

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Environmental Statement

Volume 4, Annex 10.4: Seascape, landscape and visual resources impact assessment methodology

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MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

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Glossary

Term	Meaning
Access Land	Land designated as open access as defined in the Countryside and Rights of Way Act 2000 (the CRoW Act)
Characteristics	Landscape features and elements, or combinations of elements, which make a contribution to distinctive landscape character.
Designated landscapes	Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.
Elements	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.
Feature	Prominent elements in the landscape, such as tree clumps, church towers or wooded skylines.
Green infrastructure	Networks of green spaces and watercourses and water bodies that connect rural areas, villages, towns and cities.
Heritage	The historic environment and especially valued assets and qualities, such as historic buildings and cultural traditions.
Key characteristics	Elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical processes.
Landscape	An area, as perceived by people, the character of which is a result of the action and interaction of natural and/or human factors.
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Areas	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscape distinctive. The process results in the production of a Landscape Character Assessment.
Landscape Character Type	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historical land use, and settlement pattern.
Landscape effects	Effects on the landscape as a resource in its own right.
Landscape quality (condition)	A measure of physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape receptors	Defined aspects of the landscape resource that have the potential to be affected by the proposal.
Landscape value	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons

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Term	Meaning
Magnitude (of impact)	A term that combines judgements about the size and scale of the impact or change, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs of the existing landscape.
Seascape	The visual and physical conjunction of land and sea which combines maritime, coast and hinterland character.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Significance (of effect)	A judgement of the environmental effect resulting from a combination of the sensitivity of the receptor and the magnitude of the impact of a proposed development.
Special Qualities	A term usually used in relation to National Parks or Areas of Outstanding Natural Beauty. It is given to those qualities for which the area is designated.
Susceptibility	The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.
Tranquillity	A state of calm and quietude associated with peace, considered to be a significant feature in the landscape.
Visual amenity	The overall pleasantness of the views people enjoy in their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Visual effects	Effects on specific views and on general visual amenity experienced by people.
Visual receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visualisation	A computer simulation, photomontage or other technique illustrating the predicted appearance of a proposed development.
Zone of Theoretical Visibility	A map, usually digitally produced, showing areas of land within which, a development is theoretically visible.

Acronyms

Acronym	Description
AOD	Above Ordnance Datum
BOD	Below Ordnance Datum
CEA	Cumulative Effect Assessment
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
FoV	Field of View
GLVIA	Guidelines for Landscape and Visual Impact Assessment
HFoV	Horizontal Field of View

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Acronym	Description
IEMA	Institute of Environmental Management and Assessment
LAT	Lowest Astronomical Tide
MCA	Marine Character Area
MDS	Maximum Design Scenario
NCA	National Character Area
NL	National Landscape
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
OS	Ordnance Survey
OSP	Offshore Substation Platform
PEIR	Preliminary Environmental Information Report
SLVIA	Seascape, Landscape and Visual Impact Assessment
SSZ	Seascape Sensitivity Zone
TGN	Technical Guidance Note
ZTV	Zone of Theoretical Visibility

Units

Unit	Description
Km	Kilometres
m	Metres
mm	Millimetre
°	Degree
%	Percentage

1 Seascape, landscape and visual resources impact assessment methodology

1.1 Introduction

1.1.1.1 This technical report annex describes the methodology used to undertake the seascape, landscape and visual impact assessment (SLVIA), including the collection of baseline information and the assessment of likely significant effects, contained in Environmental Statement Volume 2, Chapter 10: Seascape, landscape and visual resources of the Environmental Statement.

1.2 Study area

1.2.1.1 The Morgan Offshore Wind Project: Generation Assets (hereafter referred to as Morgan Generation Assets). Project SLVIA study area (hereafter referred to as 'the SLVIA study area') is illustrated in Figure 1.1. The SLVIA study area has been based on the findings of an analysis of the Zone of Theoretical Visibility (ZTV).

1.2.1.2 The SLVIA study area comprises the area of sea to be temporarily and permanently occupied during construction, operations and maintenance, and decommissioning of the Morgan Generation Assets and is based on a 50 km buffer from the Morgan Array Area. This distance threshold aligns with recommendations set out in section 9.19 of the White Consultants report for Natural Resources Wales (NRW) 'Seascape and Visual Buffer Study for Offshore Wind Farms' (NRW, 2020).

1.2.1.3 As the SLVIA study area extends into both England and Isle of Man, both English and Isle of Man planning policies relevant to the SLVIA have been referenced in this technical report, where appropriate. The 50 km SLVIA study area includes English, Isle of Man and Welsh territorial waters.

1.2.1.4 The SLVIA Cumulative Effects Assessment (CEA) study areas extend to:

- 85 km from the edge of the Morgan Array Area to capture existing and proposed onshore windfarms
- 100 km from the edge of the Morgan Array Area to capture existing and proposed offshore windfarms.

1.2.1.5 The CEA study areas identified above are illustrated within Figure 1.2.

1.2.1.6 The buffers used to define the seascape, landscape and visual resources study areas are based on the Maximum Design Scenario (MDS) set out in Volume 2, Chapter 10: Seascape, landscape and visual resources of the Environmental Statement.

1.2.1.7 In consultation, Natural England recommended an SLVIA study area of 60 km. This recommendation has been accepted and in nationally and internationally designated landscapes the SLVIA study area has been extended to 60 km. The effects on the special qualities of these designated landscapes are assessed in Volume 4, annex 10.5: Internationally and nationally designated landscape study of the Environmental Statement.

1.2.1.8 The extended 60 km SLVIA study area overlaps a very small part of the Isle of Anglesey National Landscape. Due to distance and the small amount of the National Landscape (NL) included within the 60 km there is no potential for significant effects to be experienced by this landscape and so it has not been taken forward to assessment.

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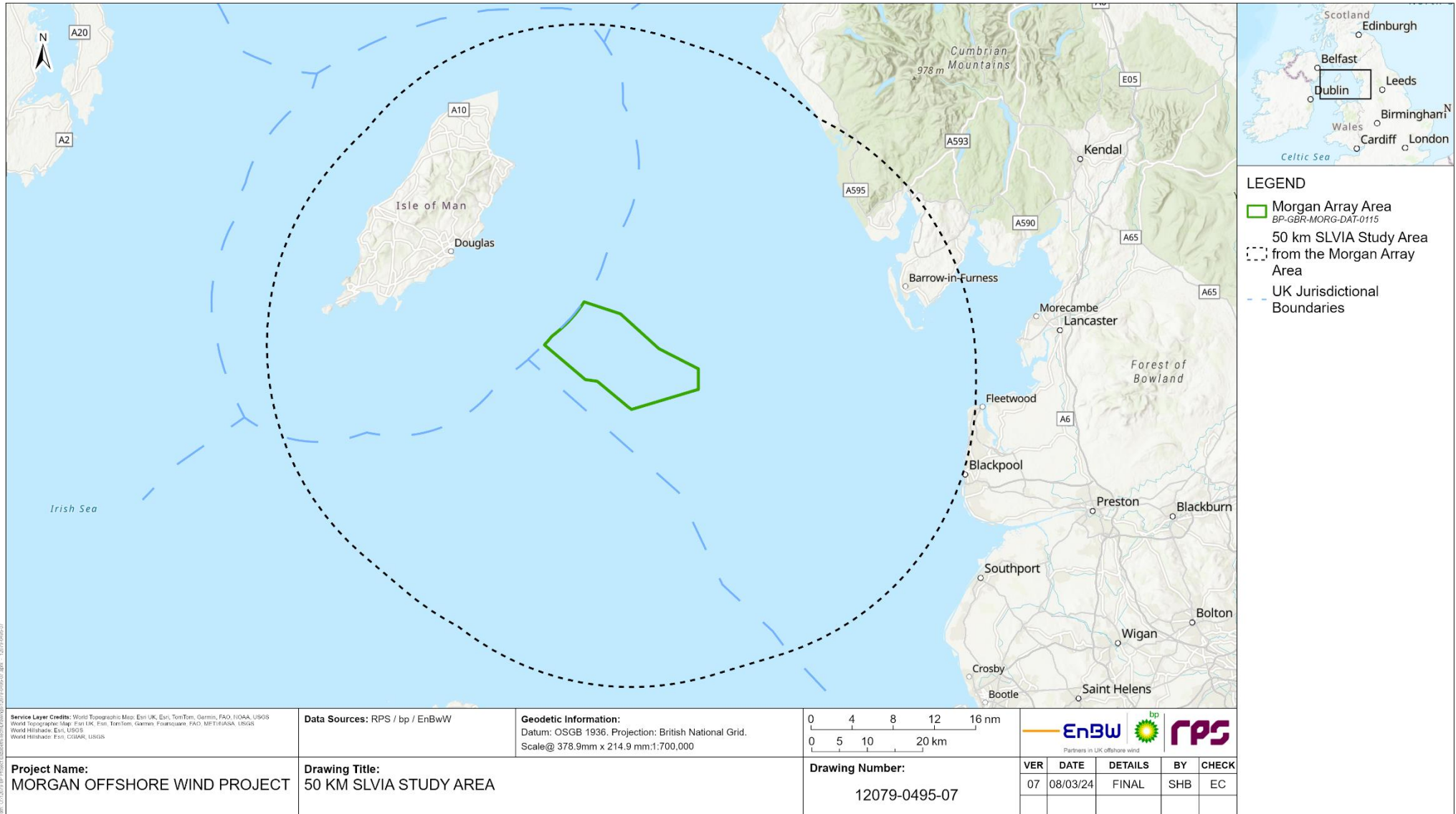


Figure 1.1: SLVIA study area.

1.3 Consultation

1.3.1.1 In line with best practice guidance in *Guidelines for Landscape and Visual Impact Assessment: Third edition* (GLVIA3) (Landscape Institute and Institute of Environmental Management and Assessment (IEMA, 2013) (engaging with stakeholders and the public, page 43, paragraphs 3.40 to 3.45), the scope and methodology of the SLVIA has been the subject of engagement and consultations with the relevant planning authorities, statutory bodies and other parties, and the public.

1.3.1.2 Details of the consultees and others engaged, and consultations undertaken to date, together with a summary of the key matters raised by the parties pertinent to SLVIA, are set out in the Environmental Statement as follows:

- Volume 2, Chapter 10: Seascape, landscape and visual resources of the Environmental Statement
- Volume 4, Annex 10.3: Visual baseline technical report of the Environmental Statement.

1.4 Overview of SLVIA methodologies

1.4.1 Introduction

1.4.1.1 The SLVIA has been undertaken based on the guidance on landscape and visual impact assessment within the GLVIA3. In addition, the SLVIA has been informed by relevant best practice guidance including:

- Technical Guidance Note 02/21: Assessing landscape value outside national designations (Landscape Institute, 2021)
- Technical Guidance Note 06/19: Visual Representation of Development Proposals (Landscape Institute, 2019)
- Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report (Department of Trade and Industry, 2005).

Natural Resources Wales SLVIA guidance for offshore windfarms

1.4.1.2 The assessment methodology used in this SLVIA is based on GLVIA3 and the DTI (2005) guidance. The authors have also considered NRW's most recent guidance on offshore wind farms: Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance, Stage 1 – Ready reckoner of visual effects related to turbine size (NRW Report No. 315); Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance, Stage 2 – Guidance on siting offshore windfarms (NRW Report No. 330); and, Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance, Stage 3 – Seascape and visual sensitivity assessment for offshore wind farms (NRW Report No. 331) (2019, White, S. Michaels, S. King, H. White Consultants). An assessment of these documents has been made in paragraphs 1.4.1.3 to 1.4.1.13, below.

1.4.1.3 NRW Stage 1 report (NRW Report 315) paragraph 2.3 Findings, Table 1, summarises the magnitude of 'effect' (referred to as magnitude of 'impact' in GLVIA3 and henceforward in this annex) for a range of turbine heights. The magnitude of impact is measured in term of distance only, not in size/scale, geographical extent or duration and reversibility (as advised by GLVIA3 in paragraphs 5.48 to 5.52). It also does not take account of atmospheric conditions, such as haze, which the NRW Stage 2 report

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(NRW Report 330) acknowledges affects visibility over distance (page 14). Notwithstanding the above and using wireline images only (which over-emphasise the presence of wind turbines) NRW Report 315 summarises the impact of 301 to 350 high wind turbines as Medium at a distance of 32.8 km. The numeric results are presented in Table 1, which does not allow for professional judgement. This approach is not consistent with GLVIA3 or earlier, detailed guidance from the DTI. Its document *Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report* (DTI, 2005) provides the Scarweather Sands Evaluation of Seascape and Visual Impacts – Assessing Significance: Key Guidance, which explains that *‘There are no measurable, technical thresholds in SVIA, and as such the assessor must clearly define the criteria used in the assessment for each project, using his or her skill based on reasonable professional judgement’* (DTI report, page 81). The role of professional judgement is explicit in GLVIA3, *‘Professional judgement is a very important part of LVIA. While there is some scope for quantitative measurement of some relatively objective matters, for example the number of trees lost to construction’ ... ‘much of the assessment must rely on qualitative judgements , 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’* (paragraph 2.23). The Scarweather Sands guidance (repeated in DTI, 2005) notes that *‘In some instances the conclusions reached may not come out as the relationship in the matrix suggests because a particular parameter may be considered as having a determining effect on the analysis.’* NRW Report 315 refers to the IEMA guidance (2011). However, the IEMA guidance refers to all topics, including those more scientific-based subjects, not landscape and visual impact assessment specifically. GLVIA3 (2013) supersedes this more general guidance and provides specific guidance on landscape and visual matters.

- 1.4.1.4 NRW Report 315 states that there is the potential for significant effects even at low impact magnitudes, no explanation, or examples given. At a Medium impact magnitude NRW Report 315 states that there is a likelihood of significant effects (paragraph 2.3). This contrasts with the DTI 2005 document (see paragraph 1.4.1.7, below). However, the NRW Report 315 notes that Examining Authorities and Inspectors take the view that each case is considered on its own merit (paragraph 2.4) and that there are factors which reduce harm, which include existing, significant developments, such as coastal power stations and urban areas and offshore wind farms. NRW Report 315 erroneously lists Heritage Coasts as a nationally designated area (paragraph 5.3). Heritage Coast is neither a landscape or heritage designation of any level and should not be used to artificially enhance the sensitivity of an area.
- 1.4.1.5 NRW Report 315 refers to the DTI 2005 guidance and presents the DTI Table 5 – Magnitude of change (impact): names, descriptors and definitions (NRW Stage 1, page 24 and 25) commenting that it provides useful definitions.
- 1.4.1.6 The DTI guidance, Table 6 – Significance of effects, is similarly replicated on page 25 of NRW Report 315). However, a transcription error has been made in the NRW report, as the DTI document does not consider that the Moderate effect, that results from a Very Large magnitude of impact experienced by a Very low sensitivity receptor to be significant. Whereas NRW Report 315 states that this has the potential to be significant. Within DTI Table 6, Major and Major/Moderate effects are significant. A Moderate effect is potentially significant (the DTI report on page 80 explains that *‘Where seascape or visual effects is [sic] classified as moderate, it is most likely that the effect will not be significant, but it is feasible that it could be judged as significant, depending on the particular circumstances arising’*. One case of Moderate (see above)

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and all Moderate/Minor effects and below are not considered to be significant in the DTI report. Volume 2, Chapter 10: Seascape, landscape and visual resources of the Environmental Statement concurs with the DTI methodology, that moderate effects are most likely not significant. The DTI methodology notes that *'significant effects need not be unacceptable or necessarily negative and may be reversible.'*

- 1.4.1.7 NRW Report 330 acknowledges that GLVIA3 is the most up-to-date guidance on undertaking SLVIAs (paragraph 2.4). It sets out the key objectives of the NRW guidance at section 4 (page 10). These are to:
- 'Maintain the integrity and quality of landscape character within National Parks and Area of Outstanding Natural Beauty (AONBs)
 - Avoid, or at least minimise, significant effects on sensitive seascape and visual receptors.'
- 1.4.1.8 The onshore and offshore development components are not located within a nationally designated landscape.
- 1.4.1.9 NRW Report 330 presents a series of measures to avoid or minimise seascape and visual effects in Table 4.1, many repeated from *Guidance on the Assessment of the Impact of Offshore Windfarms – seascape and visual impact report* (DTI, 2005). NRW Report 330 notes at paragraph 2.5, that where the DTI publication and GLVIA3 provide conflicting guidance, GLVIA3 should be used, as it has the more up-to-date guidance.
- 1.4.1.10 The guidance within NRW Report 330 includes Heritage Coasts (paragraph 3.4) which is neither a landscape or a heritage designation and has no status (and therefore weight) in either SLVIA or heritage assessments. Paragraphs 3.5 and 3.6 of the NRW Report 330 refer to heritage and ecological designations. It is not part of SLVIA to assess the effects on non-landscape elements other than noting such features if relevant, for example, *'Assessment of the effects of development on historic aspects of the landscape must, however, be dealt with in the cultural heritage topic of an Environmental Impact Assessment (EIA) and not as part of the landscape and visual topic.'* (GLVIA3, page 93 Summary advice on good practice, fifth bullet point).
- 1.4.1.11 The NRW Stage 3 report (NRW Report 331) provides a methodology for assessing the sensitivity of seascapes. It does not provide separate definitions for seascape and visual sensitivity but combines the two. It also refers to the seascape as having visual sensitivity, whereas visual effects (based on visual sensitivity of the receptor and magnitude of impact) are always experienced by people, not seascapes (GLVIA3, paragraph 6.1). GLVIA3 is clear that LVIA/SLVIA is comprised of two distinct components:
1. *'Assessment of landscape effects: assessing effects on the landscape (or seascape) as a resource in its own right'*
 2. *'Assessment of visual effects on specific views and on the general visual amenity experienced by people.'* (GLVIA3, paragraph 2.21).
- 1.4.1.12 *'The distinction between these two aspects is very important but often misunderstood, even by professionals. LVIA must deal with both and should be clear about the difference between them.'* (GLVIA3, paragraph 2.22).
- 1.4.1.13 NRW Report 331 gives designated landscapes seascape 'settings', which appear to be based solely on distance from the designated landscape, 'clipped' to Welsh territorial waters (e.g. Figure 7) rather than taking the context of the landscape/seascape in which the visual receptor (a person, not a seascape) is viewing the seascape, for example, the elevation of the viewer. Figure 7 places artificial boundaries on the sea, whereas, in reality, there will be a gradation of sensitivity. The

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sensitivity levels given do not grade out, missing intermediate categories in some areas of the sea. Sensitivity is always to a particular development. Figure 7 does not specify the type (scale, height, etc.) of offshore wind farm development that the seascape is sensitive to. As such it cannot be used as a baseline for indicating the sensitivity of seascape to a particular wind farm development. The figure does not take into consideration the context of the designated landscapes, or the visual receptors (e.g. what other development is in the view). As reported before (paragraph 1.4.1.11) it combines seascape sensitivity with visual sensitivity, which is not the approach advocated in GLVIA3.

