

Technical Appendix 7.1 LVIA Methodology

1. Introduction

- 1.1. This Technical Appendix (TA) has been prepared to accompany Chapter 7: Landscape and Visual Impact Assessment of Carn Fearna Wind Farm (the Proposed Development) Environmental Impact Assessment Report (EIA Report). This methodology has been prepared by landscape architects at SLR Consulting Limited and describes in detail the methodology that has been used to carry out the Landscape and Visual Impact Assessment (LVIA). The LVIA identifies and assesses the significance of changes resulting from the Proposed Development on both the landscape as an environmental resource and on views and visual amenity.

2. Key Guidance Documents

- 2.1. The LVIA methodology is devised specifically for the assessment of wind farm developments and accords with GLVIA3, the key source of guidance for LVIA (including the clarifications set out by the Landscape Institute in 2024¹). Sources of guidance used and referenced in this methodology include the following:
- Landscape Institute and IEMA (2013). Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3).
 - Landscape Institute (2024). Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3) Technical Guidance Note LITGN-2024-01.
 - NatureScot (2020/2023). Assessing Impacts on Wild Land Areas Technical Guidance Revised August 2023 to reflect NPF4.
 - NatureScot (2021). Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments.
 - NatureScot (2024). Guidance on Aviation Lighting Impact Assessment.
 - SNH (2017). Visual Representation of Wind Farms, Version 2.2.
 - The Highland Council (THC) (July 2016). Visualisation Standards for Wind Energy Developments.

3. Information and Data Sources

- 3.1. The assessment is initiated through a desk study of the Proposed Development and the LVIA study area. This desk study identifies aspects of the landscape and visual resource that are considered in the LVIA, including landscape character types, landscape related planning designations, wild land areas (WLAs), operational and potential cumulative wind farms, and views from routes and settlements. The desk study utilises Geographic Information System (GIS) and ReSoft WindFarm software to explore the potential visibility of the Proposed Development. The resultant Zone of Theoretical Visibility (ZTV) diagrams and wirelines provide an indication of which landscape and visual receptors are likely to be key in the assessment. Landscape characterisation information and data has been obtained from the NatureScot Landscape Character Assessment in Scotland online database².

4. Study Area

- 4.1. The initial step in the LVIA is the establishment of the Study Area. In accordance with NatureScot guidance (SNH 2017) a study area with a radius of 45 kilometres (km) from the nearest turbine in the Proposed Development has been utilised. Mapping of the various characteristics and features of the Study Area that are relevant to the assessment (i.e. landscape character types and landscape-planning designations) and Zone of Theoretical Visibility (ZTV) mapping is presented with both 45 km and 20 km study areas in order that the wider context can be seen at a broad scale while the local context can also be clearly seen.
- 4.2. The cumulative assessment is carried out to an initial 60 km radius with the detailed assessment focussing on a 45 km radius.
- 4.3. The hours of darkness assessment has a 20 km study area, which is the upper limit suggested by NatureScot in its guidance (NatureScot 2024).

¹ Landscape Institute, Technical Guidance Note LITGN – 2024-01, Published August 2024

² NatureScot (2023) Scottish Landscape Character Types Map and Descriptions. Available at <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions>. Accessed on: 10 September 2024.

5. Field Survey

- 5.1. Field surveys are carried out throughout the 45 km radius study area, although the focus is on the areas shown on the ZTV to gain theoretical visibility of the Proposed Development. The baseline field survey has five broad stages.
- A preliminary familiarisation of the study area in order to visit the aspects of the landscape and visual resource that have been identified through the desk study and verify their existence and importance. Important features and characteristics that have not become apparent through the desk study are also identified, and particularly sensitive receptors are noted in order to inform the design process.
 - A visit onto the site itself, in order to establish the potential of the site for wind farm development and identify the most suitable areas for Proposed Development in landscape and visual terms, along with any constraints that may restrict the developable area.
 - Further field survey around the study area, concurrent with the design process for the Proposed Development, to identify those receptors that are likely to be particularly important in the assessment and inform the layout design, possible turbine height, and the extent of the Proposed Development.
 - The identification of representative viewpoints to include in the landscape and visual assessment, including a wide range of receptors, landscape character, and directions and distances from the Proposed Development.
 - An on-site review of the special qualities/wildness qualities of landscape planning designations and WLAs, which informs the likely effect of the Proposed Development on these qualities and its effect on the overall integrity of the designations/WLAs.

6. Categories of Effects

- 6.1. In this methodology, potential effects on the landscape and visual resource are grouped into six categories.
- 6.2. **Effects on Physical Elements:** are restricted to the area within the site and are direct effects on the existing landscape fabric, such as alteration to ground cover. This category of effects is made up of landscape elements, which are the components of the landscape, such as moorland, that may be directly and physically affected by the Proposed Development.
- 6.3. **Effects on Landscape Character:** landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements that physically alter this pattern of elements, or through visibility of the Proposed Development, which may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups; landscape character types and landscape-related designated areas.
- 6.4. **Effects on Wild Land Areas:** the assessment of effects on WLAs is carried out in accordance with guidance (NatureScot 2020/2023).
- 6.5. **Effects on Views:** the assessment of effects on views is an assessment of how the introduction of the Proposed Development will affect views throughout the study area. The assessment of effects on views is carried out in two parts:
- the effects that the Proposed Development will have on a series of viewpoints; and
 - the effects that the Proposed Development will have on views from principal visual receptors, which include relevant settlements and routes throughout the study area.
- 6.6. **Cumulative Effects:** arise where the study areas for two or more wind farms overlap so that multiple wind farms are experienced at proximity where they may have a greater incremental effect, or where wind farms may combine to have a sequential effect.
- 6.7. **Hours of Darkness Effects:** the effect that visible aviation lighting on the Proposed Development turbines will have on the landscape and visual resource.

7. Significance of Effects

- 7.1. The objective in assessing the effects of the Proposed Development is to predict the significant effects on the landscape and visual resource. The EIA Regulations require that the direct and indirect significant effects of the Proposed Development are identified, described and assessed, and therefore the LVIA effects are assessed to be either significant or not significant. The LVIA does not define intermediate levels of significance as the EIA Regulations do not provide for these. GLVIA3 also provides guidance on this, noting that (paragraphs 3.32 and 3.33): *'LVIA should always distinguish clearly between what are considered to be the significant and non-significant effects...it is not essential to establish a series of thresholds for different levels of significance of landscape and visual effects, provided that it is made clear whether or not they are considered significant.'*

- 7.2. The significance of effects is assessed through a combination of the sensitivity of the landscape receptor, visual receptor or view and the magnitude of change that will result from the addition of the Proposed Development. While this methodology is not reliant on the use of a matrix to determine the conclusion of a significant or not significant effect, a matrix is included in Table 1 to illustrate how combinations of sensitivity and magnitude of change ratings can give rise to significant effects. On this basis potential impacts are assessed as negligible, minor, moderate-minor, moderate, major-moderate and major.
- 7.3. In this assessment, any effects with a significance level of major and major-moderate (shaded darker grey in the table) are deemed significant. Moderate levels of effect (shaded lighter grey in the table) have the potential, subject to the assessor's professional judgement, to be considered as significant or not significant, depending on the sensitivity and magnitude of change factors evaluated. GLVIA3 clarification note 3(5) supports this approach and states that '*moderate effects may or may not be significant and justification would be needed in the methodology or receptor assessment as to whether a moderate effect is significant or not.*' The assessments of significance for moderate levels of effect are therefore explained as part of the assessment, where they occur. Effects assessed as being moderate-minor, minor or negligible (no shading) are deemed as not significant.
- 7.4. A significant effect arises where the Proposed Development will provide one of the defining influences on a landscape element, landscape character receptor or view. A not significant effect occurs where the effect of the Proposed Development will not be material, and the baseline characteristics will continue to provide the definitive influences. Definitions are not provided for the individual categories of significance shown in the matrix and the reader should refer to the detailed definitions provided for the factors that combine to inform sensitivity and magnitude.
- 7.5. This assessment assumes clear weather and optimum viewing conditions. This means that effects that are assessed to be significant may be not significant under different, less clear conditions.

