

# Appendix 6.1 - Landscape and Visual Impact Assessment Methodology

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# Appendix 6.1 - Landscape and Visual Impact Assessment Methodology

## Introduction

This Appendix provides the details of the legislation, policy and guidance which have directed the methodology for the LVIA for the Proposed Development. It provides an overview of the consultation undertaken to inform the LVIA and then provides the methodology. It should be noted that as with all guidance, the methodology needs to take into account the project specific factors. These include the size and scale of the development (i.e. numbers of turbines and their overall heights), the presence of other wind development in the study area (the extent of which depends on the height of turbines proposed), and the location of the development (Council areas have guidance specific to their administrative area). For these reasons, the Applicant has agreed the scope of the landscape and visual assessment Dumfries and Galloway Council.

It is important to note from the outset that this Appendix 6.1 Methodology for the Proposed Development specifically relates to the Chapter 6 LVIA forming an integral part of the EIA Report for this current Section 36 Application. There have been two previous applications for wind energy developments at the Proposed Development site in 2013 (Section 36) and 2015 (planning application consented in 2016). The Methodology underpinning the 2013 LVIA was undertaken in line with the *Guidelines for Landscape and Visual Impact Assessment* (Second Edition, Landscape Institute and the Institute of Environmental Management & Assessment, 2002). The LVIA submitted in 2015 was undertaken in line with a combination of the Second Edition GLVIA and the Third Edition. This LVIA has been undertaken in line with the Third Edition of the GLVIA. As such, there are some fundamental differences between the methodologies underpinning the LVIA's for the previous two applications.

Common to both editions of the GLVIA is that the use of guidance relies upon professional judgement and interpretation. In this regard, the Methodology relating to some of the Evaluation Criteria differs from this current Section 36 Application and the previous application, consented in 2016. Specifically, the judgement on Sensitivity of some receptors and the level of threshold of Significance varies within this Methodology to that cited in the Methodology embedded in the 2015 LVIA. In addition, whilst the assessment of magnitude of change is broadly the same, the context to the Proposed Development has changed with the approval (and now operational status) of Sanquhar Six, Sanquhar Community and Hare Hill Extension wind farms. Therefore, several judgements of magnitude of change for various receptors have been altered. As such, the overall residual effects and level of significance may vary. It should be stressed that this is due to changes in the methodology and changes to the baseline context to the Proposed Development, rather than changes to the Proposed Development itself. Absolutely no aspect of the Proposed Development is different from the Consented Development.

## Legislation, Policy and Guidance

Planning policy guides the EIA process and the landscape and visual impact assessments that form part of this. The Planning Chapter of the EIA Report provides detailed information regarding planning policy, whilst Section 6.2 Legislative and Planning Context of the LVIA provides a background of policy affecting landscape issues as well as an interpretation of strategic locational guidance and guidance on siting and designing wind farms in the landscape. This will not be repeated here.

## **Guidance**

In addition to planning policy and legislation pertinent to wind energy developments, the LVIA for the Proposed Development has been based on guidelines provided in the following planning policy, legislation, guidelines and publications:

- Guidelines for Landscape and Visual Impact Assessment (Third Edition, 2013. Landscape Institute and the Institute of Environmental Management & Assessment);
- Landscape Character Assessment, Guidance for England and Scotland (Countryside Agency, SNH 2002);
- The Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage (SNH update March 2009);
- Policy Statement No. 02/03 Wildness in Scotland's Countryside (SNH, 2002); and, updated map (2014). *Wild Land Areas Map*;
- Topic Paper 6 Techniques and Criteria for Judging Capacity and Sensitivity (Natural England, 2004);
- Strategic Locational Guidance for Onshore Wind Farms in Respect of Natural Heritage (SNH, 2009b);
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, March 2012);
- Spatial Planning for Onshore Wind Turbines - Natural Heritage Consideration (SNH, June 2015);
- Siting and Designing Wind Farms in the Landscape (SNH, Version 2 May 2014a);
- Visual Representation of Wind Farms (SNH, Version 2.1, 2014b);
- Siting and Designing Wind Farms in the Landscape (SNH, Version 3a August 2017);
- Visual Representation of Wind Farms (SNH, Version 2.2 February 2017);
- Onshore Wind Turbines - Online Renewables Planning Advice (The Scottish Government, May 2014);
- Visual Assessment of Windfarms Best Practice (SNH Commissioned Report F01AA303A; University of Newcastle, 2002);
- Dumfries and Galloway Council Local Development Plan (September 2014);
- Dumfries and Galloway Council Local Development Plan, Supplementary Guidance. Part 1 Wind Energy Development: Development Management Considerations (6th March 2015);
- Dumfries and Galloway Wind Farm Landscape Capacity Study (DGWLCS), Appendix to SG: Wind Energy Development;
- East Ayrshire Council Local Development Plan (April 2017);
- South Ayrshire Council Local Development Plan (September 2014);
- South Lanarkshire Council Local Development Plan (June 2015);
- Scottish Borders Council Local Development Plan (May 2016);