1.5 SLVIA assessment methodology for the Morgan Generation Assets

1.5.1 Overview

- 1.5.1.1 An overview of the SLVIA process set out in GLVIA3 is described in the following sections of this report. The SLVIA assesses the likely significant effects of the construction, operations and maintenance and decommissioning of the Morgan Generation Assets on the seascape, landscape and visual receptors, within the SLVIA study area.
- 1.5.1.2 GLVIA3 sets out the need to assess landscape and visual aspects separately, notwithstanding that they are related topics. The SLVIA follows the guidance recommendation in treating seascape/landscape and visual matters separately throughout the assessment.
- 1.5.1.3 GLVIA3 sets out broad guidelines rather than detailed prescriptive methodologies. The methodologies tailored for the assessment of the Morgan Generation Assets are based on GLVIA3 guidance, which recommends that an LVIA ‘*concentrates on principles and process*’ and ‘*does not provide a detailed or formulaic recipe*’ to assess effects, it being the ‘*responsibility of the professional to ensure that the approach and methodology are appropriate to the task in hand*’ (preface to GLVIA3).
- 1.5.1.4 Potential seascape, landscape and visual effects (the impact of the Morgan Generation Assets) are assessed by considering the amount or ‘magnitude’ of change/impact, compared with the baseline conditions, likely to be experienced by seascape and landscape character areas and visual receptors (people) as a result of implementing the Morgan Generation Assets. Magnitude is then weighed against the sensitivity (to the Morgan Generation Assets) of the seascape, landscape or visual receptor in question to arrive at a judgement on the level of effect. The sensitivity of a given receptor is assessed by considering both its inherent value and its susceptibility to the type of development proposed. Finally, a judgement is made on whether the predicted seascape, landscape or visual effect is likely to be significant or not significant.
- 1.5.1.5 Regarding establishing the SLVIA baseline, in accordance with GLVIA3 (paragraph 7.13) and Planning Inspectorate Advice Note 17: Cumulative Effects Assessment (The Planning Inspectorate, 2019) existing active/in operation development is considered as part of the baseline conditions. As such, this SLVIA is an assessment of the likely seascape, landscape and visual effects of the Morgan Generation Assets set within its existing seascape, landscape and visual context, one which already contains operational wind farms, other infrastructure, and associated activities.
- 1.5.1.6 The assessment methodology is summarised in Figure 1.3. These factors are determined through a combination of quantitative (objective) and qualitative (subjective) assessment using professional judgement.

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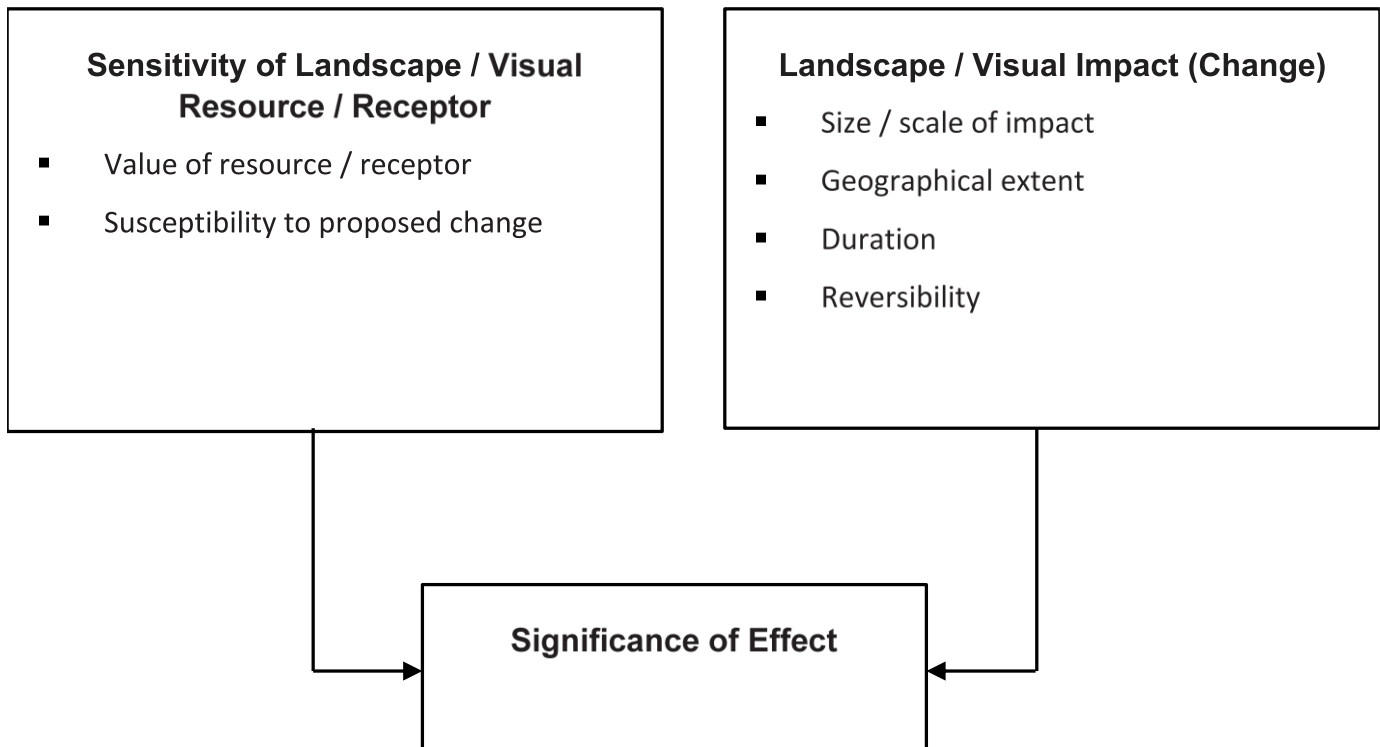


Figure 1.3: Assessment method summary

1.5.1.7 The guidance emphasises the need for all assessments to be clear and transparent. It encourages the use of a simplified matrix of significance and warns against the use of other topics’ significance criteria. The guidance also warns against reliance on significance tables alone, the emphasis should be on well-argued narrative text, for clarity and transparency.

1.5.2 Significance and proportionality

1.5.2.1 The purpose of carrying out this SLVIA is to identify and assess the significant effects likely to arise from the implementing the proposed development in question. Chapter 1: Introduction of GLVIA3 best practice guidance states:

‘Identifying significant effects stresses the need for an approach that is in proportion to the scale of the project that is being assessed and the nature of its likely effects. Judgement needs to be exercised at all stages in terms of the scale of investigation that is appropriate and proportional. This does not mean that effects should be ignored, or their importance minimised but that the assessment should be tailored to the particular circumstances in each case’ (paragraph 1.17).

1.5.2.2 This SLVIA and its findings and conclusions are steered by the proportionality principle expressed in the paragraph quoted above.

1.5.2.3 When judging the overall significance of effect, GLVIA3 reiterates the need to clearly distinguish between effects which are significant and those which are not. It explains that there are no hard or fast rules about what effects should be deemed to be significant. The SLVIA method used in the assessment of the project takes the DTI approach, which is that *‘Where seascape or visual effects is [sic] classified as moderate, it is most likely that the effect will not be significant, but it is feasible that it could be judged as significant, depending on the particular circumstances arising’ (paragraph 1.4.1.7, above).*

1.5.3 Assumptions and limitations

1.5.3.1 The SLVIA is subject to the following assumptions and limitations:

- The visual assessment is based on analysis of Ordnance Survey (OS) mapping of the Morgan Generation Assets and surrounding area, and on field survey and analysis of views from publicly accessible viewpoints in the surrounding landscape and ferry routes. Although every effort has been made to include viewpoints in sensitive locations and locations from which the Morgan Generation Assets would be most visible, not all public viewpoints from which the Morgan Generation Assets would potentially be seen have necessarily been included in the assessment
- The fieldwork was undertaken during early spring when deciduous trees were not in leaf and late summer 2022 and following statutory consultation on the Preliminary Environmental Information Report (PEIR) in August and September 2023 when deciduous trees were in leaf and also during the period December 2023 to January and March 2024. The early spring photography has allowed an accurate projection of the MDS (i.e. the most visible conditions). However, visibility in some months can be more limited due to weather conditions (see Appendix B). Judgements have necessarily been made regarding the summer situation when vegetation is in full leaf for some of the locations
- The term ‘host’ landscape/seascape is understood to mean the seascape/landscape character unit in which the Morgan Generation Assets is located. In other words, the seascape/landscape character unit that is ‘hosting’ the proposed development
- The Morgan Generation Assets is treated as a permanent form of development that will be decommissioned after 35 years
- A ‘defining’ change is understood to mean one that substantially and/or materially alters the existing situation. In this SLVIA, a ‘defining’ change to the existing seascape/landscape or visual resource will typically lead to a significant effect being recorded, whereas a ‘non-defining’ change will not
- Assumptions and limitations relating to the visualisations and graphics production generally are set out in Appendix A.1: Visual representations.

1.6 Iterative assessment and design

1.6.1 Overview

1.6.1.1 As described in Volume 1, Chapter 5: Environmental impact assessment methodology of the Environmental Statement, the SLVIA is part of an ongoing iterative design process which aims to *‘avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment’*. This iterative approach involves a feedback loop whereby if the initial assessment of a potential seascape/landscape and/or visual effect is deemed likely to result in a significant adverse effect in EIA terms, changes to the Morgan Generation Assets MDS are made (where reasonably practical) to avoid, reduce or offset this. The assessment is then repeated, and the process continues until the effect has been reduced to a level that is judged to be not significant in EIA terms or, having regard to other constraints, no further changes may be made to the Morgan Generation Assets MDS in order to reduce the magnitude of impact (and hence its potential seascape, landscape and visual significance of effect).

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In such cases an overall effect that is still significant may be presented in the SLVIA section of the Environmental Statement.

- 1.6.1.2 This iterative design process has been used to inform the design of the Morgan Generation Assets through the identification of likely significant seascape/landscape and/or visual effects, and (where possible within operation constraints) the development of mitigation measures to address these. Where practical, these measures have been incorporated into the design of the Morgan Generation Assets MDS. They are referred to throughout the Environmental Statement as ‘measures adopted as part of the Morgan Generation Assets’.

1.6.2 Potential effects during construction and decommissioning

- 1.6.2.1 Potential effects on seascape character, landscape character and views/visual amenity that may occur during the construction and decommissioning phases of the Morgan Generation Assets include the following:

- Seascape effects:
 - Potential direct and indirect effects on seascape character. For example, installation of the wind turbines and Offshore Substation Platforms (OSPs) within the Morgan Array Area, which may alter the seascape character within the Morgan Array Area and/or the perceived character of the wider seascape, through the ability of people to see these changes within views
- Landscape effects:
 - Potential direct and indirect effects on landscape character. For example, the installation of the wind turbines and OSPs within the Morgan Array Area which may alter the perceived character of the wider landscape, through the ability of people to see these changes within views
 - Potential indirect effects on the special landscape qualities and integrity of designated landscapes. For example, construction and decommissioning of the offshore infrastructure may alter the special qualities and integrity of the Lake District National Park and the attributes of outstanding universal value of the English Lake District World Heritage Site
- Visual effects:
 - Potential direct effects on views and visual amenity experienced by people. For example, installation of the wind turbines and OSPs.

1.6.3 Potential effects during operations and maintenance

- 1.6.3.1 Potential effects on the seascape, landscape and views/visual amenity that may occur during the operations and maintenance phase of the Morgan Generation Assets, include the following:

- Seascape effects:
 - Potential direct and indirect effects on seascape character, which may arise as a result of the operation of the wind turbines, operations and maintenance activities located within the Morgan Array Area, which may alter the seascape character of the Morgan Array Area itself and/or the perceived character of the wider seascape through the ability of people to see these changes within views
- Landscape effects:

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- Potential direct and indirect effects on seascape and landscape character (including designated landscapes), arising as a result of the operation of the wind turbines, offshore substations and maintenance activities
- Potential indirect effects on the special landscape qualities and integrity of designated landscapes. For example, operations and maintenance of the offshore infrastructure may alter the special qualities and integrity of the Lake District National Park and the attributes of outstanding universal value of the English Lake District World Heritage Site
- Visual effects:
 - Potential direct effects on views and visual amenity experienced by people, which may arise as a result of the operation and maintenance phase of the wind turbines and OSPs, including marine navigation and aviation lighting
- Cumulative effects:
 - The assessment also considers the potential direct and indirect cumulative effects between the Morgan Generation Assets and other plans/projects, which are likely to result in additional changes to seascape character, landscape character and views/visual.

1.7 Guidance, data sources and site surveys

1.7.1 Guidance

1.7.1.1

As well as relevant planning policy and guidance summarised in Volume 2, Chapter 10: Seascape, landscape and visual resources of the Environmental Statement and detailed in Volume 4, Annex 10.1: Seascape, landscape and visual resources legislation and planning policy context of the Environmental Statement, the methodology used for the SLVIA has regard to relevant guidance and requirements contained in published documents, including in the following:

- Council of Europe, The European Landscape Convention (2000, ratified 2006) ETS No. 176
- Countryside Agency and Scottish Natural Heritage (2004), Topic Paper 6: Techniques and Criteria for judging Capacity and Sensitivity
- Department for Energy Security and Net Zero (2023a), Overarching National Policy Statement for Energy (EN-1)
- Department for Energy Security and Net Zero (2023b), National Policy Statement for Renewable Energy (EN-3)
- Department for Energy Security and Net Zero (2023c), National Policy Statement for Electricity Networks Infrastructure (EN-5)
- Department of Trade and Industry, (2005), Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report
- Department of Trade and Industry, BMT Cordah (2003), Offshore Wind Energy Generation: Phase 1 Proposals and Environment Report
- Hill M., Briggs J., Minto P., Bagnall D., Foley K., Williams A., (2001), INTERREG Report No. 5: Guide to Best Practice in Seascape Assessment
- Landscape Institute (2019). Visual Representation of Development Proposals

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- Natural England, (2012), An Approach to Seascape Character Assessment (Natural England, 2012)
- Natural England (2014), An Approach to Landscape Character Assessment (Natural England, 2014)
- Natural England (2022) Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications. Version 1.1. 79 pp.
- NatureScot (2022). Assessing the Cumulative Landscape and Visual Impacts of Onshore Wind Energy Developments
- NatureScot (2017). Visual Representation of Wind farms, Guidance (Version 2.2)
- Parker, J., Banks, A., Fawcett, A., Axelsson, M., Rowell, H., Allen, S., Ludgate, C., Humphrey, O., Baker, A. & Copley, V. (2022a). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards.
- Various (2021), Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards – Phase III: Expectations for Data Analysis and Presentation at Examination for Offshore Wind Applications – Draft Report
- White S., Michaels S., King H., (2019), Seascape and Visual Sensitivity to Offshore Wind Farms in Wales: Strategic Assessment and Guidance – Stage 1. Ready Reckoner of Visual Effects Related to Turbine Size (NRW Report No. 315)
- White S., Michaels S., King H. (2019), Seascape and Visual Sensitivity to Offshore Wind Farms in Wales: Strategic Assessment and Guidance – Stage 2. Guidance on Siting Offshore Wind Farms (NRW Report No. 330)
- White S., Michaels S., King H. (2019), Seascape and Visual Sensitivity to Offshore Wind Farms in Wales: Strategic Assessment and Guidance – Stage 3. Strategic Assessment and Guidance (NRW Report No. 331).