Table 1 – Significance of Effect

| | Magnitude | | | | | | |
|-------------|-------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------|------------------------------|
| | | High | High-medium | Medium | Medium-Low | Low | Negligible |
| Sensitivity | High | Major (Significant) | Major (Significant) | Major-Moderate (Significant) | Moderate (Significant/ Not Significant) | Moderate - Minor (Not significant) | Minor (Not significant) |
| | High-medium | Major (Significant) | Major-Moderate (Significant) | Moderate (Significant / Not Significant) | Moderate (Significant / Not Significant) | Moderate - Minor (Not significant) | Minor (Not significant) |
| | Medium | Major-Moderate (Significant) | Moderate (Significant / Not Significant) | Moderate (Significant / Not Significant) | Moderate - Minor (Not significant) | Minor (Not significant) | Minor (Not significant) |
| | Medium-Low | Moderate (Significant / Not Significant) | Moderate (Significant / Not Significant) | Moderate - Minor (Not significant) | Minor (Not significant) | Minor (Not significant) | Negligible (Not significant) |
| | Low | Moderate (Significant / Not Significant) | Moderate - Minor (Not significant) | Minor (Not significant) | Minor (Not significant) | Negligible (Not significant) | Negligible (Not significant) |
| | | | | | | | |

8. Assessment of Physical Landscape Effects

- 8.1. The physical effects of the Proposed Development are restricted to the area within the site boundary where existing landscape elements may be changed. Physical effects are the direct effects as a result of the Proposed Development on the fabric of the area within the site boundary, such as the removal of trees and alteration to ground cover. The objective of the assessment of physical effects is to determine what the likely physical effects of the Proposed Development will be, which landscape elements will be affected, and whether these effects will be significant or not significant. The variables considered in the assessment of the sensitivity of landscape elements and the magnitude of change that the Proposed Development will have on them are described below.

Sensitivity of Landscape Elements

- 8.2. The sensitivity of a landscape element is an expression of its ability to accommodate the Proposed Development. This is dependent on the value of the landscape element and its susceptibility to the change that will arise from the addition of the Proposed Development.
- The value of a landscape element is a reflection of its importance in the pattern of elements which constitute the landscape character of the area. For example, the value of woodland is likely to be increased if it provides an important component of the local landscape character. If a landscape element is particularly rare, as a remnant of an historic landscape layout for example, or a particular

combination of landscape elements in a locale presents particular qualities, its value is likely to be increased.

- The susceptibility of a landscape element to change is a reflection of the degree to which landscape elements are vulnerable to change and the extent to which they can be restored, replaced or substituted.

- 8.3. The evaluation of sensitivity is described for each receptor in the assessment and levels of sensitivity - high, high-medium, medium, medium-low and low - are applied.

Magnitude of Change on Landscape Elements

- 8.4. The magnitude of change on landscape elements is quantifiable and is expressed in terms of the degree to which a landscape element will be removed or altered by the Proposed Development, the extent of existing landscape elements that will be lost and the contribution of that element to the character of the landscape. Definitions of magnitude of change are applied in order that the process of assessment is made clear. These are:

- High: where the Proposed Development will result in the complete removal or substantial alteration of a key landscape element.
- Medium: where the Proposed Development will result in the removal of a notable part of a landscape element or a notable alteration to a key landscape element.
- Low: where the Proposed Development will result in the removal of a minor part of a landscape element or a minor alteration to a key landscape element.
- Negligible: where the Proposed Development will result in the removal of a negligible amount of a landscape element or is barely discernible.

- 8.5. There may also be intermediate levels of magnitude of change, such as high-medium or medium-low, where the change falls between definitions.

Significance of Effects on Landscape Elements

- 8.6. The assessment of effect on landscape elements is dependent on all of the factors considered in the sensitivity of the receptor and the magnitude of change upon it, and by applying professional judgement to assess whether or not the Proposed Development will have an effect that is significant or not significant.
- 8.7. A significant effect will occur where the degree of removal or alteration of the landscape element is such that the landscape element will be redefined. If the landscape element is of a high sensitivity, a significant effect can occur with a limited degree of removal or alteration. A not significant effect will occur where the form of the landscape element is not redefined, as a result of the particular characteristics of the Proposed Development. If the landscape element is of lower sensitivity, it could undergo a higher level of removal or alteration yet remain as a not significant effect.

9. Assessment of Effects on Landscape Character

- 9.1. Landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and the way that this pattern is perceived. Effects on landscape character arise through the introduction of new elements that physically alter this pattern of elements, the removal of characterising elements, or through visibility of the Proposed Development, which may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups; landscape character types and designated areas.
- 9.2. The objective of the assessment of effects on landscape character is to determine which landscape character receptors will be affected by the Proposed Development, and whether these effects will be significant or not significant. The assessment of effects on landscape character involves an evaluation of sensitivity and magnitude of change, and the resultant assessment of significance.

Sensitivity of Landscape Character Receptors

- 9.3. The sensitivity of a landscape character receptor is an expression of its ability to accommodate the Proposed Development as part of its own character or as part of the setting or context to the character receptor. This is dependent on the value of the landscape receptor and its susceptibility to change.

Value of Landscape Character Receptors

- 9.4. The value of a landscape character receptor is classified as high, high-medium, medium, medium-low or low and the basis for this assessment is made clear using evidence and professional judgement, based on the following range of factors:
- Landscape designations: a receptor that lies within a recognised landscape-related planning designation will generally have an increased value, depending on the proportion of the receptor that is covered and the level of importance of the designation (international, national, regional or local). It is important to note that the absence of designations does not preclude local resource value, as an undesignated landscape character receptor may be important as a resource in the local or

- immediate environment, particularly when experienced in comparison with other nearby landscapes;
- Landscape quality: the quality of a landscape character receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which these attributes have remained intact. A landscape with consistent, intact and well-defined, distinctive attributes is generally considered to be of higher quality and, in turn, higher value, than a landscape where the introduction of inappropriate elements has detracted from its inherent attributes; and
 - Landscape experience: the experience of the landscape character receptor can add to its value and relates to a number of factors including the perceptual responses it evokes, the cultural associations that may exist in literature or history, or the iconic status of the landscape in its own right, the recreational value of the landscape for outdoor pursuits, and the contribution of other values relating to the nature conservation or archaeology of the area.