- Dumfries and Galloway Wind Farm Landscape Capacity Study (Carol Anderson and Alison Grant Landscape Architects, January 2011);
- Dumfries and Galloway Wind Farm Landscape Capacity Study (Carol Anderson and Alison Grant Landscape Architects, August 2017);
- East Ayrshire Landscape Wind Energy Capacity Study (Carol Anderson Landscape Architects, July 2013);
- South Ayrshire Landscape Wind Energy Capacity Study (Carol Anderson Landscape Architects, July 2013);
- South Lanarkshire Landscape Capacity Study for Wind Energy (Ironside Farrar, February 2016);
- Scottish Borders Wind Energy Capacity Study (Ironside Farrar, November 2016);
- Dumfries and Galloway Landscape Assessment, No. 94 (Land Use Consultants, 1998);
- Ayrshire Landscape Assessment, No. 111 (Land Use Consultants, 1998);
- Glasgow and the Clyde Valley Landscape Assessment (Land Use Consultants, 1999);
- Borders Landscape Character Assessment, No. 112 (Ash Consulting Group (1998); and,
- South Lanarkshire Landscape Character Assessment (Ironside Farrar, 2010).
- Dumfries and Galloway Wind Farm Landscape Capacity Study (Carol Anderson and Alison Grant Landscape Architects, January 2011);
- Dumfries and Galloway Wind Farm Landscape Capacity Study (Carol Anderson and Alison Grant Landscape Architects, August 2017);
- East Ayrshire Landscape Wind Energy Capacity Study (Carol Anderson Landscape Architects, July 2013);
- South Ayrshire Landscape Wind Energy Capacity Study (Carol Anderson Landscape Architects, July 2013);
- South Lanarkshire Landscape Capacity Study for Wind Energy (Ironside Farrar, February 2016);
- Scottish Borders Wind Energy Capacity Study (Ironside Farrar, November 2016);
- Dumfries and Galloway Landscape Assessment, No. 94 (Land Use Consultants, 1998);
- Ayrshire Landscape Assessment, No. 111 (Land Use Consultants, 1998);
- Glasgow and the Clyde Valley Landscape Assessment (Land Use Consultants, 1999);
- Borders Landscape Character Assessment, No. 112 (Ash Consulting Group (1998); and,
- South Lanarkshire Landscape Character Assessment (Ironside Farrar, 2010).

## Consultation

Consultation was undertaken throughout the scoping process. With specific regard to the LVIA, pertinent issues including representative viewpoint selection, the scope of the cumulative assessment and the methodology to be used for the LVIA were determined.

Consultation responses received in the Scoping Opinion (refer to Appendix 4.4) were mostly taken on board within the LVIA and the approach to the LVIA Methodology. The table below outlines the scoping opinion relating to landscape, visual and cumulative assessment, as well as the representative viewpoints selection. This is based upon the Landscape Scoping Opinion from Dumfries and Galloway Council Landscape Architect, dated 1 June 2017. The table includes comments on the scope of works included within the assessment.

**Table 1 - Landscape Scoping Opinion**

Paragraph number reference	Scope of Works	Comments
2.1	<p><b>Approach</b> DGC disagreed with the proposed approach in the JLL Request for a Scoping Opinion from the Scottish Ministers (April 2017) with respect to limiting the scope of the ES / LVIA to the Significant effects found for the Permitted Development. As a new application, DGC requested that all the short fallings in the previous ES / LVIA are addressed in this new application, so that the potential effects of the scheme can be fully understood. DGC requested that both the choice of representative viewpoints and the standards of the visualisation and their presentation must be re-visited.</p>	<p>A new, full and detailed LVIA has been produced, fully in line with current guidance. The LVIA of the Proposed Development has been carried out in accordance with the Third Edition of the Guidelines for Landscape and Visual Impact Assessment (GLVIA, 2013). The previously submitted LVIA (2015) was underpinned by guidance contained in both the Second Edition and the Third Edition of the GLVIA.</p>
2.2	<p><b>Redress of the short-fallings of the previously submitted ES / LVIA's</b> DGC considered that the previous LVIA's submitted for the 2013 and 2015 schemes were sub-standard in terms of information, in particular the visualisations provided and cumulative assessments. The short-fallings are outlined in 1.2.1 of the previous DGC landscape response, dated February 2016. The following requirements are noted to redress these short-fallings: Influence of Sandy Knowe on landscape character in addition to committed schemes; More representative viewpoints in Upper Nithsdale; Representative viewpoints to be presented in the main body of the LVIA, compliant with SNH visualisation guidance (2017) and addressing the cumulative context; and, A full cumulative landscape assessment and tested against the cumulative sensitivity zone (CSZ) criteria as detailed in DGC Technical Paper Wind Energy Interim Spatial Framework, version 4.11.</p>	<p>The new LVIA addresses short-fallings identified within this Scoping response and the more detailed scoping response dated February 2016. Specifically, more representative viewpoints within Upper Nithsdale have been included and assessed within the main body of the LVIA and the visualisations are compliant with SNH visualisation guidance (2017).</p> <p>The LVIA baseline includes all operational and consented wind farm developments. The influence of the Proposed Development on the landscape character is fully assessed in addition to these committed schemes. Technical Paper: Wind Energy, Interim Spatial Framework and CSZ criteria is out-dated.</p>
2.3	<p><b>Response to the JLL scoping report</b> DGC disagree with the approach and methodology set out in the JLL report:</p>	<p>The LVIA has included new photography for all representative viewpoints and an up to date baseline review has also been included.</p>