1.7.2 Data sources

1.7.2.1 The data sources that have been collected and used to inform this SLVIA are summarised in Table 1.1 below.

Table 1.1: Data sources used to inform the SLVIA.

Title	Source	Year	Author
Isle of Man Landscape Character Assessment	Isle of Man Government	2008	Chris Blandford Associates
(2016 to 2019) National Character Area Profile	Natural England Website http://publications.naturalengland.org.uk/	Various (2014)	Natural England
Marine Plan Areas in England	Marine Management Organisation	2014	Marine Management Organisation
National Seascape Assessment for Wales	Natural Resources Wales	2015	Land Use Consultants

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Title	Source	Year	Author
Seascape Character Assessment for the North West Inshore and Offshore Marine Plan Areas	Marine Management Organisation	2018	Land Use Consultants
Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance – Stage 3, Report No. 331	Natural Resources Wales	2019	White, S. Michaels, S. King, H.
Welsh National Marine Plan	Welsh Government	2019	Welsh Government

1.7.3 Desk-based studies and site survey work

1.7.3.1 The SLVIA has been informed by desk-based studies, stakeholder consultations and field survey work undertaken as set out Volume 4, Annex 10.3: Visual baseline technical report of the Environmental Statement.

1.8 Assessment of visual effects

1.8.1 Introduction

1.8.1.1 Visual effects are concerned with effects on views and visual amenity, defined as ‘*the overall pleasantness of the views people enjoy of their surroundings...*’ (GLVIA3, page 158). They relate to the effects on views experienced by visual receptors (e.g. footpath users, road users, people in their places of work).

1.8.1.2 Visual receptors are always people: ‘*An assessment of visual effects deals with the effects of change and development on the views available to people and their visual amenity*’ (GLVIA3, paragraph 6.1). The assessment of visual effects is thus concerned with the potential visual change experienced by people as a result of implementing the Morgan Generation Assets and may include changes to existing static and sequential views, or the wider visual amenity.

1.8.1.3 The level of visual effect (and whether this is significant or not) is determined through consideration of the sensitivity of each visual receptor (or group) and the magnitude of impact that will potentially be brought about by the construction, operations and maintenance and decommissioning of the Morgan Generation Assets.

1.8.2 Zone of Theoretical Visibility

1.8.2.1 Plans mapping the ZTV for the turbine array (that overlaps with that of the offshore substations) are used to establish the extent of theoretical visibility of the Morgan Generation Assets throughout the SLVIA study area and to assist with representative viewpoint selection. The hub height ZTV take account of the screening effects of some of the larger areas of vegetation in England and Wales, as shown on the 1:50,000 Ordnance Survey (OS) mapping. The hub height ZTV does not take account of vegetation screens on the Isle of Man. The tip and hub height ZTVs do not reflect local topographical variations, hedgerows, individual trees, or smaller built structures, such as walls. A ZTV is only an indication of where a proposed structure might be seen from. It does not indicate how much of the Morgan Generation Assets can be seen or reflect the effects of perspective. It simply shows that part of the Morgan Generation

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Assets is visible, however small or distant. As such it is an MDS, a tool to be followed up by fieldwork, which verifies what of the Morgan Generation Assets might actually be visible.

1.8.3 Representative Viewpoints

1.8.3.1 Representative viewpoints are used to assist the assessment and cover a range of locations within the SLVIA study area at differing distances and orientations relative to the Morgan Generation Assets. The purpose of these is to help assess both the level of visual effect for visual receptors and guide the design process, and generally focus the assessment.

1.8.3.2 The representative viewpoints used in the SLVIA have been agreed with the relevant consultees as part of the Morgan Generation Assets consultation process, as referred to previously in section 1.3 above.

1.8.3.3 The assessment process involved visiting the representative viewpoint location and viewing wireline visualisations of the Morgan Generation Assets prepared for each. The fieldwork was conducted in periods of favourable visibility, during both the summer and winter months to take account of the seasonal variation in vegetation cover. The changes in visibility over the year are set out in Appendix B: Meteorological office data.

1.8.4 Evaluating visual sensitivity to change

1.8.4.1 The sensitivity of each visual receptor (the particular person or group of people likely to be affected at a specific viewpoint) *‘should be assessed in terms of both their susceptibility to change in views and visual amenity and also the value attached to particular views’* (GLVIA3, paragraph 6.31). In this SLVIA, susceptibility and value of visual receptors are defined as follows:

- Visual Susceptibility: ‘The susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:
the occupation or activity of people experiencing views at the particular locations; and,
the extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at particular locations’ (GLVIA3, paragraph 6.32)
- Value of views: Judgements made about the value of views should take account of: *‘recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations; and, indicators of value attached to views by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment (such as parking places, sign boards or interpretive material) and references to them in literature or art...’* (GLVIA3, paragraph 6.37).

1.8.5 Visual sensitivity criteria

1.8.5.1 Sensitivity is not readily graded in bands and GLVIA notes, with regards to visual sensitivity, that the division of who may or may not be sensitive to a particular change *‘is not black and white and in reality, there will be a gradation in susceptibility to change’* (GLVIA, paragraph 6.35). To provide both consistency and transparency to the assessment process, Table 1.2 below defines the criteria which have guided the judgement as to the intrinsic susceptibility and value of the visual receptor and their

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subsequent sensitivity to changes to views brought about by the Morgan Generation Assets.

Susceptibility

1.8.5.2 The susceptibility of visual receptors is a function of the activity in which the receptor is involved and the extent to which their attention or interest may be focussed on the views and visual amenity they experience at particular locations.

1.8.5.3 Susceptibility is categorised as Very High, High, Medium, Low or Negligible.

Value

1.8.5.4 Value considers the importance attached to views and visual amenity which may be evidenced by its position in a designated landscape or associated with a cultural heritage asset. Other indicators of value may include recognition of a view or views in guidebooks or on maps; the provision of facilities for the enjoyment of a view; and references in literature or art. Views of lesser value may include local views from residential areas which have no wider recognition.

1.8.5.5 Value is categorised as International, National, Regional and Community.

Table 1.2: Visual sensitivity to change.

Sensitivity	Typical descriptors	
	Visual receptor susceptibility	Value of view
Very High	Might be visitors to an internationally or nationally designated landscape or recognised visitor attraction where views to and from the designated landscape or visitor destination are integral to the quality of the visual amenity experienced at that location.	International may include important views from internationally designated landscapes or views noted in national guidebooks as visitor attractions.
High	Might be visitors to a nationally designated landscape or recognised visitor destination or route where views to and from the designated landscape or attraction are integral to the visual amenity experienced at that location. People engaged in outdoor recreation using public rights of way or Access Land in nationally designated landscapes. Users of a national trails or other tourist routes may also be of high susceptibility although susceptibility to change can vary along a route depending on the nature of the locality through which the route passes.	National may include important views from nationally designated landscapes or views noted in national guidebooks and maps. May also include views from national trails, cycle routes and views identified in citations of registered parks and gardens or views important to the understanding of a cultural heritage asset.
Medium	Might include those people whose attention or interest is focussed on their surroundings to a degree but is not integral to the activity being pursued. This may include transitory views from local roads or public transport including ferries.	Regional may include views identified in Conservation Area Appraisals, views from regionally important landscapes, such as Special Landscape Areas, or Areas of Great Landscape Value, promoted paths/regional trails and views noted in landscape character assessments.

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Sensitivity	Typical descriptors	
	Visual receptor susceptibility	Value of view
Low	Might include those people whose attention or interest is not immediately focussed on their surroundings and may include people using rapid transport routes such as major road and rail links. It may also include people at their place of work where their surroundings are not integral to the work being undertaken.	Community may include views that are not recognised through a designation and are undocumented. The views may be valued locally (e.g. through Neighbourhood Plans) although not of importance in the wider area.
Negligible	Might include those people whose attention or interest is not focussed on their surroundings or whose immediate surroundings truncate views.	Views that are not noted in any documentation and are simply those gained as people go about their day-to-day activities.

Visual sensitivity

1.8.5.6 Table 1.3 indicates how visual susceptibility and value of views combine to give overall sensitivity of the receptor. Each receptor is considered individually in relation to the specific development. Therefore, in practice there is an element of professional judgement regarding overall sensitivity which means that a particular combination of susceptibility and value may not result in the outcome shown in Table 1.3.

Table 1.3: Visual sensitivity evaluation.

Sensitivity of receptor (value)	Susceptibility				
	Negligible	Low	Medium	High	Very High
Community	Negligible	Low	Medium to low	High to medium	High
Regional	Negligible	Low	Medium	High to medium	High
National	Low	Low	High to medium	High	Very high to high
International	Low	Medium	High	Very high to high	Very high

1.8.6 Evaluating visual magnitude of impact

1.8.6.1 GLVIA3 advises that ‘Each of the visual effects identified needs to be evaluated in terms of its size or scale, the geographical extent of the area influenced, and its duration and reversibility’ (GLVIA3, paragraph 6.38). The approach to evaluating overall magnitude of change involves two main steps. Firstly, the key factors of scale of change and geographical extent are evaluated and combined to provide an initial evaluation. The results of the first step are then combined with the evaluation of duration and reversibility.

Size or scale

1.8.6.2 Of these three factors scale of change has more of an influence on the overall judgement of magnitude. Geographical extent of the change also has an important influence on the overall outcome of the magnitude evaluation when combined with

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scale of change. For example, a large scale of change that occurs across a limited geographical extent would result in a lower magnitude of impact than a large scale of change across a wide geographical extent. Scale of change is evaluated in accordance with GLVIA3 with typical descriptors listed below which are used as a guide to the degree of change that may be experienced. The descriptors are not intended to fit every impact assessed and professional judgement is used in each magnitude evaluation.

1.8.6.3

An assessment is made about the size or scale of change in the view that is likely to be experienced because of the Morgan Generation Assets, based on the following criteria:

- **Distance:** the distance between the visual receptor/viewpoint and the Morgan Generation Assets. Generally, the greater the distance, the lower the magnitude of impact, as the Morgan Generation Assets will constitute a smaller scale component of the view. Distance can be quantified and described objectively
- **Size:** the amount and size of the Morgan Generation Assets that will be seen. Visibility may range from small or partial visibility of the Morgan Generation Assets to all the offshore or onshore elements being visible. Generally, the closer and greater the number of elements within the Morgan Generation Assets appearing in the view, the higher the magnitude of impact. This is also related to the degree to which the Morgan Generation Assets may be wholly or partly screened by landform, vegetation (seasonal) and/or built form. Conversely open views are likely to reveal more of the Morgan Generation Assets, particularly where this is a key characteristic of the seascape/landscape. The amount of development visible can be described objectively in part by reference to the proportion of the whole in view
- **Scale:** the scale of change in the view with respect to the loss or addition of features in the view and changes in its composition. The scale of the Morgan Generation Assets may appear larger or smaller relative to the existing view composition
- **Field of view (FoV):** the extent or proportion of the view that is affected by the Morgan Generation Assets. Generally, the greater the extent or proportion impacted, the higher the impact magnitude will be. If the Morgan Generation Assets extends across the whole of the view, the magnitude of impact will generally be higher. Conversely, if the Morgan Generation Assets occupies just a narrow portion of the view, the magnitude of impact is likely to be reduced. This can in part be described objectively by reference to the horizontal and vertical FoVs affected relative to the extent of the available view
- **Contrast:** the character and context within which the Morgan Generation Assets will be seen and the degree of contrast or integration of any new features with existing seascape or landscape elements, in terms of scale, form, mass, line, height, colour, luminance and (e.g. in the case of the wind turbines) motion. Contrasts and changes may arise because of the rotation movement of the wind turbine blades, as a particular characteristic that gives rise to effects. Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of impact. Conversely, congruity with existing surroundings is likely to be less impactful
- **Consistency of image:** the consistency of image of the Morgan Generation Assets in relation to other developments. The magnitude of impact is likely to be lower if its wind turbine height, arrangement, and layout design are broadly

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similar to other developments in the seascape, in terms of its scale, form and general appearance. The same applies to the size of the substation(s) in the landscape relative to other buildings or structures

- **Skyline/background:** whether the Morgan Generation Assets will be viewed against the skyline, or a landform or seascape backdrop may affect the level of contrast and magnitude. If it adds to an already developed backdrop or skyline the magnitude of impact will tend to be lower
- **Number:** generally, the greater the number of separate elements within a proposed development seen simultaneously or sequentially, the higher the magnitude of impact. This can usually be quantified and described objectively
- **Nature of visibility:** the nature of visibility is a further factor for consideration. The Morgan Generation Assets may be subject to various phases of development and the way it is viewed will vary throughout the year due to differing weather and atmospheric conditions/visibility and seasonal variations, including vegetation cover (see Appendix B: Meteorological Office visibility data).

Geographical extent

1.8.6.4 The geographic extent over which the visual effect will be experienced is distinct from the size or scale of effect and is described in terms of the physical area or location over which it will be experienced (quantifiable as a linear or area measurement). The extent of effects will vary according to the specific nature of the Morgan Generation Assets and is principally assessed through consideration of the ZTV, field survey and analysis of the extent of visibility likely to be experienced by visual receptors on the ground at the representative viewpoints.

1.8.6.5 Table 1.4 below sets out the scale of change and geographical extent criteria for assessing the magnitude of impact.

Table 1.4: Criteria used for magnitude of impact - scale of change and geographical extent.

Magnitude of impact	Typical descriptors	
	Scale of change	Geographical extent
Large	A high degree of loss and/or addition of features that redefines the composition of views. The proposed development occupies a large proportion of available views and appears large in size relative to other features in the view and the location of the visual receptor. It contrasts markedly with other features in the view and does not integrate with the existing view composition in terms of its built form and overall appearance.	The proposed development would be visible from a wide area.

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Magnitude of impact	Typical descriptors	
	Scale of change	Geographical extent
Medium	A moderate degree of loss and/or addition of features that changes the composition of views without redefining it. The proposed development occupies a moderate proportion of available views and appears medium in size relative to other features in the view and the location of the visual receptor. It contrasts with other features in the view and does not wholly integrate with the existing view composition in terms of its built form and overall appearance.	The proposed development would be visible from an intermediate area.
Small	Little loss and/or addition of features that changes the composition of views without redefining it. The proposed development occupies a small proportion of available views and appears small in size relative to other features in the view and the location of the visual receptor. It contrasts slightly with other features in the view and integrates to a degree with the existing view composition in terms of its built form and overall appearance.	The proposed development would be visible from limited area.
Negligible	Very little loss and/or addition of features resulting in minimal change to the composition of views. The proposed development occupies a very small proportion of available views and appears inferior in size relative to other features in the view and the location of the visual receptor. No apparent contrast with other features in the view and integrates reasonably well with the existing view composition in terms of its built form and overall appearance.	The proposed development would be visible from very limited area.

1.8.6.6 Table 1.5 shows how scale of change and geographical extent combine to give an initial evaluation.

Table 1.5: Magnitude of visual change – Step 1 evaluation.