Susceptibility to Change of Landscape Character Receptors





- 9.5. The susceptibility of a landscape character receptor to change is a reflection of its ability to accommodate the changes that will occur as a result of the type or nature of change proposed. The assessment of the susceptibility of the landscape receptor to change is classified as high, high-medium, medium, medium-low or low and the basis for this assessment is made clear using evidence and professional judgement, based on the following criteria.
- The specific nature of the Proposed Development: the susceptibility of landscape receptors is specific to the change arising from the particular development that is proposed, including its individual components and features, and its size, scale, location, context and characteristics;
 - Landscape character: the key characteristics of the existing landscape character of the receptor are considered in the evaluation of susceptibility as they determine the degree to which the receptor may accommodate the influence of the Proposed Development. For example, a landscape that is of a particularly wild and remote character may have a high susceptibility to the influence of the Proposed Development due to the contrast that it will have with the landscape, whereas a developed landscape where built elements and structures are already part of the landscape character may have a lower susceptibility. However, there are instances when the quality of a landscape may have been degraded to an extent whereby it is considered to be in a fragile state and therefore a degraded landscape may have a higher susceptibility to the Proposed Development; and
 - Landscape association: the extent to which the Proposed Development will influence the character of the landscape receptors across the Study Area also relates to the associations that exist between the landscape within which the Proposed Development is located and the landscape receptor from which the Proposed Development is being experienced. This association will be most important where the landscapes are directly related; for example, if the Proposed Development is located in an upland landscape that has a strong enclosing influence on an adjacent valley landscape. Elsewhere, the association may be less important; for example, where the Proposed Development lies inland of a coastal landscape that has its main focus outwards over the sea.

Sensitivity Rating

- 9.6. An overall sensitivity assessment of the landscape receptor is made by combining the assessment of the value of the landscape character receptor and its susceptibility to change, and an overall level of sensitivity is applied for each landscape receptor: high, high-medium, medium, medium-low and low. The basis for the assessments is made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor. Criteria that tend towards higher or lower sensitivity are set out in Table 2.

Table 2: Sensitivity to Change – Landscape Character Receptors

| Criteria tending towards higher or lower sensitivity | | | |
|------------------------------------------------------|------|--------|-----|
| Value | High | Medium | Low |

| Criteria tending towards higher or lower sensitivity | | |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Designated landscapes with national policy level protection or defined for their natural beauty.</p> <p>Higher quality landscapes with consistent, intact and well-defined, distinctive attributes.</p> <p>Rare or unique landscape character types or features.</p> <p>Aesthetic or perceptual aspects of designated wildlife, ecological, geological or cultural heritage features that contribute to landscape character and local/regional identity.</p> <p>Evidence that the landscape is valued or used substantially for recreational activity.</p> <p>Landscape with perceptual qualities of wildness, remoteness or tranquillity.</p> <p>Landscape with strong cultural associations that contribute to perceptions of scenic quality.</p> | <p>Landscapes without formal designation.</p> <p>Despoiled or degraded landscape with little or no evidence of being valued by the community.</p> <p>Lower quality landscapes with indistinct elements or features that detract from its inherent attributes.</p> <p>Widespread or 'common' landscape character types or features.</p> <p>Limited or no wildlife, ecological, geological or cultural heritage features, or limited contribution to landscape character and identity.</p> <p>No evidence that the landscape is used for recreational activity.</p> <p>Landscape with inherent character has been changed by human activity.</p> <p>Landscape with few cultural associations.</p> |
| | <p>High  Medium  Low</p> | |
| Susceptibility to Change | <p>Landscape key characteristics which are likely or liable to be influenced by the type or nature of change proposed.</p> <p>Landscape vulnerable or fragile to change through the loss or addition of features that will alter key landscape characteristics.</p> <p>Landscape which lacks the ability to resist/accommodate the change that is likely to occur as a result of the type or nature of change proposed.</p> <p>Landscape of high quality/in good condition.</p> <p>Aesthetic or perceptual aspects of landscape are susceptible to changes associated with the type or nature of change proposed.</p> <p>Strong or direct association between Proposed Development and the landscape receptor.</p> | <p>Landscape characteristics which are unlikely or not liable to be influenced by the type or nature of change proposed.</p> <p>Robust landscape, able to accommodate change or loss of features without altering key characteristics.</p> <p>Landscape which has the ability to resist/accommodate the change that is likely to occur as a result of the type or nature of change proposed.</p> <p>Landscape of low quality/in poor condition.</p> <p>Aesthetic or perceptual aspects of landscape may accommodate changes associated with features of type or nature of change proposed.</p> <p>Weak and indirect association between the landscape receptor and the Proposed Development.</p> |
| Sensitivity to Change | <p>High  Medium  Low</p> | |

Magnitude of Change on Landscape Character Receptors

- 9.7. The magnitude of change on landscape character receptors is an expression of the scale of the change that will result from the Proposed Development and is dependent on a number of variables regarding the size or scale of the change. An assessment is also made of the geographical extent of the area over which this will occur and the duration and reversibility of such changes. The basis for this assessment is made clear using evidence and professional judgement, based on the following criteria.

Size or Scale of Change

- 9.8. This criterion relates to the size or scale of change to the landscape that will arise as a result of the Proposed Development, based on the following factors.
- The degree to which the pattern of elements that makes up the landscape character will be altered by the Proposed Development, through removal or addition of elements in the landscape. The magnitude of change will generally be higher if key features that make up the landscape character are extensively removed or altered, and if many new components are added to the landscape.
 - The extent to which the Proposed Development will change, physically or perceptually, the characteristics and any qualities identified that may be important in the creation of the distinctive character of the landscape. This may include the scale of the landform, its relative simplicity or irregularity, the nature of the landscape context, the grain or orientation of the landscape, the

degree to which the receptor is influenced by external features and the juxtaposition of the Proposed Development with these key characteristics.

- The degree to which landscape character receptors will be changed by the addition of the Proposed Development, in place of or in addition to, baseline wind energy developments that are already present in the landscape. If the Proposed Development is located in a landscape receptor that is already affected by wind energy development, this may reduce the magnitude of change, particularly if there is a high level of integration and the developments form a unified and cohesive feature in the landscape. The converse could also be applicable.
- The scale of the landscape, landform and patterns of the landscape. A large-scale landscape can provide a more appropriate receiving environment than a more intimate, small-scale setting where development may result in uncomfortable scale comparisons and increase the magnitude of change.
- The distance between the landscape character receptor and the Proposed Development. Generally, the greater the distance, the lower the scale of change as the Proposed Development will constitute a less apparent influence on the landscape character.
- The extent of the Proposed Development that will be seen from the landscape receptor. Visibility of the Proposed Development may range from one turbine blade tip to all of the turbines, and generally the greater the extent of the Proposed Development that can be seen, the greater the change.
- In relation to designated landscapes, the size or scale of change is considered against the identified special landscape qualities that underpin the designation and the impact on the integrity of the designation. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape receptors and their overall integrity.

Geographical Extent

- 9.9. The geographical extent over which the landscape effects will be experienced is also assessed as a modifier of the magnitude of change, which is distinct from the size or scale of effect. The extent of the effects varies depending on the specific nature of the Proposed Development and is principally assessed through analysis of the extent of physical change to the landscape or the extent to which the experience of that landscape character will change through visibility of the Proposed Development. This evaluation expresses the extent of the receptor that will experience a particular magnitude of change and can affect the geographical extents of the significant and non-significant effects.

Duration and Reversibility

- 9.10. The duration and reversibility of landscape effects are based on the period over which the Proposed Development is likely to exist and the extent to which the Proposed Development will be removed, and its effects reversed at the end of that period. Where relevant, duration and reversibility are stated separately in relation to the assessed effects.

Levels of Magnitude of Change

- 9.11. An evaluation of the magnitude of change on landscape receptors is made by combining the considerations of size or scale of change, geographical extent and, where relevant, duration and reversibility. The magnitude of change is assessed as high, medium, low or negligible according to the following definitions.
- High, where the Proposed Development will result in a major alteration to the baseline character of the landscape, providing a prevailing influence and/or introducing elements that are substantially uncharacteristic in the receiving landscape.
 - Medium, where the Proposed Development will result in a moderate alteration to the baseline character of the landscape, providing a readily apparent influence and/or introducing elements that may be prominent but are not necessarily uncharacteristic in the receiving landscape.
 - Low, where the Proposed Development will result in a minor alteration to the baseline character of the landscape, providing a slightly apparent influence and/or introducing elements that are characteristic in the receiving landscape.
 - Negligible, where the alteration to landscape character is barely discernible.
- 9.12. There may also be intermediate levels of magnitude of change – high-medium, medium-low or low-negligible - where the change falls between two of the definitions.