Paragraph number reference	Scope of Works	Comments
	<p>Re-use of existing photography and baseline studies; Reference to DGWLCS (See Section 3.2 below); Inclusion of wider representative viewpoints to fully appreciate the potential effects of Sandy Knowe in relation to committed developments.</p>	<p>All viewpoints suggested within the Scoping Report have been included in the LVIA and all operational and consented developments have been included in all of these viewpoints to address and provide a full and detailed assessment of potential effects in relation to committed developments.</p>
2.4	<p><b>Opportunity to reduce significant cumulative landscape and visual effects</b> DGC recommends reducing the wind farm footprint of the Consented Development to reduce Significant effects to an acceptable level. DGC recommends the removal of turbines 1, 2, 3, 4, 9, 21, 22 and 23.</p>	<p>The Proposed Development is exactly the same as the Consented Development. The layout and turbine specifications have not changed and the LVIA has not been assessed on a scheme with a reduced footprint. It is acknowledged the landscape context to the Proposed Development has changed and this has been addressed and assessed in the LVIA.</p>
3.1	<p><b>Policy and guidance</b> The proposals are assessed in landscape terms against policies in the 2014 DGC LDP.</p>	<p>All policies within the 2014 DGC LDP relevant to landscape issues are discussed within the LVIA.</p>
3.2	<p><b>DGWLCS</b> Reference should be made to DGWLCS / updated DGWLCS in the LVIA in terms of the baseline assessments, sensitivities, opportunities and constraints and the development guidance.</p>	<p>Reference has been made to the DGWLCS (2017) and the sensitivity assessment contained within the capacity study has been utilised to guide the sensitivity ratings of the Landscape Character Units within the study area. As noted within the LVIA, the DGWLCS already accounts for the Consented Sandy Knowe development within the study. The Proposed Development has not changed from the Consented Development and therefore has not changed the results of the capacity study.</p>
3.3	<p><b>Cumulative context</b> DGC recommend that the LVIA should fully assess potential cumulative effects under policy IN2, and with reference to the DGC Supplementary Guidance WED, the Technical Paper Wind Energy Interim Spatial Framework and SNH Siting and Design Guidance. DGC recommend the following wind energy developments are considered in the cumulative assessment: Hare Hill and Hare Hill Extension, Sanquhar Community Wind Farm and Glenmuckloch Wind Farm; and to a lesser extent Whiteside Hill, Sunnyside, Twenty Shilling, Sanquhar Six and potential Ulzieside.</p>	<p>All of the wind farm developments stated in the Scoping Response with the exception of Ulzieside are contained in the baseline of the LVIA given that they are operational/consented.</p>
3.4	<p><b>Other sources of information</b> The LVIA should be undertaken in accordance with GLVIA 3 (2013) and with reference to SNH's Siting and Design Guidance (2017) and up to date visualisation guidance (2017).</p>	<p>The LVIA has been undertaken in accordance with GLVIA 3 (2013), with reference to SNH's Siting and Design Guidance (2017). The visualisations have been produced in accordance with up to date SNH visualisation guidance (2017). A number of other local and</p>

Paragraph number reference	Scope of Works	Comments
	Other local and national guidance should also be referred to as required.	national guidance regarding landscape character, SNH policy statements on assessing core areas of wild land are also referred to.
4.1	<p><b>Study Area</b> DGC recommend a detailed study area of 15 km and the grain of assessment should be of landscape units, as set out in DGWLCS.</p>	The LVIA includes landscape and visual receptors within a 35 km study area and a detailed study area of 15 km. Landscape units, as detailed in the DGWLCS and other capacity studies within the study area, have been assessed within 15 km.
4.2	<p><b>Landscape</b> The LVIA should assess landscape effects in accordance with GLVIA 3 paragraphs 5.1 and 5.2 and include the following elements: Host landscape character units; surrounding LCTs/LCUs within 10 km; local landscape characteristics; the setting of settlements: Kelloholm, Kirkconnel, Crawick and Sanquhar; forestry and woodland areas and planting associated with restoration; and, areas of existing, past and consented mining.</p>	The landscape section of the LVIA assesses all landscape effects identified within the 35km study area including the landscape elements mentioned in the scoping response and in accordance with GLVIA 3.
4.3	<p><b>Visual</b> The LVIA should assess visual effects in accordance with GLVIA 3 paragraphs 6.1 and 6.2 and include the following receptors: Residents: properties within 5km, and larger settlements and villages: Kirkconnel, Kelloholm, Crawick, Sanquhar and Mennock; Travellers including residents and tourists: the railway and railway stations at Sanquhar and Kirkconnel, A76, unclassified roads, most notably within 5 km; Walkers, cyclists, horse riders: SUW, other footpaths, routes and core paths including the hill track from Kirkland to Fingland; Visitors and tourists: promoted historic sites including Sanquhar town and castle, Sanquhar golf course, Crawick Artland, St.Connel's Church; and, Walkers: views from the Thornhill Uplands RSA; and, possibly Eliock NIDL.</p>	The visual section of the LVIA assesses all visual effects identified within the 35km study area including the visual receptors mentioned in the scoping response and in accordance with GLVIA 3. The majority of visual receptors identified in the scoping response have been assessed in the representative viewpoints. All other visual receptors are mentioned in the LVIA. All properties within a 2 km radius were assessed within the Residential Viewpoint Assessment. Properties located between 3-5km are broadly represented within the 6 viewpoints located within 5km. This was considered proportional to the LVIA and scale of Proposed Development. Other receptors cited in the Scoping Response have also been included in the LVIA.
5	<p><b>Representative viewpoints</b> DGC have suggested 14 viewpoints to be included within the LVIA. The representation of all of the agreed viewpoints should include a full set of SNH compliant visualisations which in all cases show the cumulative context. All visualisations must be rationally presented in the main body of the LVIA, clearly numbered and labelled and fully assessed. Inclusion of private residential properties is recommended by DGC within 2 km of</p>	All 14 representative viewpoints suggested by DGC in the scoping response have been fully presented to SNH standards and fully assessed within the LVIA and illustrating the cumulative context. An additional 2 viewpoints were selected from the LVIA assessed in 2015 to represent viewpoints from different distances and directions. It was considered the 14 viewpoints were not representative of the study area as they were not from a variety of distances or directions, and as such, not in line with SNH guidance on