Geographical extent	Scale of change			
	Negligible	Small	Medium	Large
Negligible	Negligible	Negligible	Small	Small
Small	Negligible	Small	Medium	Medium
Medium	Small	Medium	Medium	High
Large	Small	Medium	High	High

Duration and reversibility

- 1.8.6.7 GLVIA3 advises that duration and reversibility should be clearly defined for the development being assessed and that duration and reversibility may be combined into a single judgement.
- 1.8.6.8 The duration and reversibility of visual effects are based on the period over which the Morgan Generation Assets is likely to exist (i.e. during construction, operations and maintenance and decommissioning phase), with effects being reversed at the end of that period. The criteria for duration are listed in paragraph 1.8.6.9, below.
- 1.8.6.9 Long-term, medium-term, and short-term visual effects are defined as follows:
 - Long-term: more than 10 years (may be permanent or reversible)
 - Medium-term: six to 10 years (reversible)
 - Short-term: nought to five years (reversible).
- 1.8.6.10 The second step of the magnitude of change judgement combines the outcome of Step 1 with the evaluation of duration and reversibility as shown in Table 1.6 giving the overall evaluation judgement.

Table 1.6: Magnitude of visual change – Step 2 overall evaluation.

Duration/ reversibility	Step 1 evaluation			
	Negligible	Small	Medium	High
Short-term	Negligible	Negligible	Small	Medium
Medium-term	Negligible	Small	Medium	Medium
Long-term	Negligible	Small	Medium	Large
Permanent	Small	Medium	Large	Large

- 1.8.6.11 The magnitude of change evaluation also considers whether views of the proposed development will be full, partial, glimpsed or intermittent, and whether views will be direct or at an oblique angle.

Visual magnitude of impact rating

- 1.8.6.12 The magnitude of impact resulting from the Morgan Generation Assets is described as large, medium, small and negligible as defined in Table 1.7 below.

Table 1.7: Visual Magnitude of Impact Criteria.

Magnitude of Impact	Definition
Large	Complete or very substantial visual change involving complete or very substantial obstruction of existing view or complete change in character and composition of visual baseline (i.e. pre- development view) (e.g. through removal of key elements).
Medium	Moderate visual change, which may involve partial obstruction of existing view or partial change in character and composition of visual baseline (i.e. pre- development view) through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter the scale and character of the surroundings and the wider setting. Composition of views would alter.

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Magnitude of Impact	Definition
	View character may be partially changed through the introduction of features which, although uncharacteristic, may not necessarily be visually discordant.
Small	Minor change to the visual baseline (i.e. pre-development view) – change would be distinguishable from the surroundings whilst view composition and character would be similar to the pre- change circumstances.
Negligible	Very slight change in visual baseline (i.e. pre- development view) – change barely distinguishable from the surroundings. Composition and character of view substantially unaltered.

1.8.7 Evaluating significance of visual effect

- 1.8.7.1 The significance of a visual effect is evaluated through the combination of visual sensitivity and magnitude of impact. Once the level of effect has been established, a judgement is then made as to whether the effect is ‘significant’ as required by the current EIA Regulations. This process is assisted by the matrix in section 1.10 below, which is used to guide the assessment.
- 1.8.7.2 A significant effect is more likely to occur where a combination of the variables results in the Morgan Generation Assets having a defining effect on the view or visual amenity, or where changes materially affect a visual receptor of high sensitivity. An effect is more likely to be assessed as not significant when the combination of variables results in the Morgan Generation Assets having a non-defining effect on the view or visual amenity, or where predicted changes affect a low sensitivity visual receptor.

1.9 Assessment of seascape and landscape effects

1.9.1 Introduction

- 1.9.1.1 The Marine Policy Statement (UK Government, 2011) states ‘*references to seascape should be taken as meaning landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other.*’ In England, seascape characterisation includes both the sea surface and what lies below the waterline.
- 1.9.1.2 The Guide to best practice in seascape assessment (INTERREG Report No. 5), 2001 defines seascape to include: ‘*views from land to sea; views from sea to land; views along coastline; the effect on landscape at the conjunction of sea and land.*’
- 1.9.1.3 For Morgan Generation Assets, England National Character Areas (NCAs), Isle of Man Landscape Character Areas, English Marine Character Areas (MCAs), Wales National MCAs and Welsh Seascape Sensitivity Zones (SSZs) are considered to be appropriate for the assessment of effects on seascape and landscape character. Where there is a gap in these and other published assessments, this SLVIA has identified and described its own seascape character areas using available information.
- 1.9.1.4 Other sources of seascape and landscape character information which have informed this assessment are listed above in Table 1.1. Proforma tables of assessing landscape and seascape sensitivity, derived from *Landscape Sensitivity Assessment Guidance* (NatureScot, April 2022) are included at Appendix C: Landscape and seascape value and susceptibility of landscapes and seascapes.

1.9.2 Evaluating seascape and landscape sensitivity to change

1.9.2.1 The sensitivity of a seascape/landscape receptor is a combination of *'judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape'* (GLVIA3, paragraph 5.39). In this SLVIA, susceptibility and value of seascape/landscape receptors are defined as follows:

- Landscape susceptibility: *'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 change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies'* (GLVIA3, paragraph 5.40)
- Value of the landscape receptor: *'The value of the Landscape Character Types or Areas that may be affected, based on review of designations at both national and local levels, and, where there are no designations, judgements based on criteria that can be used to establish landscape value; and, the value of individual contributors to landscape character, especially the key characteristics, which may include individual elements of the landscape, particularly landscape features, notable aesthetic, perceptual or experiential qualities, and combinations of these contributors'* (GLVIA3, paragraph 5.44).

1.9.2.2 The assessment of seascape/landscape sensitivity has regard to published landscape and seascape sensitivity studies including NRW Stage 3 report (Report No. 331).

Seascape and landscape susceptibility to change

1.9.2.3 The susceptibility of a seascape/landscape character receptor to change is a reflection of its ability to accommodate the changes that would result from the introduction of the Morgan Generation Assets without detrimental consequences for the maintenance of the baseline situation and/or fulfilment of landscape planning policies and strategies. Some seascape and landscape receptors are better able to accommodate development than others due to certain characteristics indicative of their capacity to accommodate change.

1.9.2.4 The susceptibility of a seascape or landscape receptor to change has been classified as very high, high, medium, low or negligible. The assessment has been made using evidence and professional judgement based on the following criteria:

- **Overall strength and robustness:** collectively the overall characteristics and qualities of a particular seascape/landscape result in a strong and robust character that is capable of reasonably accommodating the influence of the Morgan Generation Assets without undue adverse effects on the special qualities (in the case of a designated landscape), or the key characteristics for which an area of seascape or landscape character is valued
- **Seascape and landscape scale and topography:** the scale and topography are large enough to physically accommodate the influence of the Morgan Generation Assets. Topographical features such as more complex, distinctive or small-scale landforms are likely to be more susceptible than larger scale, simple, expansive and homogenous landforms
- **Openness and enclosure:** openness in the seascape or landscape may increase susceptibility to change because it can result in wider visibility. However, an open seascape/landscape may also be larger scale and simple which will decrease its susceptibility. Conversely, enclosed seascape/landscapes can offer

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more screening potential, limiting visibility to a smaller area. However, they may also be smaller scale and more complex which will increase susceptibility. In general, broad and open seascapes/landscapes are likely to be less susceptible to the Morgan Generation Assets than more enclosed, complex seascapes and landscapes (such as indented bays, headlands, small-scale and varied coastal landscapes)

- **Skyline:** prominent and distinctive skylines and horizons with important landmark features identified in seascape/landscape character assessments are generally considered to be more susceptible to development compared with broad, simple skylines/horizons which lack landmark features or contain built features and human activities
- **Relationship with other development and landmarks:** contemporary landscapes where there are existing similar developments (e.g. wind farms) or other forms of development and related activities (industry, mineral extraction, masts, urban fringe/large settlement, major transport/shipping routes) that already have a characterising influence result in a lower susceptibility to development as opposed to areas characterised by smaller scale, historic development and landmarks
- **Perceptual qualities:** notable landscapes acknowledged to be particularly scenic, wild, or tranquil are generally considered to be more susceptible to development in comparison to ordinary, cultivated, farmed, or developed landscapes where perceptions of 'wildness' and tranquillity are less tangible or more diluted. However, landscapes which are either remote or appear natural may vary in their susceptibility to development. Dynamic landscapes/seascapes (i.e. supporting human generated activity/movement) are considered less susceptible than the converse described above
- **Seascape/landscape context and association:** the extent to which the Morgan Generation Assets will influence the character of the seascape, landscape and visual resource study area relates to existing associations between the host seascape or landscape receptor and the receptor from which it is being experienced. In some situations, this association will be strong (i.e. where the seascapes/landscapes are directly related) whereas in others it will be less marked (i.e. where the seascape or landscape association is weak). The seascape/landscape context and visual connections with areas of adjacent seascape or landscape character or designations has a bearing on the susceptibility to development.

Value of seascape and landscape receptors

- 1.9.2.5 The value of landscape and seascape receptors '*...will to some degree reflect landscape designations and the level of importance and the level of importance which they signify, although there should not be over-reliance on designations as the sole indicator of value.*' (GLVIA3, paragraph 5.45).
- 1.9.2.6 The value of a seascape/landscape has been classified as very high, high, medium, low, or negligible. The assessment has been made using evidence and professional judgement based on the following criteria.
- **Seascape or landscape designations:** a receptor that lies within the boundary of a recognised landscape related planning designation will be of increased value, depend on the proportion of the receptor that is so influenced and the level of importance of the designation (i.e. international, national, regional or local).

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The absence of designations does not however preclude value, as an undesignated landscape character receptor may be valued as a resource in the local or immediate environment. *Technical Guidance Note 02/21: Assessing landscape value outside national designations* (Landscape Institute, May 2021) is helpful when considering the value of landscape receptors

- **Seascape or landscape quality:** the quality of a seascape/landscape character receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness, and the extent to which its valued attributes have remained intact. A seascape or landscape with consistent, intact, well-defined and distinctive attributes is considered to be of higher quality and, in turn, higher value, than a less intact landscape containing elements that detract from its character. This would include aspects such as: Natural heritage - landscape with clear evidence of ecological, geological, geomorphological or physiographic interest which contribute positively to the landscape; cultural heritage - landscape with clear evidence of archaeological, historical or cultural interest which contribute positively to the landscape; and landscape condition - landscape which is in a good physical state both with regard to individual elements and overall landscape structure
- **Seascape or landscape experience:** the experiential qualities evoked by a landscape receptor can add to its value. This relates to several factors, including: The perceptual responses it evokes (scenic, wildness, tranquillity); the cultural associations that may exist in the arts, events/ history or with notable people; and the distinctiveness of the seascape/landscape. Other factors include the functional and recreational value of the seascape/landscape.

1.9.2.7 Due to the distance from land, the assessment of the effects of the Morgan Generation Assets array and OSPs, Volume 2, Chapter 10: Seascape, landscape and visual resources of the Environmental Statement has considered seascapes and nationally and internationally designated landscapes only. Volume 4, Annex 10.5: Internationally and nationally designated landscape study of the Environmental Statement considers those designated landscapes where the extended 60 km study area is applicable.

Seascape and landscape sensitivity rating

1.9.2.8 As with visual sensitivity described above (Table 1.2) seascape and landscape sensitivity is not readily graded into bands. In order to provide both consistency and transparency to the assessment process, descriptions of landscape susceptibility and value are based on the same sliding scale as visual receptors (i.e. negligible, low, medium, high and very high) as set out in Table 1.8 below.

Table 1.8: Sensitivity of seascape and landscape receptors.

Sensitivity	Typical Descriptors	
	Seascape/Landscape Resource/Receptor Susceptibility	Seascape/Landscape Resource/Receptor Value
Very High	Exceptional seascape/landscape quality; absence of seascape/landscape detractors; no or limited potential for substitution. Key elements/features well known to the wider public	Internationally/nationally designated landscape, or key elements or features of nationally/internationally designated seascape/landscape
High	Strong/distinctive seascape/landscape character; relatively free of seascape/landscape detractors	Nationally/regionally designated landscape areas or features

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Sensitivity	Typical Descriptors	
	Seascape/Landscape Resource/Receptor Susceptibility	Seascape/Landscape Resource/Receptor Value
Medium	Some distinctive seascape/landscape characteristics; presence of seascape/landscape detractors	Regionally/locally designated/valued landscape and features, e.g., Special Landscape Areas (SLA)
Low	Absence of distinctive seascape/landscape characteristics; unavoidable presence of seascape/landscape detractors	Undesignated seascape/landscape and features
Negligible	Absence of positive seascape/landscape characteristics. Significant presence of seascape/landscape detractors	Undesignated seascape/landscape and features

1.9.2.9 Table 1.9 indicates how seascape/landscape susceptibility and value combine to give overall sensitivity of the receptor. Each receptor is considered individually in relation to the specific development. Therefore, in practice there is an element of professional judgement regarding overall sensitivity which means that a particular combination of susceptibility and value may not result in the outcome shown in Table 1.9.

Table 1.9: Landscape and seascape sensitivity evaluation.

Value	Susceptibility				
	Negligible	Low	Medium	High	Very high
Undesignated (with detractors)	Negligible	Negligible	Negligible	Low	Low
Community	Negligible	Low	Medium to low	Medium	High to medium
Regional	Negligible	Low	Medium	High to medium	High
National	Low	Low	High to medium	High	Very high to high
International	Low	Medium	High	Very high to high	Very high

1.9.3 Seascape and landscape magnitude of impact

1.9.3.1 GLVIA3 advises that ‘Each effect on landscape receptors needs to be assessed in terms of its size or scale, the geographical extent of the area influenced, and its duration and reversibility’ (GLVIA3, paragraph 5.48). The approach to evaluating overall magnitude of change involves two main steps. Firstly, the key factors of scale of change and geographical extent are evaluated and combined to provide an initial evaluation. The results of the first step are then combined with the evaluation of duration and reversibility.

Size or scale of change

1.9.3.2 Of these factors scale of change has more of an influence on the overall judgement of magnitude. Geographical extent of the change also has an important influence on the overall outcome of the magnitude evaluation when combined with scale of change. For example, a large scale of change that occurs across a limited geographical extent

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would result in a lower magnitude of impact than a large scale of change across a wide geographical extent. Scale of change is evaluated in accordance with GLVIA3 with typical descriptors listed below which are used as a guide to the degree of change that may be experienced. The descriptors are not intended to fit every impact assessed and professional judgement is used in each magnitude evaluation.

1.9.3.3

This criterion relates to the size or scale of change to the seascape/ landscape that will arise as a result of a proposed development, based on the following factors:

- **Seascape and landscape elements:** the degree to which the pattern of elements that makes up the seascape/landscape character will be altered by the Morgan Generation Assets, by removal or addition of elements compared with the baseline situation. The magnitude of impact will generally be higher if the seascape/landscape features are extensively removed or altered, and/or if many new elements are added to the seascape/landscape
- **Seascape and landscape characteristics:** this relate to the extent to which the effect of the Morgan Generation Assets changes, physically or perceptually, the key characteristics of the seascape/landscape that may be important to its distinctive character. This may include, for example, the scale of the seascape or landform, its relative simplicity or irregularity, and the seascape/landscape context. Also relevant are: the grain or orientation of the seascape landscape; the degree to which the receptor is influenced by external features; and the juxtaposition of the Morgan Generation Assets in relation to these and other baseline characteristics. If the Morgan Generation Assets is located in a seascape or landscape receptor that is already affected by other similar development, this may reduce the magnitude of impact
- **Landscape designation:** in the case of designated landscapes, the degree of change is considered in light of potential effects on the special qualities for which the area is designated which in turn underpin the integrity of the designation. All seascapes and landscapes change over time and much of that change is managed or planned. Designated landscapes often have management objectives for protection from or accommodation of development. The scale of change may be localised, occurring over limited parts of a designated area, or more widespread affecting a large part of designation, in which latter case the overall integrity of the designated area may potentially be affected
- **Distance:** the size and scale of change is also strongly influenced by the proximity of the Morgan Generation Assets to the receptor and the extent to which the development has a characterising influence on the seascape/landscape. Consequently, the scale or magnitude of impact is likely to be lower in respect of receptors that are distant from the Morgan Generation Assets and/or screened by intervening landform, vegetation and built form. This is because the scale of its influence on such seascape or landscape receptors is small or limited. Conversely, those seascapes and landscapes closest to the development are likely to be most affected. Host seascapes and landscapes will be directly affected whilst adjacent areas of seascape or landscape character will be indirectly affected
- **Amount and nature of change:** the amount of development components and context in which the Morgan Generation Assets will be seen has a bearing on impact magnitude. Visibility of it may range from one wind turbine blade tip to all the wind turbines. Broadly speaking, the greater the amount of development that can be seen, the higher the scale of change. The degree to which the Morgan Generation Assets is perceived to be on the horizon or within the

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seascape/landscape also has a bearing on the amount and nature of change. In general, the magnitude of impact is likely to be lower when the Morgan Array Area is perceived to be on the horizon, or beyond it, at distance, rather than within the seascape or landscape.