Table 3: Magnitude of Change – Landscape Receptors

| Criteria tending towards higher or lower magnitude of change | | | |
|--------------------------------------------------------------|------|----------|-------|
| Size or scale of change | High | → Medium | → Low |

| Criteria tending towards higher or lower magnitude of change | | |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Major loss of existing landscape elements which contribute to the landscape character.</p> <p>Major alteration to pattern of elements, or perception of landscape pattern, through removal or addition of landscape elements.</p> <p>Major change to key characteristics which define the distinctive character of the landscape.</p> <p>Proposed Development located within or close to landscape receptor and results in large scale change to its landscape character.</p> <p>Large amount of Proposed Development visible resulting in higher scale of change.</p> <p>Proposed Development contrasts with other existing windfarms in pattern, scale and relationship to key characteristics, creating a confusing or inconsistent image or relationship to key characteristics.</p> | <p>Minor or negligible loss of existing landscape elements.</p> <p>Minor alteration to pattern of elements, or perception of landscape pattern.</p> <p>Minor change to key characteristics, or changes to characteristics which are not part of inherent distinctiveness.</p> <p>Proposed Development located at greater distance from landscape receptor and resulting in small scale change to its landscape character.</p> <p>Small amount of Proposed Development visible resulting in lower scale of change.</p> <p>Proposed Development consolidates existing windfarms, relates consistently to a key characteristic of the landscape and/or has a high level of integration forming a unified and cohesive feature in the landscape.</p> |
| Geographic extent | <p>High —————> Medium —————> Low</p> | |
| | <p>Wide extent of physical change to the landscape.</p> <p>Proposed Development is visible over long distances.</p> <p>Proposed Development is visible from widespread areas/extensive parts of landscape receptor.</p> <p>Visibility/views of Proposed Development occur over a wider area represented by multiple landscape receptors.</p> | <p>Limited extent of physical change to the landscape.</p> <p>Proposed Development has limited visibility.</p> <p>Proposed Development is visible from restricted areas/limited parts of landscape receptor.</p> <p>Visibility/view of Proposed Development is unique to a particular location of landscape.</p> |
| Size or scale of change | <p>High —————> Medium —————> Low</p> | |

Significance of Effects on Landscape Character Receptors

- 9.13. The significance of the effect on each landscape character receptor is dependent on the factors that are considered in the sensitivity of the receptor and the magnitude of change upon it. These factors are combined using professional judgement to arrive at an overall assessment as to whether the Proposed Development will have a significant or not significant effect on the receptor. The matrix shown in Table 1 is also used to inform the threshold of significance when combining sensitivity and magnitude of change.
- 9.14. A significant effect will occur where the combination of the variables results in the Proposed Development becoming one of the defining influences on the receptor. A not significant effect will occur where the effect of the Proposed Development is not definitive, and the landscape character of the receptor continues to be characterised principally by its baseline characteristics. In this instance, the Proposed Development may have an influence on the landscape character of the receptor, but this influence will not be a defining one.

10. Assessment of Effects on Wild Land

- 10.1. The assessment of effects on wild land areas (WLAs) is carried out in accordance with guidance (NatureScot 2020/2023), which provides a methodology. A WLA assessment is included in Chapter 7 of the EIA Report, and the methodology used is described within the assessment.

11. Assessment of Effects on Views

- 11.1. The assessment of effects on views is an assessment of how the introduction of the Proposed Development will affect views throughout the study area (including during hours of darkness). The assessment of effects on views falls into two parts:

- an assessment of the effects that the Proposed Development will have on a series of viewpoints that have been selected to represent the views available to people from representative or specific locations within the study area; and
- an assessment of the effects that the Proposed Development will have on views from principal visual receptors, including residents of settlements, motorists using roads and people using recreational routes, features and attractions throughout the study area.

11.2. The objective of the assessment of effects on visual receptors is to determine what the likely effects of the Proposed Development will be on views across the study area, and whether these effects will be significant or not significant. The assessment of effects on views involves an evaluation of sensitivity and magnitude of change, and the resultant assessment of significance.

Sensitivity of Visual Receptors

11.3. The sensitivity of visual receptors is determined by a combination of the value of the view and the susceptibility of the visual receptor to the change in views and visual amenity.

Value of the View

11.4. The value of a view is a reflection of the recognition and the importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s) the high strength of which is assessed and verified through field work. The value of a view is classified as high, high-medium, medium, medium-low or low and the basis for this assessment is made clear using evidence and professional judgement, based on the following criteria:

- Formal recognition: The value of views can be formally recognised through their identification on OS or tourist maps as formal viewpoints, sign-posted and with facilities provided to add to the enjoyment of the viewpoint such as parking, seating and interpretation boards. Specific views may be afforded protection in local planning policy and recognised as valued views. Specific views can also be cited as being of importance in relation to landscape or heritage planning designations, for example the value of a view will be increased if it presents an important vista from a designed landscape, lies within or overlooks a designated landscape area such as a National Scenic Area, or an area of scenic quality which implies a greater value to the visible landscape.
- Informal recognition: Views that are well-known at a local level can have an increased value, even if there is no formal recognition or designation. Views or viewpoints are sometimes informally recognised through references in art or literature, and this can also add to their value. A viewpoint that is visited or used by a large number of people will tend to have greater importance than one gained by very few people, although this is not always the case. Specific or sequential views that from a particular combination of key landscape characteristics, have a defined scenic quality or qualities can also add to the value assessed.

Susceptibility of Visual Receptors

11.5. Susceptibility relates to the nature of the viewer and how susceptible they are to the potential effects of the Proposed Development. This is determined by the occupation of the viewer and the extent to which their attention or interest is likely to be focussed on the view and the visual amenity that they experience at the viewpoint.

11.6. The most common groups of viewers considered in the visual assessment include residents, people taking part in outdoor recreation such as walkers or cyclists, road-users, and workers. Viewers whose attention is focussed on the landscape – walkers or cyclists on recognised walking or cycling routes, for example - are likely to have a high susceptibility, as will residents of properties that gain views of the Proposed Development. Viewers travelling in vehicles or on trains will tend to have a medium susceptibility as their view is transient and moving. However, people travelling on a national tourist route can have a heightened susceptibility as they are likely to have an awareness of the surrounding landscape. The least sensitive viewers, with a low susceptibility, are usually people at their place of work as they are often less sensitive to changes in the view, although this depends on the nature of their work.

Levels of Sensitivity

11.7. An overall level of sensitivity is applied for each visual receptor or view - high, high-medium, medium, medium-low, or low - by combining the assessments of value and susceptibility to change. The basis for the assessment is made clear using evidence and professional judgement in the evaluation of each receptor or view. Criteria that tend towards higher or lower sensitivity are set out in Table 4.