Paragraph number reference	Scope of Works	Comments
	schemes, but wirelines should be provided with baseline photographs for representation of property groups and/or individual dwellings up to 5 km.	viewpoint selection (Visual Representation of Wind Farms. Version 2.2, February 2017). All properties within a 2 km radius from the nearest turbine have been assessed within the Residential Visual Amenity Assessment (Appendix 6-2). Settlements and clusters of properties have been assessed within the LVIA. It is considered that the Viewpoints which are mostly located within 8 km of the nearest turbine broadly represent other dispersed dwellings within 5 km.
6	<p><b>Key cumulative landscape and cumulative visual effects</b></p> <p>DGC consider that given the order of applications, the current Sandy Knowe would take the burden of additional cumulative effects with greatest interaction anticipated to arise with Hare Hill, Sanquhar Community, Glenmuckloch and Sunnyside wind farms. Full reference should be made to: The Technical Paper, Wind Energy Interim Spatial Framework and the DGWLCS (2017). LVIA should present a set of SNH compliant visualisations that represent the cumulative context.</p>	<p>It is refuted that the Proposed Development should take the burden of additional cumulative effects. The Proposed Development has not changed in any way from the Consented Development. All other permitted developments in the Nithsdale area since the Consented Development have included Sandy Knowe within their cumulative assessment and it is also been accounted for in the DGWLCS. Therefore Sandy Knowe Wind Farm is not the tipping point in the capacity of wind farms in the Nithsdale area, as it has been authored in many assessments since on the basis that it already exists within the landscape. Should DGC consider that the Nithsdale area is at maximum capacity, developments permitted after the 2015 Sandy Knowe scheme should not have been consented.</p> <p>The Proposed Development will have no additional cumulative effects than those that are likely to result from the construction, operation and decommissioning of the Consented Development. Accordingly, no cumulative assessment of the Proposed Development is required.</p> <p>Reference has been made to the DGWLCS. Reference has not been made to the Technical Paper Wind Energy Interim Spatial Framework 4.1.1 due to this being out-dated The fully compliant SNH visualisations also represent the context of operational and consented schemes.</p>

## Viewpoint Selection

As part of the consultation exercise, a preliminary list of seven viewpoints was circulated to Dumfries and Galloway Council and SNH. The viewpoint list under-went several revisions and in total 14 viewpoints were agreed and included. The final list of viewpoints (refer to Table 6.10 of Chapter 6) specifically covers the issues and/or locations raised and/or requested by statutory consultees, namely Dumfries and Galloway Council. Due to the very limited range of distance and direction, it is

considered that the final list of viewpoints were not representative of the study area. Indeed, 12 of the 14 viewpoints are located within a distance of 8 km from the nearest turbine, with several groups of these from very similar distances, orientation and elevation. In addition, the viewpoints only represented 3 different landscape units of 2 landscape character types. There are a total of 14 different landscape units and 9 different landscape character types within a 15 km radius of the proposed development. Only 2 viewpoints represented views over 8 km. The spread and sheer number of viewpoints from the north and north-east therefore provides little consideration of wider views and views from other directions from where the overall influence of the Proposed Development on the landscape and in views can be fully assessed.

For assessment of wind farm developments, it is generally expected that residual effects are higher within close proximity to the wind farm and whilst SNH endorse assessing views likely to give rise to significant effects (SNH guidance Visual Representation of Wind Farms. Version 2.2, February 2017), guidance on viewpoint selection also suggest that viewpoints should ensure a well-rounded representation of views to a proposed development. Therefore, it is believed that this has resulted in a highly skewed representation of the Proposed Development, focusing on a disproportionate number of similar views from a confined, localised area where the most significant effects are likely to be experienced.

Notwithstanding, the final selection of viewpoints, as indicated in Dumfries and Galloway Council's Scoping Response dated 1<sup>st</sup> June 2017, was adhered to. In an attempt to broaden viewpoint locations and to represent views from the west and south-west as well as two different landscape units, an additional two viewpoints were selected by the Applicant.

## Scope and Method of Assessment

### ***Study Area***

The study area for the Proposed Development is 35 km, based on SNH guidance for assessing wind energy developments where the height of the proposed turbines are at 125m to blade tip.

A review of the existing landscape and visual characteristics of the study area with reference to its key features, perceived value and sensitivity to development of the nature proposed, forms the initial stage of the LVIA. The data gained from this review provides the baseline against which to assess the magnitude and significance of potential impacts arising from the Proposed Development.