Geographical extent

1.9.3.4 The geographic extent over which the seascape or landscape effects would be experienced is distinct from the size or scale of effect. This evaluation is an expression of the geographic extent of the receptor that will experience a particular magnitude of impact and the corresponding extents of potential significant and non-significant effect. This will vary depending on the specific nature of the Morgan Generation Assets and is principally assessed through analysis of the extent of its visibility and the likely geographic extent of perceived changes to seascape/landscape character.

1.9.3.5 Table 1.10 sets out the scale of change and geographical extent criteria for assessing the magnitude of impact.

Table 1.10: Criteria used for magnitude of impact - scale of change and geographical extent.

Magnitude of impact	Typical descriptors	
	Scale of change	Geographical extent
Large	High degree of loss and/or addition of features that redefines key characteristics across a large proportion of the receptor and has a defining influence on landscape character or special qualities of the receptor.	The proposed development would affect a large proportion of the receptor.
Medium	Moderate degree of loss and/or addition of features that changes key characteristics across some of the receptor partially influencing landscape character or special qualities of the receptor without redefining it.	The proposed development would affect an intermediate proportion of the receptor.
Small	Little loss and/or addition of features and limited change to key characteristics. The underlying character of the receptor and special qualities remain largely intact.	The proposed development would affect a limited proportion of the receptor.
Negligible	Very little loss and/or addition of features resulting in barely discernible change to the character and qualities of the receptor.	The proposed development would affect a very limited proportion of the receptor.

1.9.3.6 Table 1.11 shows how scale of change and geographical extent combine to give an initial evaluation.

Table 1.11: Magnitude of landscape/seascape change – Step 1 evaluation.

Extent	Scale of change			
	Negligible	Small	Medium	Large
Negligible	Negligible	Negligible	Small	Small
Small	Negligible	Small	Medium	Medium
Medium	Small	Medium	Medium	High
Large	Small	Medium	High	High

Duration and reversibility

1.9.3.7 GLVIA3 advises that duration and reversibility should be clearly defined for the development being assessed and that duration and reversibility may be combined into a single judgement.

1.9.3.8 The duration and reversibility of seascape and landscape effects has been based on the period over which the Morgan Generation Assets is likely to exist (i.e. during construction, operations and maintenance and decommissioning phase) the extent to which it will be removed and its effects reversed at the end of that period (during decommissioning). Long-term, medium-term and short-term seascape/landscape effects are defined as follows:

- Long-term: more than 10 years (may be defined as permanent or reversible)
- Medium-term: six to 10 years (reversible)
- Short-term: nought to five years (reversible).

Seascape and landscape magnitude of impact rating

1.9.3.9 The magnitude of impact resulting from the Morgan Generation Assets is described as large, medium, small or negligible. In assessing magnitude of impact, the assessment focuses on the size or scale of change. The geographic extent, duration and reversibility are stated separately in relation to the assessed effects (i.e. as short, medium, or long-term and temporary or permanent in the case of the last option). The assessment of magnitude for each receptor is based on evidence and professional judgement. The levels of magnitude of impact that can occur are defined in Table 1.12.

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Table 1.12: Definition of terms relating to the magnitude of impact upon seascape and landscape receptors.

Magnitude of Impact	Definition
Large	Total loss, or/very substantial loss or addition of key elements/features/patterns of the baseline (i.e. pre-development seascape/landscape) and/or introduction of dominant, uncharacteristic elements compared to the attributes of the receiving seascape/landscape.
Medium	Partial loss or addition of, or moderate alteration to, one or more key elements/features/patterns of the baseline (i.e. pre-development seascape/landscape) and/or introduction of elements that may be prominent but would not be substantially uncharacteristic in comparison to the attributes of the receiving seascape/landscape.
Small	Minor loss or addition of, or alteration to, one or more key elements/features/patterns of the baseline, (i.e. pre-development seascape/landscape) and/or introduction of elements that may not be uncharacteristic compared to the surrounding seascape/landscape.
Negligible	Very minor loss or addition of, or alteration to, one or more key elements/features/patterns of the baseline (i.e. pre-development seascape/landscape) and/or introduction of elements that are not uncharacteristic in comparison to the surrounding seascape/landscape; approximating to a 'no-change' situation.

1.9.3.10 The second step of the magnitude of change judgement combines the outcome of Step 1 with the evaluation of duration and reversibility as shown in Table 1.13 giving the overall evaluation judgement.

Table 1.13: Magnitude of landscape and seascape change – Step 2 overall evaluation.

Duration/ reversibility	Step 1 evaluation			
	Negligible	Small	Medium	High
Short-term	Negligible	Small	Small	Medium
Medium-term	Negligible	Small	Medium	Medium
Long-term	Negligible	Small	Medium	Large
Permanent	Small	Medium	Large	Large

1.9.4 Evaluating seascape and landscape significance of effect

1.9.4.1 The level of seascape and landscape effect is evaluated through the combination of receptor sensitivity and magnitude of impact. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix in Table 1.14 which is used to guide the assessment.

1.9.4.2 A significant effect would occur where the combination of the variables results in the Morgan Generation Assets having a defining effect on the seascape or landscape

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receptor, or where changes of a lower magnitude clearly and demonstrably affect a seascape or landscape receptor of particularly high sensitivity. A major loss or irreversible effect over an extensive area of seascape/landscape character, affecting nationally or internationally valued elements, characteristics and/or perceptual aspects is likely to be significant.

1.9.4.3 An effect that is not significant would occur where the effect of the Morgan Generation Assets is not defining, and the seascape or landscape receptor continues to be characterised principally by its baseline character. Equally, a small-scale change experienced by a receptor of high sensitivity may not significantly affect the integrity of a designation. Reversible seascape and landscape effects that are of small-scale or affecting lower value receptors are unlikely to be significant.

1.10 Evaluation of significance of effect

1.10.1.1 The significance of an effect upon seascape, landscape and visual receptors is determined by correlating the magnitude of the impact and the sensitivity of the receptor, as presented in Table 1.14.

1.10.1.2 For the purposes of this assessment, any effects with a significance level of substantial or major have been deemed significant in EIA terms. An accumulation of individual moderate effects, for instance experienced during a journey undertaken by the same visual receptor, may also be judged as significant in some circumstances.

1.10.1.3 Effects are assessed as being adverse, neutral or positive. The judgements regarding the significance of effect and that relating to whether an effect is beneficial or adverse are entirely separate. The assessment of whether an effect is positive, neutral or adverse is based on professional judgement having regard to the relevant objective factors.

Table 1.14: Assessment of significance of effect matrix.

Sensitivity of receptor	Magnitude of impact			
	Negligible	Small	Medium	Large
Negligible	Negligible	Negligible to Minor	Negligible to Minor	Negligible to Minor
Low	Negligible to Minor	Negligible to Minor	Minor	Minor to Moderate
Medium	Negligible to Minor	Minor	Moderate	Moderate to Major
High	Negligible to Minor	Minor to Moderate	Moderate to Major	Major
Very high	Minor	Moderate to Major	Major	Substantial

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1.10.1.4 A description of the terms used to describe the level of significance of effect is provided in Table 1.15 below.

Table 1.15: Definitions of Significance Criteria.

Level of Significance	Typical descriptors	
	Seascape and landscape resource	Visual resource
Substantial	Where proposed changes would be uncharacteristic and/or would significantly alter a landscape of exceptional landscape quality (e.g. internationally designated landscapes), or key elements known to the wider public of nationally designated landscapes (where there is no or limited potential for substitution nationally).	Where proposed changes would be uncharacteristic and/or would significantly alter a view of remarkable scenic quality, within internationally designated landscapes or key features or elements of internationally or nationally designated landscapes that are well known to the wider public.
Major	Where proposed changes would be uncharacteristic and/or would significantly alter a valued aspect of (or a high quality) seascape/landscape.	Where proposed changes would be uncharacteristic and/or would significantly alter a valued view or a view of high scenic quality.
Moderate	Where proposed changes would be demonstrably out of scale or at variance with the character of an area.	Where proposed changes to views would be demonstrably out of scale or at variance with the existing view.
Minor	Where proposed changes would be at slight variance with the character of an area.	Where proposed changes to views, although discernible, would only be at slight variance with the existing view.
Negligible	Where proposed changes would have an indiscernible effect on the character of an area.	Where proposed changes would have a barely noticeable effect on views/visual amenity.

1.11 Assessment of night-time effects

1.11.1 Introduction

1.11.1.1 The assessment of night-time effects is based on the description of lighting for the Morgan Generation Assets, as set out in Volume 1, Chapter 3: Project description of the Environmental Statement.

1.11.1.2 The SLVIA study area for the assessment of night-time effects is the same as that for daytime, informed by the likely patterns of human use or activities at night-time. The assessment of night-time effects considers the potential effects upon night-time views, seascape and landscape for the offshore elements of the Morgan Generation Assets during its construction, operations and maintenance, and decommissioning phases. Having regard to the proportionality principle, the focus of the night-time assessment is on areas/locations where potential seascape, landscape and visual effects are likely to be experienced by the greatest number of people.

1.11.2 Evaluating night-time effects and significance of effect

1.11.2.1 Whilst the nature of daytime and night-time effects of the Morgan Generation Assets are very different, in that during daylight hours the visibility of moving rotors gives rise to effects that are very different to the pinpoint effects of lighting at night, the same criteria are considered appropriate for assessment of its potential night-time effects.

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1.11.2.2 As with the assessment of daytime effects, the significance of the potential night-time effects of the Morgan Generation Assets is assessed through a correlation of the seascape, landscape or visual receptor sensitivity and the magnitude of impact that would result from lighting of the Morgan Generation Assets.

1.11.2.3 A significant night-time effect is likely where implementation of the Morgan Generation Assets would have a defining influence on a landscape, seascape or visual receptor at night. In contrast, a not significant night-time effect is likely to occur when the effect of lighting is non-defining, and the existing baseline characteristics of the night-time view, area of seascape or landscape continue to provide the defining influence.

1.11.3 Cumulative seascape, landscape and visual effects

Introduction

1.11.3.1 This section should be read in association with section 5.4 cumulative effects assessment (CEA) of Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement. The CEA is concerned with the potential cumulative effects that may result from incremental changes caused by other reasonably foreseeable proposed projects, plans and activities, that were not present at the time of data collection or survey, considered alongside the project in question. It also considers the 'in combination' and 'sequential' effects of adding the same type of development to the existing situation (e.g. would adding a wind farm to an area of seascape that already contains wind farms, change the defining characteristic of the seascape area).

1.11.3.2 GLVIA3 (page 120) defines cumulative landscape and visual effects as those that *'result from additional changes to the landscape and visual amenity caused by the proposal in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.'*

1.11.3.3 The approach to cumulative assessment adopted in this SLVIA and outlined below accords with the recommendations set out in GLVIA3. Both the likely daytime and night-time cumulative effects of the Morgan Generation Assets are considered in the cumulative SLVIA.

1.11.4 Tiered approach to the CEA

1.11.4.1 As stated in paragraph 5.4.3.13 of Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement, a tiered approach to the CEA has been adopted by identifying a set of appropriate 'cumulative development scenarios'. This approach takes into account the different stages that other planned projects are at in the planning/consenting process and the varying potential of each for proceeding to an operational stage, and hence their differing potential to ultimately contribute to a cumulative impact in conjunction with the Morgan Generation Assets.

1.11.4.2 The tiered CEA approach, set out in The Planning Inspectorate Advice Note 17: Cumulative Effects Assessment (2019) has been adopted to assess the complexity of cumulative development scenarios, keeping in mind the principle of proportionality, is summarised as follows:

- Tier 1
 - Under construction
 - Permitted application

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- Submitted application
- Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an on-going impact
- Tier 2
 - Scoping report has been submitted and is in the public domain.
- Tier 3
 - Scoping report has not been submitted
 - Identified in a relevant development plan
 - Identified in other plans and programmes.

1.11.4.3 Advice Note 17 adds a note to the Tier 1 ‘under construction’ category – ‘Where other projects are expected to be completed before construction of the proposed NSIP [Nationally Significant Infrastructure Project] and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline and may be considered as part of both the construction and operational assessment’ (page 6).

1.11.4.4 The development projects selected as relevant to the CEA and included in the SLVIA are based upon the results of a screening exercise and informed by consultations with the relevant authorities (see Volume 3, Annex 5.1: Cumulative effects screening matrix of the Environmental Statement).

1.11.5 Assessing cumulative seascape/landscape and visual effects

1.11.5.1 The same conclusions as to the assessment of sensitivity of the various seascape/landscape and visual receptors are carried forward from the SLVIA and applied in the cumulative SLVIA. The same method as in the SLVIA is used to assess the magnitude and significance of cumulative effect of the Morgan Generation Assets, considered in conjunction with each of the cumulative development scenarios, using the tiered approach set out above.

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Appendix A: Visual Representations

A.1 Visual representations

A.1.1 Overview

A.1.1.1.1 ZTVs and visualisations (wirelines or wirelines and photomontages) are graphical images produced to assist and illustrate the SLVIA and the cumulative assessment. The methodology used for viewpoint photography and photomontages has been produced in accordance with the NatureScot guidance on Visual Representation of Wind Farms, Version 2.2 (2017), the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA 3) (Landscape Institute and IEMA, 2013) and the Landscape Institute Technical Guidance Note on Visual Representation of Development Proposals (2019).

A.1.1.1.2 ZTVs are produced on the assumption that the Morgan Generation Assets wind turbines are modelled relative to Lowest Astronomical Tide (LAT) sea level at their maximum blade tip height (364 m above LAT). The closest tidal stations show LAT as between 4.9 m and 3.85 m Below Ordnance Datum (BOD). As per the MDS, the turbines were modelled at 364 m Above Low Astronomical Tide (LAT).

A.1.2 Zone of Theoretical Visibility

A.1.2.1.1 The ZTVs have been calculated using GIS software to generate a ZTV of Morgan Generation Assets to demonstrate the theoretical extent of visibility from any point in the study area.

A.1.2.1.2 Within England and Wales the Ordnance Survey Terrain 50 Digital Terrain Model (DTM) was used.

A.1.2.1.3 The Isle of Man Government 20 m DTM product was used to provide coverage of the Isle of Man. An issue was identified with data quality in the Snaefell Mountain area and NASA Shuttle Radar Topography Mission data at 1 arcsecond resolution was used to replace this area.

A.1.2.1.4 Each source DTM was reprojected to the UTM Zone 30N coordinate system at a 50m sampling using bilinear interpolation.

A.1.2.1.5 The computer model includes the entire study area and takes account of atmospheric refraction and the Earth's curvature. The resulting ZTV plots have been overlaid on mapping at an appropriate scale and presented as figures using desktop publishing or graphic design software.

A.1.2.1.6 Cumulative ZTV plots based on the intervisibility of the Morgan Generation Assets and other relevant developments within the SLVIA study area have also been produced.

A.1.2.1.7 There are several limitations which should be considered in the interpretation and use of the ZTV, which are as follows:

- The tip height ZTV does not account for the screening effects of existing vegetation or built form
- The ZTVs are based on theoretical visibility from 2 m above ground level
- The blade tip ZTV does not indicate the decrease in visibility that occurs with increased distance from the Morgan Array Area. The nature of what is visible

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from 3 km away will differ markedly from what is visible from 10 km or greater distances away, although both are indicated on the blade tip ZTV as having the same level of visibility

- There is a wide range of variation within the visibility shown on the ZTV. For example, an area shown on the blade tip ZTV as having visibility of seven wind turbines may gain views of the smallest extremity of blade tips, or alternatively of seven full wind turbines. This can make a significant difference in the effects of the Morgan Generation Assets on that area.

A.1.2.1.8 These limitations mean that, while the ZTV is useful as a starting point and aid to assessment, providing an indication of where the Morgan Generation Assets will be theoretically visible, it will tend to present a worst-case or over-estimate the actual visibility. The information drawn from the ZTV is checked by field survey observation and interpreted using professional judgement.

A.1.2.1.9 The SLVIA includes a Horizontal Angle ZTV to show the horizontal field of view (in degrees) that may be affected by views of the wind turbines.

A.1.3 Baseline Photography

A.1.3.1 Overview

A.1.3.1.1 Once a view has been selected, the location is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy.

The following photographic information is recorded:

- Date, time, weather conditions and visual range
- GPS recorded 12 figure grid reference accurate to ~5 to 10 m
- GPS recorded Above Ordnance Datum (AOD) height data
- Use of a fixed 50 millimetre (mm) focal length lens is confirmed
- Horizontal field of view (in degrees)
- Bearing to Morgan Generation Assets.

