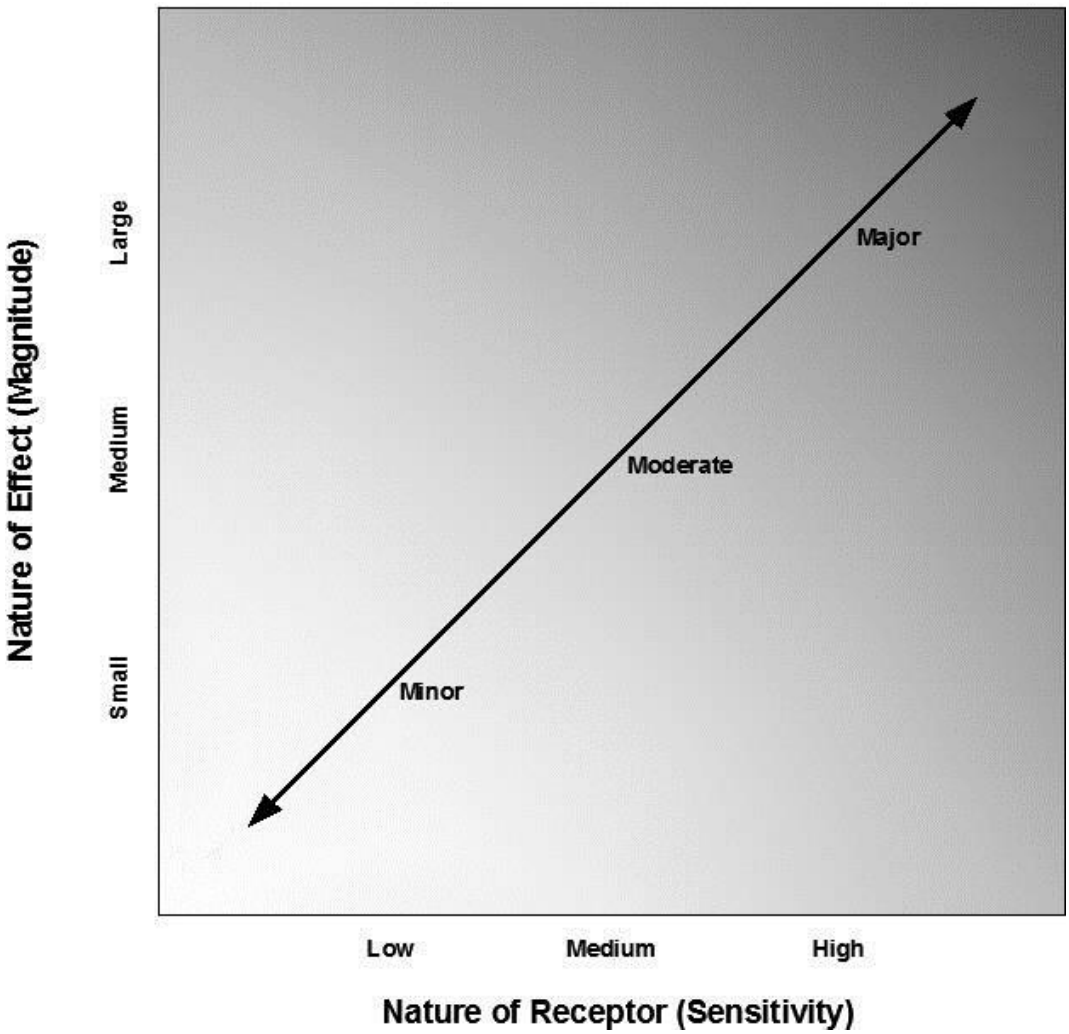
4.1.1 Having applied professional judgement to assess the sensitivity of the baseline landscape and visual environment and to consider the magnitude of potential change that the Proposed Development would cause. These are then combined using further professional judgement to consider the level of effect.

4.1.2 An LVA is not typically produced as part of an Environmental Impact Assessment (EIA) process and therefore it is not necessary to identify “significant effects.” It is however still appropriate to draw attention to any changes to landscape character or visual amenity which may be of particular note to the determining authority when determining the acceptability of a proposal. This approach is supported by GLVIA3 and subsequent clarifications provided by the Landscape Institute.

4.1.3 The level of effect can only be defined in relation to each particular development and its specific location. It is for each LVA to determine how judgements about receptor sensitivity and the magnitude of effect should be combined to derive the level of effect and to clearly explain how this assessment has been made.

4.1.4 Figure 4.1 (following page) provides a guide as to how sensitivity and magnitude can be combined to identify the level of effect upon a receptor (with the grey shading indicative of the increasing level of effect with increasing sensitivity and/or magnitude). Ultimately the final assessment of the level of effect is one of professional judgement and should be explained with narrative rather than simply relying on a matrix or diagram.