### ***Baseline***

The baseline review for the landscape and visual resource has three elements:

- Description – a systematic review and digest of existing information and policy relating to the existing landscape and visual resource;
- Classification – analysis of the data to subdivide the landscape resource into discrete areas of similar and identifiable character and identify the visual receptors; and
- Evaluation – Use of professional judgement to apply a sensitivity value to a landscape or visual resource with reference to specified criteria.

The baseline review is undertaken through desk-based data review followed by a site survey to verify the findings, and then analysis of the data. This process is described in detail in the following paragraphs.

## Desk Based Data Review

Existing mapping, legislation, policy documents and other written, graphic and digital data relating to the Proposed Development and broader study area was reviewed. This included the following documents:

- The Scottish Government (May 2014). *The Scottish Planning Policy (SPP)* ;
- Dumfries and Galloway Council (September 2014). *Local Development Plan*;
- East Ayrshire Council (April 2017). *Local Development Plan*;
- South Ayrshire Council (September 2014). *Local Development Plan*;
- South Lanarkshire Council (June 2015). *Local Development Plan*;
- Scottish Borders Council (May 2016). *Local Development Plan*;
- Carol Anderson and Alison Grant Landscape Architects, (August 2017). *Dumfries and Galloway Wind Farm Landscape Capacity Study (DGWLCS)* ;
- Carol Anderson Landscape Architects (July 2013). *East Ayrshire Landscape Wind Energy Capacity Study*;
- Carol Anderson Landscape Architects (July 2013). *South Ayrshire Landscape Wind Energy Capacity Study*;
- Ironside Farrar (February 2016). *South Lanarkshire Landscape Capacity Study for Wind Energy*;
- Ironside Farrar (November 2016). *Scottish Borders Wind Energy Capacity Study*;
- Land Use Consultants (1998). *Dumfries and Galloway Landscape Assessment*, SNH Review No. 94
- Land Use Consultants (1998). *Ayrshire Landscape Assessment*, SNH Review No. 111;
- Land Use Consultants (1999). *Glasgow and the Clyde Valley Landscape Assessment*, SNH Review No. 116;
- Ash Consulting Group (1998). *Borders Landscape Character Assessment*, SNH Review No. 112;
- Ironside Farrar (2010). *South Lanarkshire Landscape Character Assessment*;
- SNH Policy Statement No. 02/03 (2002). *Wildness in Scotland's Countryside*; and, updated map (2014). *Wild Land Areas Map*;
- Historic Environment Scotland (2016). *The Inventory of Gardens and Designed Landscapes in Scotland*;
- Ordnance Survey maps; and,
- Digital sources of mapping and aerial photography.

The desk based data review also establishes the main users of the area, key viewpoints and key features, thus defining the visual baseline which requires to be verified on site. The potential visual receptors are identified and classified according to their associated use (settlements, footpaths, roads etc). The aim of the baseline review of visual receptors is to ensure that an appropriate range of viewpoints is included in the visual assessment. The potential extent of visibility of the Proposed

Development as identified in the preliminary Zone of Theoretical Visibility (ZTV) (see below for further details) provides the basis upon which the potential visual receptors are initially identified.

The desk based data review informs subsequent site work, which allows the confirmation of the Landscape Character Type (LCT), Landscape Character sub-types and Landscape Units / Areas.

### **Site Survey**

Field survey work is carried out to verify the landscape character types and landscape character areas identified within the study area, and to gain a full appreciation of the relationship between the Proposed Development, and the landscape.

The baseline visual resource is verified during the survey work and at this time, the validity of the list of representative viewpoints used in the LVIA. This includes checking initial viewpoint grid references on the ground to review potential visibility of the Proposed Development from these locations. Since the ZTV is based on a 1:50,000 digital terrain model, it does not capture local landform. There are times when a viewpoint selected from analysis of the ZTV does not actually have any views to the Proposed Development. In some instances, this can be remedied by slight adjustments of the grid references, although the location must remain relevant to the particular receptor(s) for which the viewpoint was selected. It is also important to ensure that the viewpoints remain a representative selection of views. Wireframes supported the fieldwork, and observations are recorded with photographs.

### **Data Analysis**

Analysis and reporting of the baseline resource takes place after the completion of the desk and field surveys. The baseline landscape and visual review provides a description, classification and evaluation of the landscape and visual resource of the study area.

The baseline review provides a robust description of the landscape and visual resource from which to assess the landscape and visual effects of the Proposed Development and to provide advice, in landscape and visual terms, on the Proposed Development's acceptability in principle and upon its siting, layout and design. This involves identification of all the key landscape and visual receptors and analysis of the sensitivity of each of these receptors to the Proposed Development.

## **Assessment of Effects**

### ***Identification of Landscape and Visual Effects***

The impact assessment aims to identify all the potential landscape, visual and cumulative effects of the Proposed Development taking account of any proposed mitigation measures. This is carried out by:

- assessing the magnitude of change brought about by the Proposed Development on each of the receptors identified in the baseline review;
- the effect is then predicted by combining the sensitivity of the receptor (as identified in the baseline review) with the magnitude of change; and
- lastly, the significance of the predicted effect is assessed in a logical and well-reasoned fashion.

The assessment aims to describe the changes in the character and the landscape resources that are expected to result from the Proposed Development. It covers both landscape effects (changes in the

fabric, character and key defining characteristics of the landscape), and the visual effects (changes in available views of the landscape and the significance of those changes on people).