A.1.3.1.2 The photographs used to produce the photomontages were taken at the locations agreed with the consultees using Canon EOS 5D and 6D Digital SLR cameras, with a fixed lens and a full-frame (35 mm negative size) complementary metal oxide semiconductor (CMOS) sensor. The photographs were taken on a tripod with a panoramic head at a height of approximately 1.5 m above ground level.

A.1.3.1.3 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the offshore elements, based on current information and photomontage methodology.

A.1.3.1.4 This includes GLVIA 3, paragraph 8.22 which states the following with respect to photomontages:

'In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:

representative of those generally prevailing in the area; or

taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible'.

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- A.1.3.1.5 In preparing photomontages for the SLVIA, as far as possible in order to represent when the Morgan Generation Assets may be most visible (a maximum visibility scenario), photographs have been taken in favourable weather conditions during periods of good or better visibility. The time of day that the views were taken was mainly governed by the position of the sun relative to the viewpoint location, and that part of the Morgan Generation Assets for which an existing view photograph was being taken.
- A.1.3.1.6 Various weather forecasts were checked in advance of field survey to ensure favourable weather conditions. These included the Met Office (<https://www.metoffice.gov.uk/>). However, Appendix B: Meteorological office data provides visibility data from Meteorological Office weather stations at Mona (Anglesey), Rhyl No. 2 and Ronaldsway (Isle of Man), which are located in, or close to the SLVIA study area.

A.1.4 Visualisations

- A.1.4.1.1 Wirelines of the Morgan Generation Assets array have been produced in accordance with NatureScot Visual Representation of Windfarms Guidance (NatureScot, 2017) and Landscape Institute (2019) Technical Guidance Note (TGN) 06/19 Visual Representation of Development Proposals (Landscape Institute, September 2019).
- A.1.4.1.2 Wirelines for the Morgan Array Area have been produced to inform the assessment.
- A.1.4.1.3 A photomontage is a visualisation which superimposes an image of a proposed development upon a photograph or series of photographs. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed, as well as being compared and tested with existing views.
- A.1.4.1.4 To create the baseline panorama, individual frames are cylindrically projected and then digitally joined to create a fully cylindrically projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that will result should these frames be arranged in a perspective projection, namely one where the image is not faceted to allow for the cylindrical nature of the full 360° Horizontal Field of View (HFoV) but appears essentially as a flat plane.
- A.1.4.1.5 Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.
- A.1.4.1.6 The baseline photographs and cumulative wireline visualisations shown for each selected viewpoint cover a 90° HFoV (or in some cases, up to 360°), which accords with Visual Representation of Windfarms Guidance (NatureScot, 2017). These are cylindrically projected images and should be viewed flat at a comfortable arm's length.
- A.1.4.1.7 The photographs are also joined to create planar projection panoramas using PTGui software. These are used in the creation of the 53.5° HFoV photomontages.
- A.1.4.1.8 Wireline representations illustrating the Morgan Array Area are set within a computer-generated image of the landform. These are used in the SLVIA to predict the appearance of the wind turbines and assess the likely visual effect. The wirelines are produced with Resoft WindFarm software and are based on OS Terrain 5 DTM. There are limitations in the accuracy of DTM data so that landform may not be picked up precisely and may result in wind turbines being more or less visible than is shown. However, the use of OS Terrain 5 minimises these limitations. Where descriptions within the assessment identify the numbers of wind turbines visible, these refer to the

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illustrations generated (as described above) and therefore the reality on the ground may differ to a minor degree from these impressions.

- A.1.4.1.9 Daytime visualisations and wirelines show a wind turbine model which represents the maximum development scenario of the Morgan Generation Assets in the Morgan Array Area. The visualisations and allows the potential proportions of the wind turbines to be assessed.
- A.1.4.1.10 Fully rendered photomontages have been produced for the agreed viewpoints using Resoft WindFarm software, to provide a photorealistic image of the appearance of the Morgan Generation Assets. Regarding the daytime photomontages, modelled representations are combined with the baseline view photographs to create a photorealistic rendered photomontage image of the development.
- A.1.4.1.11 'Panoramic photomontages' presented in the SLVIA are produced with a 90° HFoV. This format is based on relevant guidance (Landscape Institute Technical Guidance Note 2019) due to its suitability to encompass the horizontal spread of the Morgan Array Area and show the turbines at a representative scale and distance.
- A.1.4.1.12 The 90° HFoV wirelines and photomontages are prepared using a cylindrical projected image and should be viewed at a comfortable arm's length. These images are each printed above and below each other on A1 paper (841 x 594 mm), which provides for a relatively large-scale image and allows both the wireline and photomontage to be viewed simultaneously.
- A.1.4.1.13 In the wirelines, the wind turbines are shown with the central wind turbines facing the viewer directly, with the full rotor diameter visible at its tallest extent. In the photomontages, the wind turbine rotors are shown with a random position with the central wind turbines facing the viewer directly.
- A.1.4.1.14 Rendering of the wind turbines in the photomontages is as photorealistic as possible to the conditions shown in each viewpoint photograph. There may be some variation in the appearance and visibility of the wind turbines between the viewpoints, as they are rendered to suit the conditions shown in each of the different viewpoint photographs, which unavoidably have some degree of variation in terms of lighting and weather conditions. The key requirement is that the wind turbines need to be rendered with sufficient contrast against the skyline backdrop to illustrate the maximum visibility scenario in each image. Photomontages have been prepared to depict the MDS (i.e. most visible) of how the Morgan Array Area will appear. The full suite of viewpoint photomontages should be viewed to gain an impression of the likely visual effects of the Morgan Generation Assets, in the round.

A.1.5 Night-time visualisations

- A.1.5.1.1 The visual effects of the Morgan Generation Assets at night have also been assessed. This has been informed by the night-time photomontage visualisations produced from several representative viewpoints, to visually represent aviation and marine navigation lighting at night.

A.1.6 Information on limitations of visualisations

- A.1.6.1.1 The photographs and other graphic material such as wirelines and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what is now, or will be in the future, apparent to the human eye. The assessments are carried out from

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observations in the field and therefore may include elements that are not visible in the photographs. Limitations of photomontages are set out further below.

A.1.6.1.2 The photomontage visualisations of the Morgan Generation Assets (and any wind farm proposal) have several limitations when using them to form a judgement on visual impact. These include the following:

- A visualisation can never show exactly what the Morgan Generation Assets will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image
- The images provided give a reasonable impression of the scale of the wind turbines and the distance to the wind turbines but can never be 100% accurate
- A static image cannot convey wind turbine movement, or flicker or reflection from the sun on the wind turbine blades as they move
- The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations
- To form the best impression of the impacts of the Morgan Generation Assets proposal these images are best viewed at the viewpoint location shown
- The images must be printed and viewed at the correct size (e.g. 260 mm by 820 mm)
- The images should be held flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, stand at arm's length from the image presented to gain the best impression
- It is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression
- There are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day. The photographs shown in the visualisations show the most favourable weather conditions available during photographic survey work.

A.1.7 Technical Methodology – Visualisations

Table A. 1: Technical Methodology – Visualisations.

Category	Details
Photography	
Visualisation Type	Type 4 – where survey of viewpoint locations is not required
Camera location	Established via hand-held Garmin GPS
Level of accuracy of location	1 to 3 m (depending on satellites)
Camera	Canon EOS 5D Mark II and Canon EOS 6D Digital SLR. Full-frame (35 mm negative size) CMOS sensor
Lens	50 mm fixed f1.4 lens
Tripod	Set to approximately 1.5 m. Nodal Ninja panoramic head with Adjust Leveller. Nodal Ninja panoramic head set to take photographs at 20 degree increments.

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Category	Details
Photography process	Camera used on fully manual settings. Photographs taken in RAW image format. Bracketed exposures are taken for each view and those depicting the clearest images are selected to prepare the panoramic image.
Preparation of panoramic photographs	PTGUI v12.8 is used to join and cylindrically project the images. Adobe Photoshop 2021 used to correct tonal alterations and create an even range of exposure across the photographs so that the individual photographs are not apparent. Planar panoramic images are prepared using Resoft Windfarm software or Hugin Panorma Stitcher.
3D Model/Visualisation	
Topographic height data	Ordnance Survey Terrain 5 (5 m resolution). Ordnance Survey Terrain 50 (50 m resolution).
Use of coordinates in software	Coordinates are brought in from the surveyed GPS coordinates. Positions checked using aerial photography.
Markers for horizontal alignment	Existing offshore windfarms and their known coordinates.
Markers for vertical alignment	Existing offshore wind farms and their known coordinates.
Rendering software	Resoft Windfarm v.5.2.5.3 (wind turbines in wirelines and photomontages). Sketchup or AutoCAD Map 3D 2018 (OSPs, Met Mast and jacket foundations). Autodesk 3ds Max 2018. Visual Nature Studio V 3.10.
Limitations	
Terrain data	There may therefore be local, small-scale landform that is not reflected in the data and subsequently the visualisation but may alter the real visibility of the Morgan Generation Assets, either by screening theoretical visibility or revealing parts of the Morgan Generation Assets that are not theoretically visible
Movement	Static images are unable to capture the movement within the view or of the wind turbines.

Appendix B: Meteorological office data

B.1 Meteorological office visibility data

B.1.1.1 Introduction

B.1.1.1.1 Visibility analysis reports were requested from the four closest Meteorological Office weather stations to the Morgan Array Area:

- Mona, Anglesey (grid reference: 53.26051, -437599)
- Rhyl No.2 (grid reference: 53.2593, -3.50882)
- Ronaldsway, IOM (grid reference: 54.08507, -4.6307)
- Walney Island (grid reference: 54.124387, -3.2577383).

B.1.1.1.2 The analysis reports use ten years of historical data (2012 to 2021). The data is given both as kilometres (km) (broken as follows by the Met Office: 0-0.9 km, 1 to 1.9 km, 2 to 2.9 km, to 70 km or more) and percentages. The data extends beyond 50 km from the Morgan Array Area (i.e. the SLVIA study area).

B.1.1.1.3 The data is divided into bands showing a minimum and maximum distance of visibility. This is further divided into months, giving the number of hours over a ten-year period, where there is visibility within that band. This allows analysis of the different visibility conditions for each month of the year. This allows an estimation of the potential visibility during the holiday seasons.

B.1.1.1.4 The visibility data from the Mona, Rhyl No. 2, Ronaldsway and Walney weather stations are applicable to the Morgan Array Area, as they lie within or are close to the SLVIA study area. The data for each of these four weather stations is set out in Tables B.1 to B.8 below.

B.1.2 Meteorological office explanatory notes

B.1.2.1.1 Visibility is defined as the greatest distance at which an object can be seen and recognized in daylight, or at night if the general illumination were raised to daylight levels. It is typically measured using visTiereter at automatic sites. However, this used to be undertaken by observers at manual stations, except for some Weather Centres and Climate Data Logger stations, where observations are made from a non-standard roof top exposure. The following notes apply:

- Visibility is measured horizontally
- Values are noted in metres (m)
- A dash indicates where data is not available
- A value of 0.0 indicates less than 0.05%.

B.1.3 High level analysis of visibility data

B.1.3.1.1 The closest part of the Morgan Array Area lies:

- Approximately 22.22 km from the closest point on the Isle of Man
- Approximately 37.13 km from the closest point in England
- Approximately 58.5 km from the closest point on the Isle of Anglesey.

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- B.1.3.1.2 The Walney Island dataset was used for England. The Mona and Rhyl datasets have been used for North Wales and the Ronaldsway dataset have been used for visibility from the Isle of Man.

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Table B.1: Walney Island – frequency of visibility.

STATION: Walney Island, Morecambe Bay (NGR: 3178E 4760N, ALT: 15m A.M.S.L)

PERIOD: January 2012 to December 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	108	43	62	65	26	12	2	3	39	13	35	101	509
1 to 1.9	73	67	31	31	18	9	9	9	25	19	48	59	398
2 to 2.9	138	100	90	42	34	32	22	33	50	48	95	115	799
3 to 3.9	147	122	126	57	39	54	57	49	75	97	111	146	1080
4 to 4.9	157	124	155	59	50	66	61	73	77	111	128	166	1227
5 to 5.9	208	153	181	57	58	60	66	56	85	133	136	219	1412
6 to 6.9	233	176	163	69	53	59	59	70	111	127	153	218	1491
7 to 7.9	291	211	190	96	65	68	85	62	110	140	189	290	1797
8 to 8.9	326	219	228	127	82	74	75	82	100	131	156	293	1893
9 to 9.9	336	254	287	125	109	72	86	85	132	190	183	312	2171
10 to 10.9	381	293	284	134	105	101	85	115	173	176	182	326	2355
11 to 11.9	344	271	275	135	101	113	96	111	170	199	204	307	2326
12 to 12.9	343	284	244	153	128	129	121	132	165	194	201	328	2422
13 to 13.9	349	283	214	161	132	143	125	109	183	207	217	303	2426
14 to 14.9	287	282	239	146	144	134	121	141	178	207	218	279	2376
15 to 15.9	278	252	209	151	160	123	110	132	174	195	211	295	2290
16 to 16.9	254	225	204	136	144	141	120	127	180	186	199	243	2159
17 to 17.9	223	217	204	157	158	149	124	134	164	158	188	208	2084
18 to 18.9	194	178	212	141	132	142	124	142	179	171	166	198	1979
19 to 19.9	177	187	161	153	133	136	135	173	160	173	169	210	1967

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Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	196	167	165	156	117	124	111	163	161	163	150	168	1841
21 to 21.9	150	132	150	144	148	130	121	134	166	159	172	158	1764
22 to 22.9	151	114	124	137	144	144	132	148	141	115	123	131	1604
23 to 23.9	118	98	128	121	143	159	129	138	149	155	127	129	1594
24 to 24.9	118	107	95	109	147	133	130	137	136	137	132	141	1522
25 to 25.9	94	97	122	112	130	141	143	157	144	130	122	93	1485
26 to 26.9	89	94	90	105	139	139	159	127	153	142	111	112	1460
27 to 27.9	67	88	105	114	139	152	138	143	137	114	98	107	1402
28 to 28.9	66	76	99	130	136	143	126	138	141	111	112	99	1377
29 to 29.9	64	92	92	117	123	119	157	153	128	105	103	71	1324
30 to 34.9	363	344	447	477	696	660	690	688	619	545	498	337	6364
35 to 39.9	259	316	356	548	672	637	755	662	606	541	465	278	6095
40 to 44.9	238	327	407	525	686	612	739	619	585	572	452	261	6023
45 to 49.9	233	321	382	621	644	668	750	659	607	654	510	298	6347
50 to 59.9	380	476	437	867	757	697	721	725	728	914	832	439	7973
60 to 69.9	0	0	0	0	0	0	0	0	0	0	0	0	0
>= 70	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL OBS	7433	6790	6958	6478	6692	6475	6684	6629	7131	7432	7196	7438	83336

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Table B.2: Walney Island – percentage visibility.