Table 4: Sensitivity to Change – Visual Receptors and Views

| Criteria tending towards higher or lower sensitivity | | | |
|------------------------------------------------------|------|----------|-------|
| Value | High | → Medium | → Low |

| Criteria tending towards higher or lower sensitivity | | |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Specific viewpoint identified in OS maps and/or tourist information and signage.</p> <p>Facilities provided to aid the enjoyment of the view.</p> <p>View afforded protection/recognition in planning policy/guidance.</p> <p>View is within or overlooks a designated landscape or has high scenic quality, which implies a higher value to the visible landscape.</p> <p>View has informal recognition and well-known at a local level.</p> <p>View or viewpoint is recognised through references in art or literature.</p> | <p>Viewpoint not identified in OS maps or tourist information and signage.</p> <p>No facilities provided to aid enjoyment of the view.</p> <p>View is not afforded protection in planning policy.</p> <p>View is not within, nor does it or overlook, a designated landscape or have high scenic quality.</p> <p>View has no informal recognition.</p> <p>View or viewpoint is not recognised through references in art or literature.</p> |
| Susceptibility to Change | High —————> Medium —————> Low | |
| | <p>People who are engaged in outdoor recreation whose attention and interest is likely to be focussed on the landscape or on particular views.</p> <p>Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience.</p> <p>Residents that gain static, long-term views of the surrounding landscape in their principal outlook or communities where views contribute to the landscape setting enjoyed by residents.</p> <p>People following recognised, signposted road-based tourist routes.</p> | <p>People at work whose attention is likely to be focussed on their work, or specific forms of recreation that are indoors or do not involve or depend upon appreciation of views of the landscape.</p> <p>Travellers on road or rail transport routes.</p> |
| Sensitivity to Change | High —————> Medium —————> Low | |

Magnitude of Change on Views

11.8. The magnitude of change on visual receptors and views is assessed in terms of the size or scale of the change, the geographical extent of the visual effect and, in some situations, its duration and reversibility. The key elements of the Proposed Development that will influence the level of change on views are the movement, form, material, colour and scale of the turbines, although infrastructure is also considered.

Size or Scale

11.9. This criterion relates to the size or scale of change to the view that will arise as a result of the Proposed Development, based on the following factors:

- The scale of the change in the view, with respect to the loss or addition of features in the view and changes in its composition.
- The distance between the visual receptor and the Proposed Development. Generally, the greater the distance, the lower the magnitude of change as the Proposed Development will constitute a smaller-scale component of the view.
- The proportion of the Proposed Development that will be seen. Visibility may range from one blade tip to all of the turbines. Generally, the more of the Proposed Development that can be seen, the higher the magnitude of change.
- The field of view available and the proportion of the view that is affected by the Proposed Development. Generally, the more of a view that is affected, the higher the magnitude of change will be. If the Proposed Development extends across the whole of the open part of the outlook, the magnitude of change will generally be higher. Conversely, if the Proposed Development covers just a part of an open, expansive and wide view, the magnitude of change is likely to be reduced as the Proposed Development will not affect the whole open part of the outlook.
- The scale and character of the context within which the Proposed Development will be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour and texture. The scale of the landform and the patterns of

the landscape, the existing land use and vegetation cover, and the degree and type of development and settlement seen in the view will be relevant.

- The consistency of the appearance of the Proposed Development. If the Proposed Development appears in a similar setting and form, and from a similar angle each time it is apparent, it will appear as a single, familiar site, and this can reduce the magnitude of change. If, on the other hand, it appears from a different angle and is seen in a different form and setting, the magnitude of change is likely to be higher.

Geographical Extent

11.10. The extent of effects on views is based on the following factors:

- The extent of a receptor (a road, footpath or settlement, for example) from which the Proposed Development may be seen. If the Proposed Development is visible from extensive areas, the overall magnitude of change is likely to be higher than if it is visible from a limited part of a receptor.
- The extent to which the change will affect views and whether this is unique to a particular viewpoint or if similar visual changes occur over a wider area represented by the viewpoint.
- The position of the Proposed Development in relation to the principal orientation of the view and activity of the receptor. If the Proposed Development is seen in a specific, directional vista, the magnitude of change will generally be greater than if it were seen in a glimpsed view at an oblique angle of view.

Duration and Reversibility

11.11. The duration and reversibility of effects on views are based on the period over which the Proposed Development is likely to exist and the extent to which it will be removed and its effects reversed at the end of that period. Duration and reversibility are not always incorporated into the overall magnitude of change and may be stated separately.

Levels of Magnitude of Change

11.12. The magnitude of change on views and visual receptors is evaluated by combining the considerations of size or scale of change, geographical extent and, where relevant, duration and reversibility. The magnitude of change is assessed as high, medium, low or negligible according to the following definitions:

- High, where the Proposed Development will result in a major alteration to the baseline view, providing a prevailing influence and/or introducing elements that are substantially uncharacteristic in the view.
- Medium, where the Proposed Development will result in a moderate alteration to the baseline view, providing a readily apparent influence and/or introducing elements that may be prominent but are not necessarily uncharacteristic in the view.
- Low, where the Proposed Development will result in a minor alteration to the baseline view, providing a slightly apparent influence and/or introducing elements that are characteristic in the view.
- Negligible, where the alteration to the view is barely discernible.

11.13. There may also be intermediate levels of magnitude of change - high-medium, medium-low, or low-negligible - where the change falls between two of the definitions.

11.14. Criteria that influence a higher or lower magnitude of change are set out in Table 5.

Table 5: Magnitude of Change – Views and Visual Receptors

| Criteria tending towards higher or lower magnitude of change | | |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | High —————> Medium | —————> Low |
| Size or scale of change | Large scale change in the view resulting from loss and/or addition of features and changes in its composition. | Small scale change in the view resulting from loss and/or addition of features and changes in its composition. |
| | Proposed Development located at close proximity to the viewpoint and will form large scale component of the view. | Proposed Development located at long distance from the viewpoint and will form small scale component of the view. |
| | All or majority of the Proposed Development will be visible in the view e.g. full towers and rotor sweep. | Limited amount of the Proposed Development will be visible in the view e.g. extremity of blade tips. Proposed Development affects small proportion of available field of view. |

| Criteria tending towards higher or lower magnitude of change | | |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Proposed Development affects large proportion of available/open field of view.</p> <p>Proposed Development has high degree of contrast/low degree of integration with existing landscape elements, in terms of scale, form, mass, line, height, colour and texture.</p> <p>Proposed Development appears inconsistently, in a different setting and/or form each time it is visible.</p> | <p>Proposed Development has low degree of contrast/high degree of integration with existing landscape elements, in terms of scale, form, mass, line, height, colour and texture.</p> <p>Proposed Development appears consistent, in a similar setting and/or form each time it is visible.</p> |
| Geographic extent | High —————> Medium —————> Low | |
| | <p>Proposed Development is visible over long distances.</p> <p>Proposed Development is visible from widespread areas/extensive parts of visual receptor.</p> <p>Visibility/views of Proposed Development occur over a wider area represented by multiple viewpoints.</p> | <p>Proposed Development is visible from restricted areas/limited parts of visual receptor.</p> <p>Visibility/view of Proposed Development is restricted to a particular location or viewpoint.</p> |
| Magnitude of change | High —————> Medium —————> Low | |

Significance of Effects on Views

- 11.15. The significance of the effect on each view or visual receptor is dependent on the factors that are considered in the sensitivity of the view or receptor and the magnitude of change upon it. These factors are combined using professional judgement to arrive at an overall assessment as to whether the Proposed Development will have a significant or not significant effect on the view or visual receptor. The matrix shown in Table 1 is also used to inform the threshold of significance when combining sensitivity and magnitude of change.
- 11.16. A significant effect will occur where the combination of the variables results in the Proposed Development becoming one of the defining influences on the view or visual receptor. A not significant effect will occur where the effect of the Proposed Development is not definitive, and the view continues to be characterised principally by its baseline characteristics. In this instance, the Proposed Development may have an influence on the view, but this influence will not be a defining one.