Table 2 below identifies potential landscape and visual effects. Potential effects are those that could result from the construction and operation of the Proposed Development, according to the project, site and receptor characteristics and their interactions. The inclusion of a potential effect in Table 2 does not imply that this will occur, or be significant. The assessment is based upon an assessment of the potential effects, in order to identify predicted effects.

**Table 2 – Potential Landscape and Visual Effects**

<b>Activity</b>	<b>Specific Element</b>	<b>Potential Effects</b>	<b>Potential Sensitive Receptors</b>
Construction	Construction plant, temporary construction compound, vehicle movements	Temporary effect on landscape fabric; Temporary impacts on visual amenity	Landscapes character types; Designated landscapes; Gardens and designed landscapes; Visual receptors: Residents, visitors, tourists, road users, walkers, cyclists
Operation	Presence of tracks, turbines, permanent site compound and substation	Long term but reversible impacts on landscape fabric. Long term but reversible impacts on visual amenity Cumulative impacts with other wind farms	Landscapes character types; Designated landscapes; Gardens and designed landscapes; Visual receptors: Residents, visitors, tourists, road users, walkers, cyclists
Decommission	Construction plant, temporary compound, vehicle movements	Temporary impacts on landscape fabric. Temporary impacts on visual amenity	Landscapes character types; Designated landscapes; Gardens and designed landscapes; Visual receptors: Residents, visitors, tourists, road users, walkers, cyclists

### **Zone of Theoretical Visibility**

Identification of landscape and visual receptors which may be affected by the proposed development was undertaken using a ZTV to identify where the Proposed Development will be theoretically visible.

Following consultation, a 35 km radius study area has been agreed. This is in line with current SNH guidance relating to turbines sizes. ZTV mapping was produced to identify the potential visibility pattern of the proposed Development within the study area. The ZTVs were modelled using a computer based visibility analysis package, compiled using Ordnance Survey digital height data, and a three dimensional digital model of the proposal.

The ZTVs of the Proposed Development are illustrated in Figures 6.2 – 6.5, and include a 35 km radius ZTV and a more detailed 15 km radius ZTV based on the visibility to the blade tips of the rotor blades on the turbines and to the hub height of the turbines.

The ZTVs are digital models and they assume a “worst case visibility scenario” in that they assume a bare land surface and take no account of vegetation, local variations in topography or the presence of walls, buildings, hedgerows and other such objects which can substantially reduce visibility from that predicted by the ZTVs. The ZTVs do not account for atmospheric conditions such as haze, fog, rain, and duration of sunlight hours, which may substantially reduce visibility for extended periods. The

assessment has been based on the blade tip ZTVs, which means that they indicate all parts of the study area where some part of one or more turbines may be visible. Where the ZTV indicates that there is no visibility of turbines, this may be considered accurate.

A visibility assessment has been carried out to describe the visibility pattern of the Proposed Development within the study area. The visibility assessment concentrated upon accessible locations including roads, footpaths, residential areas and popular recreation sites which have views of the Proposed Development, as indicated by the ZTV and checked on site.

### **Wireframes and Photomontages**

The assessment has also involved the production of computer generated wireframes to predict and illustrate views of the proposed turbines from each of the representative viewpoints. Photomontages of some of these viewpoints have also been prepared. These visualisations are prepared in accordance with SNH guidance, Visual Representation of Wind Farms, Scottish Natural Heritage, Version 2.2, February 2017.

### **Scoping of Landscape and Visual Receptors**

As described above, the identification of landscape and visual receptors which may be affected by the Proposed Development was undertaken by interrogating the ZTV figures. Where a receptor was found to have no theoretical visibility of the Proposed Development, it was not considered further within the LVIA Chapter. This is due to the fact that where a receptor has no theoretical visibility of the Proposed Development there will be no impact.

For some receptors the ZTV figures indicate a single or several small amounts of theoretical visibility. In these instances, the receptor is assessed further to determine whether other elements may contain or screen these small areas of potential visibility. Some parts of the study area contains a large amount of tree cover, and combined with a locally complex landform, potential visibility can be significantly reduced or screened entirely. This has also been verified by site visits. Where a receptor is scoped out, it is stated in the baseline with an explanation as to why the receptor is not considered further.

### ***Landscape Sensitivity and Magnitude of Change***

The aim of the Environmental Impact Assessment is to identify and evaluate potential effects arising from a Proposed Development. Wherever possible identified effects are quantified, however the nature of LVIA requires interpretation by professional judgement.

In order to provide a level of consistency to the assessment, criteria for the prediction of magnitude and assessment of significance of the residual landscape and visual effects have been defined.

The sensitivity of a landscape receptor is an expression of the value: in terms of any designations that may apply, or in terms of scenic quality, sense of place, and rarity, and the experience of the landscape in relation to perceptual responses, cultural associations, its recreational value and other values such as nature conservation; and, its susceptibility to change: its ability to accommodate the changes that would occur as a result of the addition of the proposed development.

Considerations include: the specific nature of the proposed development, its size, scale, location and characteristics; the degree to which the receptor may accommodate the influence of the proposed development; and, the extent to which the proposed development would influence the character of the landscape receptors.