Figure 4.1: Level of Effect Matrix (indicative)



4.1.5 It should be noted that effects may be either adverse (negative) or beneficial (positive). If change occurs, with no obvious deterioration or improvement resulting, this can be said to be neutral.

Appendix B – Visualisation and ZTV Methodology

1.0 INTRODUCTION

1.1.1 This appendix provides the methodology for the production of visualisations.

1.1.2 Current good practice in the production of visualisations are set out within Landscape Institute TGN06/19 which has been referenced in the production of visualisations for the Proposed Development.

1.1.3 It should be recognised that production of visualisations is only one component of a Landscape and Visual Appraisal ('LVA'), which will consider a range of other factors when identifying and assessing changes to the landscape and to views. The use of visualisations is a useful aid when undertaking LVA, but the assessment process is not dependent on them. LVA may be undertaken without use of visualisations, but the inclusion of visualisations is accepted practice.

2.0 ZONE OF THEORETICAL VISIBILITY

2.1.1 The Zone of Theoretical Visibility of the Proposed Varied Development is computer-generated using topographical relief data, usually referred to as a Digital Terrain Model (DTM).

2.1.2 Ordnance Survey OS Terrain 50 data was used to generate the ZTV. This consists of a series of spot levels at 50m intervals. The root-mean-square error (RMSE) of the DTM is approximately 4m, i.e. the difference between the actual on-the-ground height of any particular location and the height as indicated by the DTM would be 4m or less.

2.1.3 The ZTV was calculated using QGIS open source software, taking account of the curvature of the earth's surface and light refraction. In order to offset any potential inaccuracies in the DTM data, the eye height of the viewer was set at 2m above ground level. The ZTV calculation did not use mathematically approximate methods.

2.1.4 The theoretical visibility of the turbine hub and the tip of the turbine blade was calculated and displayed graphically by using different colours according to how many turbine hubs or blade tips are visible.

2.1.5 The hub ZTV identifies areas from which any part of the main tower of the existing and proposed turbines could theoretically be seen. The blade tip ZTV identifies areas from which any part of the existing and proposed turbines from the base of the tower to the tip of an upright blade could theoretically be seen. A comparison of the

hub and blade tip ZTVs can be helpful in understanding the nature of visibility (i.e. whether full or partial views of turbines are available at any given location).

2.1.6 The ZTVs were produced based on the bare-earth DTM only and do not reflect the presence of screening features such as vegetation, buildings, walls/fences and other structures. As such, they represent a worst-case maximum of theoretical visibility only.

2.1.7 One limitation of this technique is that actual zones of visibility are not determined by topography alone. Other elements in the landscape act as screens, such as buildings, or filters such as hedgerows and woodlands. Screening and filtering of views by these elements can sometimes be very significant. In addition, a ZTV takes no account of the scale of the turbines in the view due to distance or truncation of views; it simply illustrates that a part of the structure would be visible.

2.1.8 The hub and blade tip ZTVs are presented on A1 paper using 1:50,000 scale Ordnance Survey mapping as a backdrop, to accord with the NatureScot guidance referenced above.

3.0 VIEWPOINT VISUALISATIONS

3.1 Photography

3.1.1 All photography for this assessment was taken using a digital single-reflex lens (DSLR) camera with a full-frame sensor, using a 50 mm lens. The camera is mounted on a tripod to ensure a stable support and minimise camera shake and a panoramic tripod head with built-in spirit level, which allows for the rotation of the camera at fixed intervals around a fixed point in vertical alignment with the camera lens, thereby eliminating parallax error. The camera is levelled using an auto-leveler device. Camera height was at a comfortable eye height being 1.5 to 1.6 m above the ground depending on the local ground conditions.

3.1.2 Photographs were taken over a full 360-degree sweep from each viewpoint location. The precise location of each photograph was recorded using a GNSS receiver GPS device.

3.2 Post-Photographic Processing

3.2.1 The individual photos taken on-site are stitched together using the software package PTGui. The output is a single panoramic image. The specifications of the camera

and camera lens used to take the photographs are inputted into the software to ensure the most accurate production of the final panoramic image.

3.3 Wireframes

3.3.1 Industry standard software (ReSoft WindFarm) is used for producing wireframes up to 360 degrees. Wireframes are constructed using a digital terrain model (DTM) of the bare earth surface (the Ordnance Survey Terrain 50 dataset) and the viewpoint data from the camera and photographs. The production of the wireframes makes allowance for the curvature of the earth and assumes a viewpoint height of 2m above the Ordnance Survey datum as a conservative worst case, which takes into account potential inaccuracies or discrepancies in the DTM data.