12. Assessment of Cumulative Effects

Introduction

- 12.1. The objective of the cumulative assessment is the identification of any significant cumulative effects that may arise from the addition of the Proposed Development to the cumulative situation, in accordance with NatureScot guidance (NatureScot 2021), which states that cumulative assessment should “*focus on the likely significant impacts and those which are likely to influence the outcome of the consenting process*”.
- 12.2. The objective of the assessment is to: “...describe, visually represent and assess the ways in which a proposed wind farm would have additional impacts when considered with other consented or proposed wind farms. It should identify the significant cumulative impacts arising from the proposed wind farm” (NatureScot, 2021).
- 12.3. The LVIA assesses the incremental effect arising from the addition of the Proposed Development to the cumulative situation, and not the overall accumulation of wind farms across the Study Area. This accords with GLVIA3, which notes (para 7.18):

“Some of those involved may tend to favour a limited view focussed on the additional effects of the project being assessed, on top of the cumulative baseline. Some stakeholders may however be more interested in the combined effects of all the past, present and future proposals, including the proposed scheme...assessing combined effects of different proposals at different stages in the planning process can be very complex. Furthermore the assessor will not have assessed the other schemes and cannot therefore make a fully informed judgement. A more comprehensive overview of the cumulative effects must rest with the competent authority.”

12.4. The cumulative assessment considers various scenarios of wind farm development.

- The current baseline wind energy development scenario includes wind farms that are operational or under construction (e.g. wind farms where there is certainty as to the presence and influence of these sites).
- The predicted baseline wind energy development scenario includes consented (not yet constructed) wind farms as well as operational and under construction wind farms (e.g. wind farms where there is some degree of certainty as to their presence and influence).
- Application stage wind farm scenarios are considered on a case-by-case basis as there is no certainty as to whether or not they will be present in the future.

Cumulative Magnitude of Change

12.5. The cumulative magnitude of change is an expression of the degree to which landscape character receptors and visual receptors/views will be changed by the addition of the Proposed Development to wind farm developments that are already operational, consented or at application stage. The cumulative magnitude of change is assessed based on a number of criteria, as described below.

- The location of the Proposed Development in relation to other wind farm developments. If the Proposed Development is seen in a part of the view or setting to a landscape receptor that is not affected by other wind farm development, this will generally increase the cumulative magnitude of change as it will extend wind farm influence into an area that is currently unaffected. Conversely, if the Proposed Development is seen in the context of other sites, the cumulative magnitude of change may be lower as wind farm influence is not being extended to otherwise undeveloped parts of the outlook or setting.
- The extent of the developed skyline. If the Proposed Development will add notably to the developed skyline in a view, the cumulative magnitude of change will tend to be higher as skyline development can have a particular influence on both views and landscape receptors.
- The number and scale of wind farm developments seen simultaneously or sequentially. Generally, the greater the number of clearly separate developments that are visible, the higher the cumulative magnitude of change will be. The addition of the Proposed Development to a view or landscape where a number of smaller developments are apparent will usually have a higher cumulative magnitude of change than one or two large developments as this can lead to the impression of a less co-ordinated or strategic approach.
- The scale comparison between wind farm developments. If the Proposed Development is of a similar scale to other visible wind farms, particularly those seen in closest proximity to it, the cumulative magnitude of change will generally be lower as it will have more integration with the other sites and will be less apparent as an addition to the cumulative situation.
- The consistency of image of the Proposed Development in relation to other wind farm developments. The cumulative magnitude of change of the Proposed Development is likely to be lower if its turbine height, arrangement and layout design are broadly similar to other wind farms in the landscape, as they are more likely to appear as relatively simple and logical components of the landscape.
- The context in which the wind farm developments are seen. If developments are seen in a similar landscape context, the cumulative magnitude of change is likely to be lower due to visual integration and cohesion between the sites. If developments are seen in a variety of different landscape settings, this can lead to a perception that wind farm development is unplanned and un-coordinated, affecting a wide range of landscape characters and blurring the distinction between them.
- The magnitude of change of the Proposed Development as assessed in the main assessment. The lower this is assessed to be, the lower the cumulative magnitude of change is likely to be. Where the Proposed Development itself is assessed to have a negligible magnitude of change on a view or receptor there will not be a cumulative effect as the contribution of the Proposed Development will equate to the 'no change' situation.

12.6. Definitions of cumulative magnitude of change are applied in order that the process of assessment is made clear.

- High, the addition of the Proposed Development to other wind energy developments in the landscape or view will result in a major change to the cumulative wind farm situation.
- Medium, the addition of the Proposed Development to other wind energy developments in the landscape or view will result in a moderate change to the cumulative wind farm situation.
- Low, the addition of the Proposed Development to other wind energy developments in the landscape or view will result in a minor change to the cumulative situation.
- Negligible, where the alteration to the cumulative situation is barely discernible, or there may be 'no change'.

12.7. There may also be intermediate levels of cumulative magnitude of change – high-medium, medium-low and low-negligible - where the change falls between two of the definitions.

Significance of Cumulative Effects

- 12.8. The objective of the cumulative assessment is to establish whether or not the addition of the Proposed Development to various scenarios of other relevant existing and proposed wind farms would lead to wind farm development becoming one of the prevailing characteristics of a view or landscape. Significant cumulative effects arise where a 'wind farm landscape' is apparent as a result of the addition of the Proposed Development to other existing or proposed wind farms, so that the addition of the Proposed Development will result in wind turbines becoming one of the prevailing or key characteristics.
- 12.9. In relation to the significance of cumulative landscape effects, GLVIA3 notes (paragraph 7.28) that "the most significant cumulative landscape effects are likely to be those that would give rise to changes in the landscape character of the study area of such an extent as to have major effects on its key characteristics and even, in some cases, to transform it into a different landscape type. This may be the case where the project being considered itself tips the balance through its additional effects."
- 12.10. GLVIA3 (paragraph 7.38) goes on to state the following in relation to the significance of cumulative visual effects:

"Higher levels of significance may arise from cumulative visual effects related to:

- developments that are in closer proximity to the main project and are clearly visible together in views from the elected viewpoints;*
- developments that are highly inter-visible, with overlapping ZTVs – even though the individual developments may be at some distance from the main project and from individual viewpoints, and when viewed individually not particularly significant, the overall combined cumulative effect on a viewer at a particular viewpoint may be more significant."*

- 12.11. It should be noted that if the Proposed Development itself is assessed to have a significant effect, it does not necessarily follow that the cumulative effect will also be significant.

13. Assessment of Hours of Darkness Effects

Introduction

- 13.1. The Civil Aviation Authority (CAA) requires that 'en-route obstacles' at or above 150 m above ground level are lit with visible lighting to assist their detection by aircraft. As the turbines in the Proposed Development are more than 150 m to tip height there is a requirement for the turbines to have visible lighting installed.
- 13.2. The assessment of visible aviation lighting has been undertaken in accordance with Guidance on Aviation Lighting Impact Assessment (NatureScot 2024).
- 13.3. The assessment of the lighting of the Proposed Development is primarily intended to determine the likely significant effects on the visual resource, as the details that constitute landscape character are less apparent during hours of darkness. However, as landscape features become less distinct in low light conditions, at twilight, during the night and at dawn, perceptions of darkness and remoteness may become apparent as constituent elements of landscapes. The assessment therefore also considers effects of aviation lighting on perceived character, focussing on how distinctive landforms and enclosing skylines, which remain perceptible at viewpoints at dusk and during hours of darkness, add to the perception of night-time character as seen at viewpoints. The assessment also considers the baseline level of light that is seen at viewpoints, and how this might contribute to an effect on perceived remoteness. Where dark skies or the night-time environment are specifically mentioned in relation to special landscape qualities of designated areas or wild land qualities of WLAs, these are also considered in the assessment.
- 13.4. Where existing lights are shown in the hours of darkness photographs, they appear larger and more blurred than those seen to the naked eye in the field when the photographs were captured. The term used in photography to describe this effect is 'Bokeh' which has been defined as '*the way the lens renders out-of-focus points of light*', and this phenomenon is difficult to avoid when taking photographs of light in a view. Where the aviation lights of the Proposed Development have been added to the night-time views, this bokeh effect has been emulated, based on experience of viewing aviation lighting in the field.
- 13.5. The movement of turbine blades passing in front of the aviation lights on each rotation causes a flickering effect when the lights are activated. The turbines shown in the night-time visualisations have been positioned so that their blades face away from the viewpoint and all of the lights are therefore visible, representing a worst-case impression.