**Table 3 – Definition of Landscape Receptor Sensitivity**

Sensitivity	Definition
High	Little to no opportunity for the accommodation of change without undue consequences on the baseline environment; the landscape contains components which are highly valued by a wide range of people or has national importance in terms of any designations that may apply.
Medium	Some opportunity for the accommodation of change without undue consequences on the baseline environment; the landscape contains components which are moderately valued by a range of people or has regional/local importance in terms of any designations that may apply.
Low	There are opportunities for the accommodation of change without undue consequences on the baseline environment; the landscape contains few valued components or has no importance in terms of any designations that may apply.

The wind farm landscape capacity studies for each Council administrative area includes a detailed sensitivity assessment of each landscape character type or area /unit within each administrative area. Different ratings are applied to each of the different development typologies. Each of the Councils have adopted the studies as supplementary guidance. Dumfries and Galloway Council have adopted the Dumfries and Galloway Wind Farm Landscape Capacity Study as statutory supplementary guidance, and therefore forms part of the development plan. For this reason, the sensitivity ratings identified within this study have been applied in this LVIA.

The ratings identified within each of the capacity studies relating to the 'large typology' (turbines 80-150m high) have been utilised within the LVIA. The LVIA submitted in 2015 did not utilise the sensitivity ratings in the DGWLCS; rather a different methodology was used which resulted in lower sensitivity ratings for a number of landscape character types or areas /units within the study area.

As detailed within each capacity study, an overall landscape and visual sensitivity rating is provided by considering a set of key landscape and visual criteria. The following list is the sensitivity criteria used:

- Landscape scale;
- Landform;
- Land cover pattern;
- Settlement and archaeology;
- Perceptual qualities;
- Landscape context;
- Views and visibility;
- Cumulative effects; and,
- Landscape values.

The capacity studies score each of the sensitivity criterion listed above using a five point scale. To provide an overall landscape and visual sensitivity rating a combined weight of this numerical scoring system and professional judgement is considered. Overall sensitivity ratings are defined as High, High-Medium, Medium, Medium-Low and Low. The following table provides an explanation of the sensitivity ratings. This table is contained within each of the capacity studies used in this LVIA.

**Table 4 – Explanation of Sensitivity Ratings of Landscape Character**

Overall Sensitivity Rating	Definition
Low	The development typology relates well to key landscape characteristics and change is able to be accommodated without significant adverse impacts on landscape character or visual amenity.
Medium-Low	Some limited sensitivities although there are opportunities to accommodate the development typology in most locations.
Medium	Some key landscape characteristics or aspects of visual amenity are sensitive but there is still some ability to accommodate development in some situations without out significant character change or visual impact; the development typology relates to some aspects of landscape character.
High-Medium	A number of key landscape characteristics are vulnerable to change. Development would undermine some important defining aspects of landscape character and/or visual amenity and/or may result in significant cumulative effects with other wind farm developments. A limited amount of development may be able to be accommodated in very small parts of some landscape character types/areas however.
High	The majority of all of the key landscape characteristics are vulnerable to change. Development would conflict with key aspects of landscape character and visual amenity with widespread and significant adverse impacts likely to arise.

As every development and its interaction with the landscape is unique, there will be situations where predefined criteria will not accurately reflect the potential residual effects. In such cases, professional judgement takes precedence and is explained in the text.

The criteria used for understanding the magnitude of landscape change are summarised below.

**Table 5 – Definition of Landscape Magnitude of Change**

Level of Magnitude	Definition of Magnitude
High	Total loss or major alteration to key elements, features or characteristics of the baseline landscape so that the post development character and composition of the baseline landscape resource will be fundamentally changed.
Medium	Partial loss or alteration to one or more key elements, features or characteristics of the baseline landscape so that the post development character and composition of the baseline landscape resource will be partially, but noticeably changed.
Low	Minor loss of or to one or more key elements, features or characteristics of the baseline landscape so that the post development character and composition of the baseline landscape resource will be noticeably changed but the underlying character of the baseline landscape will be similar to the pre-development character.
Negligible	Very minor loss or alteration to one or more key elements, features or characteristics of the baseline landscape. Change to the landscape character will be barely distinguishable. No discernible effect upon the view

### ***Visual Receptor Sensitivity and Magnitude of Change***

The sensitivity of visual receptors is determined by a combination of the value of the view and the susceptibility of the visual receptor to change. The value of the view is a reflection of the importance attached either formally through planning designations or informally through the value which society attaches to a view. Susceptibility to change takes into account the nature of the viewer experiencing

the view and how susceptible they are to the potential effects of the proposed development. Professional judgement is used and based upon:

- the occupation or activity of the receptor, such as relaxing at home, taking part in leisure, recreational and sporting activities, travelling or working;
- the principal visual characteristics and features which define the view;
- the experience of the viewer and the extent to which their focus is directed toward the view, the duration of the view, frequency (whether receptors will be exposed to the change daily, frequently, occasionally or rarely), and whether the view is static or transitory.

Visual receptor sensitivity is defined as High, Medium, Low or Negligible.

**Table 6 – Definition of Visual Receptor Sensitivity**

Sensitivity	Definition
High	Users of outdoor recreational facilities including strategic recreational footpaths, cycle routes or rights of way, whose attention may be focused on the landscape; important landscape features with physical, cultural or historic attributes; views from principal settlements; visitors to beauty spots and picnic areas.
Medium	Other footpaths; people travelling through or past the landscape on roads, train lines or other transport routes; views from passenger ferries and cruisers, views from minor settlements.
Low	People engaged in outdoor sports or recreation (other than appreciation of the landscape), and those whose attention may be focused on their work or activity rather than the wider landscape.
Negligible	Views from heavily industrialised areas or where direct views of the development are severely restricted and/or distant.