STATION: Walney Island, Morecambe Bay (NGR: 3178E 4760N, ALT: 15m A.M.S.L)

PERIOD: January 2012 to December 2021

Visibility (km)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	1.45	0.63	0.89	1.00	0.39	0.19	0.03	0.05	0.55	0.17	0.49	1.36	0.61
1 to 1.9	0.98	0.99	0.45	0.48	0.27	0.14	0.13	0.14	0.35	0.26	0.67	0.79	0.48
2 to 2.9	1.86	1.47	1.29	0.65	0.51	0.49	0.33	0.50	0.70	0.65	1.32	1.55	0.96
3 to 3.9	1.98	1.80	1.81	0.88	0.58	0.83	0.85	0.74	1.05	1.31	1.54	1.96	1.30
4 to 4.9	2.11	1.83	2.23	0.91	0.75	1.02	0.91	1.10	1.08	1.49	1.78	2.23	1.47
5 to 5.9	2.80	2.25	2.60	0.88	0.87	0.93	0.99	0.84	1.19	1.79	1.89	2.94	1.69
6 to 6.9	3.13	2.59	2.34	1.07	0.79	0.91	0.88	1.06	1.56	1.71	2.13	2.93	1.79
7 to 7.9	3.91	3.11	2.73	1.48	0.97	1.05	1.27	0.94	1.54	1.88	2.63	3.90	2.16
8 to 8.9	4.39	3.23	3.28	1.96	1.23	1.14	1.12	1.24	1.40	1.76	2.17	3.94	2.27
9 to 9.9	4.52	3.74	4.12	1.93	1.63	1.11	1.29	1.28	1.85	2.56	2.54	4.19	2.61
10 to 10.9	5.13	4.32	4.08	2.07	1.57	1.56	1.27	1.73	2.43	2.37	2.53	4.38	2.83
11 to 11.9	4.63	3.99	3.95	2.08	1.51	1.75	1.44	1.67	2.38	2.68	2.83	4.13	2.79
12 to 12.9	4.61	4.18	3.51	2.36	1.91	1.99	1.81	1.99	2.31	2.61	2.79	4.41	2.91
13 to 13.9	4.70	4.17	3.08	2.49	1.97	2.21	1.87	1.64	2.57	2.79	3.02	4.07	2.91
14 to 14.9	3.86	4.15	3.43	2.25	2.15	2.07	1.81	2.13	2.50	2.79	3.03	3.75	2.85
15 to 15.9	3.74	3.71	3.00	2.33	2.39	1.90	1.65	1.99	2.44	2.62	2.93	3.97	2.75
16 to 16.9	3.42	3.31	2.93	2.10	2.15	2.18	1.80	1.92	2.52	2.50	2.77	3.27	2.59
17 to 17.9	3.00	3.20	2.93	2.42	2.36	2.30	1.86	2.02	2.30	2.13	2.61	2.80	2.50
18 to 18.9	2.61	2.62	3.05	2.18	1.97	2.19	1.86	2.14	2.51	2.30	2.31	2.66	2.37
19 to 19.9	2.38	2.75	2.31	2.36	1.99	2.10	2.02	2.61	2.24	2.33	2.35	2.82	2.36

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Visibility (km)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	2.64	2.46	2.37	2.41	1.75	1.92	1.66	2.46	2.26	2.19	2.08	2.26	2.21
21 to 21.9	2.02	1.94	2.16	2.22	2.21	2.01	1.81	2.02	2.33	2.14	2.39	2.12	2.12
22 to 22.9	2.03	1.68	1.78	2.11	2.15	2.22	1.97	2.23	1.98	1.55	1.71	1.76	1.92
23 to 23.9	1.59	1.44	1.84	1.87	2.14	2.46	1.93	2.08	2.09	2.09	1.76	1.73	1.91
24 to 24.9	1.59	1.58	1.37	1.68	2.20	2.05	1.94	2.07	1.91	1.84	1.83	1.90	1.83
25 to 25.9	1.26	1.43	1.75	1.73	1.94	2.18	2.14	2.37	2.02	1.75	1.70	1.25	1.78
26 to 26.9	1.20	1.38	1.29	1.62	2.08	2.15	2.38	1.92	2.15	1.91	1.54	1.51	1.75
27 to 27.9	0.90	1.30	1.51	1.76	2.08	2.35	2.06	2.16	1.92	1.53	1.36	1.44	1.68
28 to 28.9	0.89	1.12	1.42	2.01	2.03	2.21	1.89	2.08	1.98	1.49	1.56	1.33	1.65
29 to 29.9	0.86	1.35	1.32	1.81	1.84	1.84	2.35	2.31	1.79	1.41	1.43	0.95	1.59
30 to 34.9	4.88	5.07	6.42	7.36	10.40	10.19	10.32	10.38	8.68	7.33	6.92	4.53	7.64
35 to 39.9	3.48	4.65	5.12	8.46	10.04	9.84	11.30	9.99	8.50	7.28	6.46	3.74	7.31
40 to 44.9	3.20	4.82	5.85	8.10	10.25	9.45	11.06	9.34	8.20	7.70	6.28	3.51	7.23
45 to 49.9	3.13	4.73	5.49	9.59	9.62	10.32	11.22	9.94	8.51	8.80	7.09	4.01	7.62
50 to 59.9	5.11	7.01	6.28	13.38	11.31	10.76	10.79	10.94	10.21	12.30	11.56	5.90	9.57
60 to 69.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>= 70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALL OBS	100	100	100	100	100	100	100	100	100	100	100	100	100

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS
Table B.3: Mona – frequency of visibility.

STATION: MONA (NGR: 2416E 3763N, ALT: 60m A.M.S.L)

PERIOD: Jan 2012 to Dec 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	130	76	118	77	81	76	102	133	157	64	78	142	1234
1 to 1.9	86	82	95	70	35	51	75	54	81	44	46	61	780
2 to 2.9	147	131	200	100	76	97	109	103	123	95	107	117	1405
3 to 3.9	160	144	212	133	109	98	117	109	153	119	112	142	1608
4 to 4.9	154	155	227	172	118	136	127	102	121	116	132	167	1727
5 to 5.9	151	155	230	156	126	141	154	99	153	116	141	161	1783
6 to 6.9	204	180	223	176	148	171	144	133	124	115	148	132	1898
7 to 7.9	182	196	204	182	166	187	176	155	144	132	157	159	2040
8 to 8.9	164	175	253	200	203	178	223	180	176	138	153	193	2236
9 to 9.9	223	187	236	211	218	215	229	160	166	135	153	210	2343
10 to 10.9	236	259	291	216	234	207	263	185	178	176	145	199	2589
11 to 11.9	227	224	248	239	224	236	263	203	207	175	166	195	2607
12 to 12.9	264	255	312	212	294	301	286	242	205	207	180	249	3007
13 to 13.9	249	276	314	231	277	349	306	290	230	255	182	214	3173
14 to 14.9	317	257	342	254	355	354	358	266	225	236	205	294	3463
15 to 15.9	306	285	359	267	388	336	269	317	233	286	212	304	3562
16 to 16.9	316	293	352	252	403	338	292	291	263	320	254	319	3693
17 to 17.9	309	334	346	252	366	358	296	338	237	302	247	321	3706
18 to 18.9	262	292	290	257	350	337	287	345	239	311	285	277	3532
19 to 19.9	288	261	234	279	340	345	301	300	251	319	251	282	3451

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	268	240	209	220	322	323	322	317	243	317	293	265	3339
21 to 21.9	217	187	216	234	291	320	293	313	238	339	280	276	3204
22 to 22.9	184	200	206	244	301	257	252	284	247	288	258	223	2944
23 to 23.9	173	175	166	227	260	252	264	264	250	300	232	201	2764
24 to 24.9	160	150	145	227	216	234	231	232	223	260	226	200	2504
25 to 25.9	141	152	128	223	218	182	222	256	253	266	213	204	2458
26 to 26.9	139	160	132	184	207	162	200	199	226	236	205	159	2209
27 to 27.9	132	132	107	176	189	162	200	232	222	237	186	154	2129
28 to 28.9	116	137	112	200	152	151	196	175	202	215	178	120	1954
29 to 29.9	95	136	100	180	141	124	146	169	175	183	154	122	1725
30 to 34.9	488	419	401	543	446	357	520	511	731	712	585	461	6174
35 to 39.9	313	240	194	289	127	120	155	260	326	281	383	320	3008
40 to 44.9	213	129	108	126	27	32	40	114	122	81	186	217	1395
45 to 49.9	152	73	60	49	9	3	13	34	21	27	154	136	731
50 to 59.9	184	33	49	40	7	3	2	10	6	16	191	142	683
60 to 69.9	64	8	12	20	4	0	0	1	1	4	67	66	247
>= 70	11	0	0	0	0	0	0	0	0	0	21	8	40
ALL OBS	7425	6788	7431	7118	7428	7193	7433	7376	7152	7423	7166	7412	87345

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS
Table B.4: Mona – percentage visibility.

STATION: MONA (NGR: 2994e 3746n, ALT: 77m A.M.S.L)

PERIOD: Jan 2012 to Dec 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	1.75	1.12	1.59	1.08	1.09	1.06	1.37	1.80	2.20	0.86	1.09	1.92	1.41
1 to 1.9	1.16	1.21	1.28	0.98	0.47	0.71	1.01	0.73	1.13	0.59	0.64	0.82	0.89
2 to 2.9	1.98	1.93	2.69	1.40	1.02	1.35	1.47	1.40	1.72	1.28	1.49	1.58	1.61
3 to 3.9	2.15	2.12	2.85	1.87	1.47	1.36	1.57	1.48	2.14	1.60	1.56	1.92	1.84
4 to 4.9	2.07	2.28	3.05	2.42	1.59	1.89	1.71	1.38	1.69	1.56	1.84	2.25	1.98
5 to 5.9	2.03	2.28	3.10	2.19	1.70	1.96	2.07	1.34	2.14	1.56	1.97	2.17	2.04
6 to 6.9	2.75	2.65	3.00	2.47	1.99	2.38	1.94	1.80	1.73	1.55	2.07	1.78	2.17
7 to 7.9	2.45	2.89	2.75	2.56	2.23	2.60	2.37	2.10	2.01	1.78	2.19	2.15	2.34
8 to 8.9	2.21	2.58	3.40	2.81	2.73	2.47	3.00	2.44	2.46	1.86	2.14	2.60	2.56
9 to 9.9	3.00	2.75	3.18	2.96	2.93	2.99	3.08	2.17	2.32	1.82	2.14	2.83	2.68
10 to 10.9	3.18	3.82	3.92	3.03	3.15	2.88	3.54	2.51	2.49	2.37	2.02	2.68	2.96
11 to 11.9	3.06	3.30	3.34	3.36	3.02	3.28	3.54	2.75	2.89	2.36	2.32	2.63	2.98
12 to 12.9	3.56	3.76	4.20	2.98	3.96	4.18	3.85	3.28	2.87	2.79	2.51	3.36	3.44
13 to 13.9	3.35	4.07	4.23	3.25	3.73	4.85	4.12	3.93	3.22	3.44	2.54	2.89	3.63
14 to 14.9	4.27	3.79	4.60	3.57	4.78	4.92	4.82	3.61	3.15	3.18	2.86	3.97	3.96
15 to 15.9	4.12	4.20	4.83	3.75	5.22	4.67	3.62	4.30	3.26	3.85	2.96	4.10	4.08
16 to 16.9	4.26	4.32	4.74	3.54	5.43	4.70	3.93	3.95	3.68	4.31	3.54	4.30	4.23
17 to 17.9	4.16	4.92	4.66	3.54	4.93	4.98	3.98	4.58	3.31	4.07	3.45	4.33	4.24
18 to 18.9	3.53	4.30	3.90	3.61	4.71	4.69	3.86	4.68	3.34	4.19	3.98	3.74	4.04
19 to 19.9	3.88	3.85	3.15	3.92	4.58	4.80	4.05	4.07	3.51	4.30	3.50	3.80	3.95

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	3.61	3.54	2.81	3.09	4.33	4.49	4.33	4.30	3.40	4.27	4.09	3.58	3.82
21 to 21.9	2.92	2.75	2.91	3.29	3.92	4.45	3.94	4.24	3.33	4.57	3.91	3.72	3.67
22 to 22.9	2.48	2.95	2.77	3.43	4.05	3.57	3.39	3.85	3.45	3.88	3.60	3.01	3.37
23 to 23.9	2.33	2.58	2.23	3.19	3.50	3.50	3.55	3.58	3.50	4.04	3.24	2.71	3.16
24 to 24.9	2.15	2.21	1.95	3.19	2.91	3.25	3.11	3.15	3.12	3.50	3.15	2.70	2.87
25 to 25.9	1.90	2.24	1.72	3.13	2.93	2.53	2.99	3.47	3.54	3.58	2.97	2.75	2.81
26 to 26.9	1.87	2.36	1.78	2.58	2.79	2.25	2.69	2.70	3.16	3.18	2.86	2.15	2.53
27 to 27.9	1.78	1.94	1.44	2.47	2.54	2.25	2.69	3.15	3.10	3.19	2.60	2.08	2.44
28 to 28.9	1.56	2.02	1.51	2.81	2.05	2.10	2.64	2.37	2.82	2.90	2.48	1.62	2.24
29 to 29.9	1.28	2.00	1.35	2.53	1.90	1.72	1.96	2.29	2.45	2.47	2.15	1.65	1.97
30 to 3 49	6.57	6.17	5.40	7.63	6.00	4.96	7.00	6.93	10.22	9.59	8.16	6.22	7.07
35 to 39.9	4.22	3.54	2.61	4.06	1.71	1.67	2.09	3.52	4.56	3.79	5.34	4.32	3.44
40 to 44.9	2.87	1.90	1.45	1.77	0.36	0.44	0.54	1.55	1.71	1.09	2.60	2.93	1.60
45 to 49.9	2.05	1.08	0.81	0.69	0.12	0.04	0.17	0.46	0.29	0.36	2.15	1.83	0.84
50 to 59.9	2.48	0.49	0.66	0.56	0.09	0.04	0.03	0.14	0.08	0.22	2.67	1.92	0.78
60000 to 69999	0.86	0.12	0.16	0.28	0.05	0.00	0.00	0.01	0.01	0.05	0.93	0.89	0.28
>= 70	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.11	0.05
ALL OBS	100	100	100	100	100	100	100	100	100	100	100	100	100

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS
Table B.5: Rhyl No.2 – frequency of visibility.

STATION: RHYL NO.2 (NGR: 2994e 3746n, ALT: 77m A.M.S.L)

PERIOD: Jan 2012 to Dec 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	13	29	29	28	12	13	18	11	30	9	8	34	234
1 to 1.9	34	36	45	29	16	47	44	46	39	29	29	33	427
2 to 2.9	60	51	83	47	36	75	63	54	77	63	48	60	717
3 to 3.9	79	71	141	72	55	81	62	71	83	63	64	60	902
4 to 4.9	75	69	155	91	72	101	62	76	101	71	84	75	1032
5 to 5.9	103	86	155	96	70	85	67	78	138	71	114	72	1135
6 to 6.9	118	106	130	121	86	106	65	63	125	96	116	91	1223
7 to 7.9	99	71	129	122	100	81	75	99	147	106	134	94	1257
8 to 8.9	115	130	185	142	91	87	94	93	164	167	146	85	1499
9 to 9.9	140	128	160	113	115	86	82	100	152	111	108	90	1385
10 to 10.9	104	101	140	103	95	83	74	85	119	137	109	97	1247
11 to 11.9	137	102	152	85	110	85	100	101	137	127	107	83	1326
12 to 12.9	104	117	148	105	106	114	106	116	149	125	117	105	1412
13 to 13.9	140	120	126	120	114	83	111	99	117	138	113	73	1354
14 to 14.9	127	115	114	115	104	112	103	99	134	141	117	106	1387
15 to 15.9	139	126	134	133	102	130	120	108	165	133	105	115	1510
16 to 16.9	128	150	126	129	106	166	148	130	183	163	103	139	1671
17 to 17.9	170	146	125	134	139	210	151	189	185	158	126	166	1899
18 to 18.9	171	149	175	131	151	236	164	156	160	159	122	122	1896
19 to 19.9	172	142	138	127	122	212	171	154	175	167	123	115	1818

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	161	122	157	146	153	210	142	146	154	201	121	117	1830
21 to 21.9	155	145	149	133	130	183	150	142	146	161	118	166	1778
22 to 22.9	138	120	144	132	129	206	128	141	156	166	101	119	1680
23 to 23.9	140	114	153	122	145	192	145	144	135	156	108	149	1703
24 to 24.9	167	141	171	119	136	171	149	118	141	162	112	138	1725
25 to 25.9	167	168	143	122	142	182	128	128	117	173	129	143	1742
26 to 26.9	171	163	137	156	138	153	137	140	126	165	109	149	1744
27 to 27.9	175	163	129	124	142	140	129	121	127	166	120	144	1680
28 to 28.9	173	170	138	130	132	138	171	145	127	156	133	184	1797
29 to 29.9	173	154	117	136	153	156	142	138	130	170	113	176	1758
30 to 34.9	871	735	715	665	791	741	740	772	562	730	675	895	8892
35 to 39.9	711	668	662	676	791	625	703	752	548	683	730	902	8451
40 to 44.9	523	534	580	652	788	466	570	636	438	606	706	797	7296
45 to 49.9	398	363	449	520	597	338	432	397	323	394	532	459	5202
50 to 59.9	660	638	751	961	953	695	1104	1099	794	771	827	905	10158
60 to 69.9	124	112	132	141	193	78	166	98	59	117	139	92	1451
>= 70	143	119	119	94	104	78	144	122	67	125	187	87	1389
ALL OBS	7278	6674	7436	7072	7419	6945	7160	7167	6730	7336	6953	7437	85607

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table B.6: Rhyl No. 2 - percentage visibility.