3.3.2 Wind turbine locations for a proposed development are defined to the nearest metre, using six-figure British National Grid co-ordinates. Hub heights, blade rotor diameter and other turbine dimensions are accurately modelled to correspond with the candidate turbine; or to a generic turbine model if precise details have not been finalised.

3.3.3 Based on the same input information as the wireframes and photomontages, a Google Earth file is used to double check that all viewpoint information corresponds with that which was recorded onsite. This also assists in confirming site position and extracting marker reference points used in the subsequent alignment process of wireframes and photographs.

3.3.4 Turbine models are set to face the viewer with a turbine tip pointing directly skywards to illustrate theoretical worst case visibility in terms of maximum width and height. Turbines are numbered and labelled to be consistent with references elsewhere on other documents and plans.

4.0 PHOTOMONTAGES

4.1.1 Photomontages are computer generated images; they depict a representation of the proposed wind turbines superimposed upon the existing photography, with the aim of producing a visualisation that should give a realistic impression of how the Proposed Development would appear within the landscape.

4.1.2 Using Adobe Photoshop, the wireframe and panoramic photograph are matched together to form an overlay of wireframe on top of photograph. Accuracy is ensured by using the same GPS location recorded on site, and by matching prominent

landforms and man-made objects (such as electricity pylons or telecommunication masts) as reference points where possible. This matching process will indicate turbine position upon the photograph and be used later as a reference point for positioning the rendered turbine models.

4.1.3 Turbine locations and dimensions correspond with the accompanying wireframe and are typically presented on the same page to allow direct comparison.

4.1.4 Wind turbines are rendered using ReSoft WindFarm software with a light source set to replicate as closely as possible the lighting conditions seen within the photographs that they are to be superimposed upon. Certain lighting conditions may require the turbines to be over-emphasised to enable the viewer to properly identify the location of the turbines.

4.1.5 Typically, for a greater sense of realism each turbine blade set is randomly rotated in the image. However, if this results in an image within which a blade would not be visible, or would be marginally visible when superimposed upon the photographs, then it is manually adjusted so as to be more visible. The turbines are set to directly face the view, again to present a worst case, as for the wireframes.

4.1.6 Using Adobe Photoshop, the rendered turbines are superimposed within the panoramic photograph, aligning with the previously generated wireframe. Where all or part of any turbine would be obscured by intervening features in the landscape, the non-visible sections of the turbine removed from the final image using a digital mask.

5.0 PRESENTATION

5.1.1 Once the final viewpoint images have been produced, these are then cropped to match a series of templates that accord with the output and display format required by NatureScot. Typically, the following output is produced:

1. *Baseline panorama and wireframe:* Displayed on one or more A1 width pages, with each page illustrating a 90° horizontal field of view (each image displayed at 820mm by 130mm). This shows the existing context of the viewpoint. The image is shown in cylindrical projection. The horizontal extent of the single frame 50mm lens photograph centred on the Proposed Development is indicated on the image, as is the extent of the extracted panorama used in relation to Item 3. Given the nature of the Proposed Development (repowering of an existing turbines located

in close proximity to a far larger wind farm, cumulative schemes are not shown on the baseline wireframe).

2. *Wireframe:* A wireframe produced in planar projection, using the same geometry and field of view as Item 3. The wireframe typically displays the proposed turbines only, with individual turbines numbered. The wireframe is displayed on an A1 width page.
3. *A1 panorama*: A photograph of the existing turbine, displayed on an A1 width page illustrating a 53.5° horizontal field of view and a 18.2° vertical field of view (image displayed at 260mm by 820mm). The image is shown in planar projection.
4. *A1 panorama:* A photomontage of the Proposed Development, displayed on an A1 width page illustrating a 53.5° horizontal field of view and a 18.2° vertical field of view (image displayed at 260mm by 820mm). The image is shown in planar projection.

5.1.2 These are presented as series of figures that accompany the LVIA (Figure 4.1.1 onwards).

6.0 VIEWING INSTRUCTIONS

6.1.1 Viewpoint visualisations can never provide an exact match to what is experienced in reality. Visualisations are tools in the assessment process but independent from it. They illustrate the likely change in view in the context of a specific date, time and weather conditions, that would be seen within a photograph and not as seen by the human eye. As such, visualisations need to be used in conjunction with site visits and should be considered in the context of the totality of views experienced from the viewpoint and not just focussed on the proposed wind turbine.

6.1.2 All visualisations are prepared to be technically correct at a specific viewing distance that recreates the correct perspective geometry of the view available from the viewpoint. To accurately recreate this using the printed page is difficult, particularly as the flat page does not conform easily to the biconvex lens of the human eye. As such, and in accordance with the TGN06/19 guidance referenced above, the visualisations displayed on the printed page should simply be viewed held at a comfortable arm’s length and with the page flat.