In practice, a location may have different levels of sensitivity, according to the different receptors at that location. The sensitivity of any one group of receptors may also be different at different locations. The specific combinations of factors that have influenced the judgement of sensitivity are described in the viewpoint baseline text.

The sensitivity of residential settlements is different from all other visual receptors. This is because the sensitivity of any settlement to the Proposed Development is dependent on the orientation of the main living areas of individual dwellings. Where several dwellings are orientated in the same way, these are grouped together and considered as one receptor. For the purposes of this assessment, the general orientation of the settlements has been ascertained as far as possible by onsite survey, in combination with desk top exercise. The sensitivity of the settlements is judged correspondingly, via the criteria outlined below:

**Table 7 – Definition of Sensitivity of Residential Settlements**

Sensitivity	Definition
High	Direct and semi-direct views of the Proposed Development from the main living room are available or may be possible.
Medium	Oblique views of the Proposed Development from the main living room are available or may be possible.
Low	Very oblique views of the Proposed Development are available or may be possible from the main living room.
Negligible	Oblique or very oblique views of the Proposed Development may be possible from the main living room, which are further limited by filtering and/or screening provided by intervening objects (e.g. trees/ man-made structures etc).

The magnitude of visual change arising from the Proposed Development for all visual receptors including settlements is described as High, Medium, Low or Negligible based on the overall extent of visibility. For individual viewpoints it will depend upon the combination of a range of factors:

- the distance of the viewpoint from the Proposed Development;
- the duration and reversibility of the effect;
- extent of the Proposed Development visible from the viewpoint (number and parts of turbines visible);
- the angle of view in relation to main receptor activity;
- the proportion of the field of view occupied by the Proposed Development;
- the background to the Proposed Development; and
- the scale and character of the context within which the proposed development would be seen, as this would determine the degree to which the proposed development can be accommodated in the existing outlook. The scale of landform, buildings, vegetation features, patterns of the landscape, existing land use and the type and form of development seen in the baseline view would all be relevant.

**Table 8 – Definition of Visual Magnitude of Change**

Level of Magnitude	Description of Change	Definition of Magnitude
High	Dominant	Highly noticeable change, affecting most key characteristics and dominating the experience of the landscape. The introduction of incongruous development. A high proportion of the view is affected.
Medium	Conspicuous	Noticeable, partial change to a proportion of the landscape, affecting some key characteristics and the experience of the landscape. The introduction of some uncharacteristic elements. Some of the view is affected.
Low	Apparent	Minor change, affecting some characteristics and the experience of the landscape to an extent. The introduction of elements which are not uncharacteristic. Little of the view is affected.
Negligible	Inconspicuous	Little perceptible change. No discernible effect upon the view.

Other factors may also influence the visual effect. These relate to both human perception and to the physical environment itself. Factors which tend to reduce the apparent magnitude include the following:

- sky-lining of front-lit turbines (where turbines are seen against the sky and the sun is behind the viewer, thus turbines reflect light and blend more easily into the brightness of the sky);
- landform backdrop to back-lit turbines (where turbines are back-clothed by landform and the viewer sees them silhouetted with the light behind them. in this scenario the turbines are more likely to blend into the landscape);
- an absence of visual clues;
- turbines do not form the focal point of the view;
- a complex and varied scene; and
- high relative elevation of view.

Factors which tend to increase the apparent magnitude include the following:

- back-grounding of turbines (where turbines are seen against a backcloth of land);
- visual clues;
- turbines form the focal point of the view;
- a simple scene; and
- low relative elevation of view.

### ***Significance of Effects on Landscape and Visual Receptors***

The significance of any identified landscape or visual effect has been assessed as Major, Moderate, Minor or Negligible effect. These categories have been determined by consideration of viewpoint or landscape sensitivity and predicted magnitude of change as described above, with Table 8 used as a guide to correlating sensitivity and magnitude of change to determine significance of effects. It should be noted that this is a guide only, and there will be times when the combination of sensitivity and magnitude yield a slightly different result from that predicted by the table. Where there is a discrepancy, it is explained in the text.

**Table 9 - Correlation of Sensitivity and Magnitude of Effect to Determine the Significance of Effects**

Sensitivity of Receptor	Magnitude of Change			
	High	Medium	Low	Negligible
High	Major	Major-Moderate	Moderate	Negligible
Medium	Major-Moderate	Moderate	Moderate-Minor	Negligible
Low	Moderate	Moderate-Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	None

When the overall effect is predicted to be Major or Major-Moderate this is considered to be a Significant effect, as referred to in the EIA Regulations. Significant effects may in some circumstances not be necessarily negative and may be reversible. The combination of sensitivity and magnitude of change occasionally results in a Moderate effect, which using the correlation table is a Significant effect. However, in certain circumstances, professional judgement may deem that overall, the effect is Not Significant. This can occur where a Significant is experienced over a small part of an extensive proportion. A Significant effect from an individual static viewpoint can still be assessed within an area which does not necessarily experience a Significant effect. Where a Moderate effect is classed as Not Significant, an explanation as to why is provided in the assessment.

This matrix is not used as a prescriptive tool, and the methodology and analysis of potential effects at any particular location must take account of professional judgement, therefore in some situations the analysis may not reflect the effects predicted by the grid.

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