Sensitivity during Hours of Darkness

- 13.6. The sensitivity of receptors during hours of darkness is evaluated in the same way as in the daytime, through a combination of value and susceptibility, each of which is categorised as high, high-medium, medium, medium-low, or low. However, the factors that are considered in sensitivity in daytime are not all applicable at night-time, and the sensitivity of a landscape or visual receptor may be different during hours of darkness, dependent on both value and sensitivity.

Value

- 13.7. Value is generally judged to be the same during hours of darkness as in the day-time assessment unless specific factors suggest otherwise; for example, a landscape that is identified as a Dark Sky Park is likely to have heightened value during hours of darkness. Conversely, value might be reduced if factors that contribute to value during daytime are irrelevant or imperceptible at night.

Susceptibility

- 13.8. Susceptibility is more likely than value to alter during hours of darkness.
- 13.9. Designated landscapes that are valued for their dark environment, as specified in their special landscape qualities, will generally have a heightened susceptibility as they are unlikely to be characterised by baseline lighting. The susceptibility of visual receptors also differs at night, reflecting the different activities people undertake during hours of darkness. For example, drivers using roads at night tend to be more focussed on the road and the area illuminated by headlights than during the day, and will have a number of internal and external baseline light sources, including dashboard lights, interior vehicle lights, oncoming headlights, street lights and reflective signage drawing their attention, resulting in lower susceptibility. On the other hand, people taking part in activities where darkness is essential, such as stargazing, are generally of higher susceptibility. The susceptibility of people experiencing hours of darkness views will also depend on the degree to which their perception is affected by existing baseline lighting. In brightly lit areas, or when travelling on roads from where sequential experience of lighting may be experienced, the susceptibility of receptors is likely to be lower than from within areas where the baseline contains no, or limited, existing lighting.
- 13.10. Examples of the relative susceptibility of different receptors at night are provided in guidance (NatureScot 2024) (Table 1).

Magnitude of Change during Hours of Darkness

- 13.11. The definitions used to describe the magnitude of change that may arise at night as a consequence of the appearance of visible lights are set out below.
- High, where the addition of aviation lighting results in large scale of change/large intrusion to the existing night-time baseline conditions/darkness in the view, due to a full and/or close-range view of visible aviation lighting and/or a high degree of contrast/low degree of integration with level of baseline lighting in the view. Results in obtrusive light which compromises or diminishes the view of the night sky.
 - Medium, where the addition of aviation lighting results in moderate scale of change/moderate intrusion to the existing night-time baseline conditions/darkness in the view, due to partial and/or middle-distance view of visible aviation lighting and/or moderate level of contrast/integration with level of baseline lighting in the view. Results in light that may partially compromise or diminish the view of the night sky, but which is not considered obtrusive.
 - Low, where the addition of aviation lighting results in small scale of change/minor intrusion to the existing night-time baseline conditions/darkness in the view, due to limited and/or distant view of aviation lighting and/or low degree of contrast/high degree of integration with level of baseline lighting in the view. Results in light that does not compromise or diminish the view of the night sky, nor is it considered obtrusive.
 - Negligible, where the addition of aviation lighting results in a largely indiscernible change/negligible intrusion to the existing night-time baseline conditions/darkness in the view, due to glimpsed view of lighting and/or slight degree of contrast/very high degree of integration with level of baseline lighting in the view. Results in light that does not compromise or diminish the view of the night sky, nor is it considered obtrusive.

- 13.12. Intermediate levels may be identified where, on the application of professional judgement, a level of change lies between two definitions.

Significance of Effects during Hours of Darkness

- 13.13. The significance of effects of aviation lighting is assessed through a combination of the sensitivity of the receptor and the magnitude of change that will result from the visible aviation lighting, taking into account the considerations described above, and informed by the matrix in Table 1.
- 13.14. A significant effect arises where the aviation lighting will provide one of the defining influences on a view/visual receptor or a landscape receptor/special landscape quality during hours of darkness. A not significant effect will arise where the effect of the lighting is not material, and the baseline conditions continue to provide the definitive influence. In this instance, the aviation lighting may have an influence, but this influence will not be definitive.

14. Nature of Effects

- 14.1. The 'nature of effects' relates to whether the effects of the Proposed Development are beneficial or adverse. Effects may also be neutral. Guidance provided in GLVIA3 (paragraph 3.22) states that "*thought must be given to whether the likely significant landscape and visual effects...are judged to be positive*

(beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity”.

The nature of effect is a matter that requires interpretation and reasoned professional opinion.

- 14.2. In relation to many forms of development, the EIA Report identifies positive and negative effects under the term ‘nature of effect’. The landscape and visual effects of wind farms are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which these effects can be measured as being categorically positive or negative. For example, in disciplines such as noise or ecology it is possible to identify the nature of the effect of a wind farm by objectively quantifying its effect and assessing the nature of that effect in prescriptive terms. However, this is not the case with landscape and visual effects, where the approach combines quantitative and qualitative assessment.
- 14.3. This assessment adopts a precautionary approach, which assumes that significant landscape and visual effects will be weighed on the negative side of the planning balance, although positive or neutral effects may arise in certain situations. Unless stated otherwise, the effects of the Proposed Development on landscape and visual amenity are considered to be negative.

15. Duration and Reversibility

- 15.1. The duration and reversibility of effects are based on the period over which the Proposed Development is likely to exist and the extent to which it could be removed and its effects reversed at the end of that period. The effects of the Proposed Development are of variable duration, and are assessed as short-term or long-term, and permanent or temporary/reversible. It is anticipated that the operational life of the Proposed Development will be 50 years. The wind turbines, substation and access tracks will be apparent during this time, and these effects are considered to be long-term.
- 15.2. Other infrastructure and operations such as the construction processes and plant (including tall cranes for turbine erection) and construction compounds will be apparent only during the initial construction period of the Proposed Development and are considered to be short-term effects. Borrow pit excavation will also be short-term as borrow pits will be restored at the end of the construction process.
- 15.3. The reversibility of effects is variable. The most apparent effects on the landscape and visual resource, which arise from the presence of the wind turbines, are temporary/reversible as the turbines will be removed on decommissioning. The effects of the tall cranes and heavy machinery used during the construction and decommissioning periods will also be temporary.
- 15.4. Access tracks would be left in-situ, which would reduce potential environmental impacts associated with potential sediment migration into watercourses as a result of removing all tracks. Turbine foundations (except for the top 1 m which will be removed) and underground cabling will be left in-situ below ground with no residual landscape and visual effects.
- 15.5. In order to avoid repetition, the duration and reversibility of effects are not reiterated throughout the assessment.