STATION: RHYL No. 2 (NGR: 2279E 4686N, ALT: 16m A.M.S.L)

PERIOD: Jan 2012 to Dec 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	0.18	0.43	0.39	0.40	0.16	0.19	0.25	0.15	0.45	0.12	0.12	0.46	0.27
1 to 1.9	0.47	0.54	0.61	0.41	0.22	0.68	0.61	0.64	0.58	0.40	0.42	0.44	0.50
2 to 2.9	0.82	0.76	1.12	0.66	0.49	1.08	0.88	0.75	1.14	0.86	0.69	0.81	0.84
3 to 3.9	1.09	1.06	1.90	1.02	0.74	1.17	0.87	0.99	1.23	0.86	0.92	0.81	1.05
4 to 4.9	1.03	1.03	2.08	1.29	0.97	1.45	0.87	1.06	1.50	0.97	1.21	1.01	1.21
5 to 5.9	1.42	1.29	2.08	1.36	0.94	1.22	0.94	1.09	2.05	0.97	1.64	0.97	1.33
6 to 6.9	1.62	1.59	1.75	1.71	1.16	1.53	0.91	0.88	1.86	1.31	1.67	1.22	1.43
7 to 7.9	1.36	1.06	1.73	1.73	1.35	1.17	1.05	1.38	2.18	1.44	1.93	1.26	1.47
8 to 8.9	1.58	1.95	2.49	2.01	1.23	1.25	1.31	1.30	2.44	2.28	2.10	1.14	1.75
9 to 9.9	1.92	1.92	2.15	1.60	1.55	1.24	1.15	1.40	2.26	1.51	1.55	1.21	1.62
10 to 10.9	1.43	1.51	1.88	1.46	1.28	1.20	1.03	1.19	1.77	1.87	1.57	1.30	1.46
11 to 11.9	1.88	1.53	2.04	1.20	1.48	1.22	1.40	1.41	2.04	1.73	1.54	1.12	1.55
12 to 12.9	1.43	1.75	1.99	1.48	1.43	1.64	1.48	1.62	2.21	1.70	1.68	1.41	1.65
13 to 13.9	1.92	1.80	1.69	1.70	1.54	1.20	1.55	1.38	1.74	1.88	1.63	0.98	1.58
14 to 14.9	1.74	1.72	1.53	1.63	1.40	1.61	1.44	1.38	1.99	1.92	1.68	1.43	1.62
15 to 15.9	1.91	1.89	1.80	1.88	1.37	1.87	1.68	1.51	2.45	1.81	1.51	1.55	1.76
16 to 16.9	1.76	2.25	1.69	1.82	1.43	2.39	2.07	1.81	2.72	2.22	1.48	1.87	1.95
17 to 17.9	2.34	2.19	1.68	1.89	1.87	3.02	2.11	2.64	2.75	2.15	1.81	2.23	2.22
18 to 18.9	2.35	2.23	2.35	1.85	2.04	3.40	2.29	2.18	2.38	2.17	1.75	1.64	2.21
19 to 19.9	2.36	2.13	1.86	1.80	1.64	3.05	2.39	2.15	2.60	2.28	1.77	1.55	2.12

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	2.21	1.83	2.11	2.06	2.06	3.02	1.98	2.04	2.29	2.74	1.74	1.57	2.14
21 to 21.9	2.13	2.17	2.00	1.88	1.75	2.63	2.09	1.98	2.17	2.19	1.70	2.23	2.08
22 to 22.9	1.90	1.80	1.94	1.87	1.74	2.97	1.79	1.97	2.32	2.26	1.45	1.60	1.96
23 to 23.9	1.92	1.71	2.06	1.73	1.95	2.76	2.03	2.01	2.01	2.13	1.55	2.00	1.99
24 to 24.9	2.29	2.11	2.30	1.68	1.83	2.46	2.08	1.65	2.10	2.21	1.61	1.86	2.02
25 to 25.9	2.29	2.52	1.92	1.73	1.91	2.62	1.79	1.79	1.74	2.36	1.86	1.92	2.03
26 to 26.9	2.35	2.44	1.84	2.21	1.86	2.20	1.91	1.95	1.87	2.25	1.57	2.00	2.04
27 to 27.9	2.40	2.44	1.73	1.75	1.91	2.02	1.80	1.69	1.89	2.26	1.73	1.94	1.96
28 to 28.9	2.38	2.55	1.86	1.84	1.78	1.99	2.39	2.02	1.89	2.13	1.91	2.47	2.10
29 to 29.9	2.38	2.31	1.57	1.92	2.06	2.25	1.98	1.93	1.93	2.32	1.63	2.37	2.05
30 to 34.9	11.97	11.01	9.62	9.40	10.66	10.67	10.34	10.77	8.35	9.95	9.71	12.03	10.39
35 to 39.9	9.77	10.01	8.90	9.56	10.66	9.00	9.82	10.49	8.14	9.31	10.50	12.13	9.87
40 to 44.9	7.19	8.00	7.80	9.22	10.62	6.71	7.96	8.87	6.51	8.26	10.15	10.72	8.52
45 to 49.9	5.47	5.44	6.04	7.35	8.05	4.87	6.03	5.54	4.80	5.37	7.65	6.17	6.08
50 to 59.9	9.07	9.56	10.10	13.59	12.85	10.01	15.42	15.33	11.80	10.51	11.89	12.17	11.87
60 to 69.9	1.70	1.68	1.78	1.99	2.60	1.12	2.32	1.37	0.88	1.59	2.00	1.24	1.69
>= 70	1.96	1.78	1.60	1.33	1.40	1.12	2.01	1.70	1.00	1.70	2.69	1.17	1.62
ALL OBS	100	100	100	100	100	100	100	100	100	100	100	100	100

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table B.7: Ronaldsway – frequency of visibility.

STATION: RONALDSWAY (NGR: 2279E 4686N, ALT: 16m A.M.S.L)

PERIOD: Jan 2012 to Dec 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	24	28	81	80	71	94	109	96	71	23	21	18	716
1 to 1.9	8	13	26	24	35	31	46	42	23	4	7	9	268
2 to 2.9	38	57	54	41	35	62	78	52	43	31	39	53	583
3 to 3.9	112	113	146	114	89	105	136	110	111	112	101	135	1384
4 to 4.9	144	160	177	108	106	124	108	85	109	112	99	157	1489
5 to 5.9	169	164	239	128	91	159	114	108	123	136	154	227	1812
6 to 6.9	130	150	206	97	97	118	116	92	110	97	117	173	1503
7 to 7.9	119	115	159	88	75	104	94	81	99	96	111	128	1269
8 to 8.9	233	297	269	191	146	171	165	138	184	253	217	263	2527
9 to 9.9	96	106	118	109	86	94	89	74	93	93	114	114	1186
10 to 10.9	318	278	260	230	215	189	232	192	278	224	221	250	2887
11 to 11.9	3	3	6	12	4	6	5	6	1	4	4	4	58
12 to 12.9	327	313	302	311	245	281	256	270	256	261	259	294	3375
13 to 13.9	20	21	19	36	21	19	9	22	39	15	9	25	255
14 to 14.9	21	29	25	12	25	25	10	14	15	14	10	9	209
15 to 15.9	650	677	615	516	512	515	532	540	489	555	489	591	6681
16 to 16.9	3	0	0	1	0	2	5	0	3	0	0	9	23
17 to 17.9	14	16	19	14	13	11	7	13	4	6	6	4	127
18 to 18.9	121	129	136	110	140	141	118	134	130	79	94	88	1420
19 to 19.9	0	0	0	0	0	0	0	0	0	0	0	0	0

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Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	1051	1010	800	708	848	841	748	1002	791	743	702	966	10210
21 to 21.9	0	0	0	0	0	0	0	0	0	0	0	0	0
22 to 22.9	12	13	10	14	11	23	16	12	17	19	12	12	171
23 to 23.9	0	0	0	0	0	1	0	0	0	0	0	0	1
24 to 24.9	2	0	1	1	0	0	0	0	2	0	0	1	7
25 to 25.9	975	773	837	695	821	828	713	881	704	803	748	870	9648
26 to 26.9	0	0	0	0	0	0	0	0	0	0	0	0	0
27 to 27.9	0	0	0	0	0	0	0	0	0	0	0	0	0
28 to 28.9	0	0	0	0	1	0	1	0	0	0	0	1	3
29 to 29.9	0	0	0	0	0	0	0	0	1	0	0	0	1
30 to 34.9	1298	1046	1354	1252	1485	1256	1316	1366	1438	1324	1305	1419	15859
35 to 39.9	50	20	33	41	33	25	22	15	33	31	59	66	428
40 to 44.9	1013	797	1016	1324	1285	1238	1527	1315	1324	1451	1425	972	14687
45 to 49.9	2	7	11	9	9	1	1	1	1	4	7	6	59
50 to 59.9	366	327	354	603	653	546	680	571	501	623	623	400	6247
60 to 69.9	65	80	86	214	106	100	91	130	116	147	122	82	1339
>= 70	4	9	15	28	10	22	23	11	31	45	42	11	251
ALL OBS	7388	6751	7374	7111	7268	7132	7367	7373	7140	7305	7117	7357	86683

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Table B.8: Ronaldsway – percentage visibility.

STATION: RONALDSWAY (NGR: 2279E 4686N, ALT: 16m A.M.S.L)

PERIOD: Jan 2012 to Dec 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
< 1	0.32	0.41	1.10	1.13	0.98	1.32	1.48	1.30	0.99	0.31	0.30	0.24	0.83
1 to 1.9	0.11	0.19	0.35	0.34	0.48	0.43	0.62	0.57	0.32	0.05	0.10	0.12	0.31
2 to 2.9	0.51	0.84	0.73	0.58	0.48	0.87	1.06	0.71	0.60	0.42	0.55	0.72	0.67
3 to 3.9	1.52	1.67	1.98	1.60	1.22	1.47	1.85	1.49	1.55	1.53	1.42	1.83	1.60
4 to 4.9	1.95	2.37	2.40	1.52	1.46	1.74	1.47	1.15	1.53	1.53	1.39	2.13	1.72
5 to 5.9	2.29	2.43	3.24	1.80	1.25	2.23	1.55	1.46	1.72	1.86	2.16	3.09	2.09
6 to 6.9	1.76	2.22	2.79	1.36	1.33	1.65	1.57	1.25	1.54	1.33	1.64	2.35	1.73
7 to 7.9	1.61	1.70	2.16	1.24	1.03	1.46	1.28	1.10	1.39	1.31	1.56	1.74	1.46
8 to 8.9	3.15	4.40	3.65	2.69	2.01	2.40	2.24	1.87	2.58	3.46	3.05	3.57	2.92
9 to 9.9	1.30	1.57	1.60	1.53	1.18	1.32	1.21	1.00	1.30	1.27	1.60	1.55	1.37
10 to 10.9	4.30	4.12	3.53	3.23	2.96	2.65	3.15	2.60	3.89	3.07	3.11	3.40	3.33
11 to 11.9	0.04	0.04	0.08	0.17	0.06	0.08	0.07	0.08	0.01	0.05	0.06	0.05	0.07
12 to 12.9	4.43	4.64	4.10	4.37	3.37	3.94	3.47	3.66	3.59	3.57	3.64	4.00	3.89
13 to 13.9	0.27	0.31	0.26	0.51	0.29	0.27	0.12	0.30	0.55	0.21	0.13	0.34	0.29
14 to 14.9	0.28	0.43	0.34	0.17	0.34	0.35	0.14	0.19	0.21	0.19	0.14	0.12	0.24
15 to 15.9	8.80	10.03	8.34	7.26	7.04	7.22	7.22	7.32	6.85	7.60	6.87	8.03	7.71
16 to 16.9	0.04	0.00	0.00	0.01	0.00	0.03	0.07	0.00	0.04	0.00	0.00	0.12	0.03
17 to 17.9	0.19	0.24	0.26	0.20	0.18	0.15	0.10	0.18	0.06	0.08	0.08	0.05	0.15
18 to 18.9	1.64	1.91	1.84	1.55	1.93	1.98	1.60	1.82	1.82	1.08	1.32	1.20	1.64
19 to 19.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ALL OBS
20 to 20.9	14.23	14.96	10.85	9.96	11.67	11.79	10.15	13.59	11.08	10.17	9.86	13.13	11.78
21 to 21.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22 to 22.9	0.16	0.19	0.14	0.20	0.15	0.32	0.22	0.16	0.24	0.26	0.17	0.16	0.20
23 to 23.9	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24 to 24.9	0.03	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.01
25 to 25.9	13.20	11.45	11.35	9.77	11.30	11.61	9.68	11.95	9.86	10.99	10.51	11.83	11.13
26 to 26.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27 to 27.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28 to 28.9	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00
29 to 29.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
30 to 34.9	17.57	15.49	18.36	17.61	20.43	17.61	17.86	18.53	20.14	18.12	18.34	19.29	18.30
35 to 39.9	0.68	0.30	0.45	0.58	0.45	0.35	0.30	0.20	0.46	0.42	0.83	0.90	0.49
40 to 44.9	13.71	11.81	13.78	18.62	17.68	17.36	20.73	17.84	18.54	19.86	20.02	13.21	16.94
45 to 49.9	0.03	0.10	0.15	0.13	0.12	0.01	0.01	0.01	0.01	0.05	0.10	0.08	0.07
50 to 59.9	4.95	4.84	4.80	8.48	8.98	7.66	9.23	7.74	7.02	8.53	8.75	5.44	7.21
60 to 69.9	0.88	1.19	1.17	3.01	1.46	1.40	1.24	1.76	1.62	2.01	1.71	1.11	1.54
>= 70	0.05	0.13	0.20	0.39	0.14	0.31	0.31	0.15	0.43	0.62	0.59	0.15	0.29
ALL OBS	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix C: Landscape and Seascape Value and Susceptibility of Landscapes and Seascapes

C.1 Evaluation Tables

C.1.1 Overview

C.1.1.1.1 Table C. 1 is a proforma valuation table for assessing the qualities and perceptual aspects of landscapes and seascapes.

Table C. 1: Landscape and Seascape Value.

Name of landscape/seascape character area/type/unit				
Landscape/seascape value factor	Lower value	Higher value	Evaluation description	Value/factor judgement
Scenic quality designation	Absence of designation	International or national designation		
Natural heritage	Infrequent or limited presence or evidence of features of ecological, geological, geomorphological or physiographic interest.	High or frequent presence or evidence of features of ecological, geological, geomorphological or physiographic interest.		
Cultural heritage	Infrequent or limited presence or evidence of features of archaeological or historic interest.	High or frequent presence or evidence of features of archaeological or historic interest.		
Landscape/seascape condition	Landscape/seascape is in unfavourable or vulnerable condition.	Landscape/seascape is in favourable or stable/strong condition.		
Cultural associations	No or weak association with notable people, events and the arts or science.	No or weak association with notable people, events and the arts or science that influence perceptions of the landscape.		

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Name of landscape/seascape character area/type/unit

Landscape/seascape value factor	Lower value	Higher value	Evaluation description	Value/factor judgement
Distinctiveness	Commonplace elements and features, or character. Lacking distinctive and strongly expressed identity and with no important relationship to a settlement.	Presence of rare elements or features or rare example of landscape character. Landscape with a distinctive and clearly expressed character/identity and/or with an important relationship to a settlement.		
Amenity and recreation	Limited recreational opportunities where experience of landscape is important.	Evidence of many recreational opportunities where experience of landscape is important.		
Perceptual (scenic)	Landscape of limited or no scenic or visual appeal.	Landscape with high scenic or visual appeal.		
Perceptual (wildness and tranquillity)	Strongly influenced by human activities. Absence or limited dark night skies.	Limited influence of human activities. Presence of dark night skies or very limited illumination.		
Function	No or limited identifiable landscape function. No physical or functional link to adjacent national designated landscape.	Readily identifiable landscape function. Evidence of physical or functional link to adjacent national designated landscape.		
Overall judgement of value				

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Table C. 2: Landscape and Seascape Susceptibility.

Name of landscape/seascape character area/type/unit				
Landscape/seascape susceptibility factor	Lower susceptibility	Higher susceptibility	Evaluation description	Susceptibility/factor judgement
Scale	Large scale landscapes may be less susceptible to change from wind turbines	Small scale landscapes are likely to be more susceptible to change from wind turbines		
Landform/topography	Level or uniform landscapes of smooth profile	Irregular, rugged and complex landscapes.		
Openness	High degree of openness and exposure	Landscape with a secluded, enclosed character		
Land cover	Landscapes characterised by simple or regular landcover.	Landscapes characterised by irregular or complex land cover.		
Pattern and colour	Simple lines, patterns and colour palette.	Complex and variegated pattern and colour.		
Built environment	Strongly influenced by modern buildings, infrastructure and utilities.	Limited influence modern buildings, infrastructure and utilities or presence of mainly traditional or historic forms.		
Views and intervisibility	Limited views to and from the landscape.	Extensive views to and from the landscape.		
Skylines, backdrops and focal points	Low lying landscapes with simple skyline and absence of backdrop.	Undulating, rugged, complex landscapes with distinctive features and focal points with a readily identifiable skyline.		