16. Graphic Representations

Zone of Theoretical Visibility (ZTV) Diagrams

- 16.1. ZTVs have been generated using Geographic Information System (GIS) software to demonstrate the number of turbines that may theoretically be seen from any point in the study area. The blade tip ZTVs show the number of turbines (blade tips) that are theoretically visible while the hub height ZTVs show the number of turbine hubs that are theoretically visible. When used in conjunction with each other, the two types of ZTV provide an indication of the degree to which the wind turbines are theoretically visible.
- 16.2. There are limitations in this theoretical production, and these should be considered in the interpretation and use of the ZTVs.
 - ZTVs illustrate the 'bare ground' situation, and do not take into account the screening effects of vegetation, buildings, or other local features that may prevent or reduce visibility.
 - ZTVs are based on theoretical visibility from 2 m above ground level.
 - ZTVs do not indicate the decrease in visibility that occurs with increased distance from the Proposed Development. The nature of what is visible from 3 km away will differ markedly from what is visible from 10 km away, although both are indicated on the ZTV as having the same level of visibility.
 - There is a wide range of variation within the visibility shown on ZTVs: for example, an area shown on the Blade Tip ZTV as having visibility of large numbers of turbines may gain views of the smallest extremity of blade tips, or of many full turbines. This can make a considerable difference in the effects of the Proposed Development on that area, and the hub height ZTV should be used in conjunction with the blade tip ZTV to provide an indication of the degree to which the wind turbines are visible.
- 16.3. These limitations mean that while ZTVs are used as a starting point in the assessment, providing an indication of where the Proposed Development will theoretically be visible, the information drawn from the ZTV is checked in the field, to ensure that the assessment conclusions represent the visibility of the Proposed Development reasonably accurately.

Visualisation Methodology

- 16.4. The viewpoint assessment comprises a series of viewpoints that are illustrated by a range of tools including wirelines, photographs and photomontages. The photographs used to produce the photomontages have been taken in RAW format using a digital SLR camera with fixed 50 mm lens and are taken on a tripod with a pano-head at a height of approximately 1.5 m above ground. This camera has a full-frame (35 mm negative size) CMOS sensor.
- 16.5. Wireline representations that illustrate the Proposed Development model, set within a computer-generated image of the landform, are used in the assessment to predict the theoretical appearance of the turbines. In the wirelines, the turbines are shown with the central turbines facing the viewer directly, with the full rotor diameter visible at its tallest extent. In the photomontages, the turbine rotors are shown with a random appearance with the blades facing the viewer.
- 16.6. Photomontages have been produced using Resoft Windfarm software to provide a more realistic image of how the Proposed Development might look. In all views the photomontages include the turbines. Where infrastructure is illustrated in the photomontages, it is based on the proposed alignment indicated in the site layout and has been overlaid onto the surface of the terrain model to provide an indication of the likely visual effects, but does not attempt to show the actual vertical alignment, including cut and fill that may be required. This cut and fill may increase or reduce the actual visibility of the infrastructure.
- 16.7. 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 will be apparent to the human eye. There are limitations in these theoretical productions, and these should be borne in mind in the consideration and use of wireline images. Firstly, the wirelines illustrate the 'bare ground' situation, not taking into account the screening effects of vegetation, buildings, or other local features that may prevent or reduce visibility. Secondly, there may be local, small-scale landform that is not reflected in the wirelines but may alter the real visibility of the Proposed Development, either by screening theoretical visibility or revealing parts of the Proposed Development that are not theoretically visible. Where descriptions within the assessment identify the numbers of turbines visible this refers to the theoretical illustrations generated and therefore the reality may differ to a degree from these impressions.

Details of Data and Software Packages

- OS 1:50,000 Scale Colour Raster.
 - Terrain data: Ordnance Survey Terrain 5, and Ordnance Survey Terrain 50.
 - Adobe Indesign 2025.
 - Adobe Photoshop 2025.
 - AutoCAD Map 3D 2024.
 - Autodesk 3ds Max 2024.
 - ESRI ArcGIS Pro 3.1.3.
 - Global Mapper 24.1.
 - PTGUI v12.21 Pro.
 - Resoft Windfarm v.5.0.2.1.
 - Visual Nature Studio 3.10.
- 16.8. Two separate sets of visualisations have been produced for the Proposed Development; one in accordance with NatureScot guidance (Visual Representation of Wind Farms, Version 2.2 (SNH, 2017)) and one in accordance with THC guidance (Visualisation Standards for Wind Energy Developments (July 2016)).

NatureScot Guidance

- 16.9. Baseline photographs and wireline (90° horizontal field of view): the photographs used for these are taken with a 50 mm lens and are stitched together to form 90° cylindrically projected images. When printed at an image size of 820 mm x 130 mm, these have a 90° horizontal field of view x 14.2° vertical field of view. The photographs and wirelines are generally centred on the visible turbines of the Proposed Development. The images have a principal viewing distance of 522 mm and are provided to illustrate the wider landscape and visual context only.
- 16.10. 53.5° wirelines and photomontages: these are produced for every viewpoint using Resoft Windfarm software to provide a more realistic image of how the Proposed Development might look. When printed at an image size of 820 mm x 260 mm they have a 53.5° horizontal field of view and have a principal viewing distance of 812.5 mm. All 53.5° wirelines and photomontages are planar projected.

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- 16.11. Images for landscape assessment: the photographs used for these are taken with a 50 mm lens and when printed at an image size of 390 mm x 140 mm have a focal length of 50 mm, vertical field of view of 46.4° and horizontal field of view of 65.5°. The photographs and wirelines are generally centred on the visible turbines of the Proposed Development.
- 16.12. Images for visual impact assessment: the photographs used for these are taken at the standard focal length of 50 mm with a 39.6° horizontal field of view and 27° vertical field of view. The photographs are

generally centred on the visible turbines of the Proposed Development. However, if the Proposed Development cannot be contained within the full extent of the horizontal field of view of the frame, the nearest visible turbine is included in the view.

- 16.13. The 39.6° horizontal field of view single frame photomontages, are reproduced at a size of 390 mm x 260 mm. As noted on the figures, “when viewed at a comfortable arm’s length, these images are representative of the maximum field of view of clear vision but are not representative of scale and distance”.
- 16.14. A set of single frame photomontages with a 75 mm focal length is also included. These images are extracted from the 50 mm focal length photomontage and conform to a 27° horizontal field of view x 18° vertical field of view. When reproduced at a size of 390 mm x 260 mm this image should be viewed at a comfortable arm’s length (approximately 500 mm) in order to gain as accurate an impression as possible of the real effect on the views.

Limitations and Assumptions of Graphics and Visualisations

- 16.15. NatureScot guidance (SNH 2017) provides the following information on the limitations of visualisations:

- *“Visualisations of wind farms have a number of limitations which you should be aware of when using them to form a judgement on a wind farm proposal. These include:*
- *A visualisation can never show exactly what the wind farm will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image.*
- *The images provided give a reasonable impression of the scale of the turbines and the distance to the turbines, but can never be 100 % accurate.*
- *A static image cannot convey turbine movement, or flicker or reflection from the sun on the turbine blades as they move.*
- *The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations.*
- *To form the best impression of the impacts of the wind farm proposal these images are best viewed at the viewpoint location shown.*
- *The images must be printed at the right size to be viewed properly (260mm by 820mm).*
- *You should hold the images flat at a comfortable arm’s length. If viewing these images on a wall or board at an exhibition, you should stand at arm’s length from the image presented to gain the best impression.*
- *It is preferable to view printed images rather than view images on screen. If you do view images on screen you should do so using a normal PC screen with the image enlarged to the full screen height to give a realistic impression. Do not use a tablet or other device with a smaller screen to view the visualisations described in this guidance.”*