The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Volume 3: Appendix 7.1 Visual Assessment Methodology

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nationalgrid

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1. Introduction

1.1 Overview

1.1.1 The North Humber to High Marnham Project (the 'Project') is a proposal by National Grid Electricity Transmission (NGET) (referred to as National Grid in this document) to reinforce the transmission network between a new Birkhill Wood Substation, close to the existing Creyke Beck Substation in Yorkshire, and a new substation adjacent to the existing High Marham Substation in Nottinghamshire. This would be achieved by reinforcing the transmission network with a new 400 kilovolt (kV) electricity transmission line over approximately 90 kilometres (km).

1.1.2 This report has been produced as an appendix to **Chapter 7 Landscape** in Volume 1 of the Preliminary Environmental Information Report (PEIR).

1.1.3 The environmental effects of the two substations including their associated overhead line reconfigurations, hereafter referred to as the Proposed Substation Works, have accordingly been considered within **Chapter 20 Substations and Associated Works**. For the purpose of this appendix the Proposed Overhead Line between the proposed Birkhill Wood Substation and the Proposed High Marnham Substation is hereafter referred to as the Proposed Overhead Line.

1.1.4 This Appendix describes the methodology used in the production of the preliminary visual assessment and that proposed to produce the visual chapter of the Environmental Statement (ES). It describes the methods used to determine the baseline conditions, sensitivity of the receptors, the magnitude of change and the approach to judging the significance of likely visual effects.

1.1.5 The methodology is an updated version of that submitted as part of the Environmental Impact Assessment (EIA) Scoping Report (Ref 1.1) and takes into account comments received as part of the Scoping Opinion (Ref 1.2).

1.1.6 The visual assessment considers the changes to specific views and general visual amenity experienced by people (visual receptors).

1.1.7 Landscape and visual assessments are inter-related. Visual effects can be considered independently of the effect on the landscape in which it is seen, but landscape effects require consideration of the visual effects of the Project.

1.2 Guidance Specific to Visual Assessment

1.2.1 In accordance with the approach to the EIA outlined in **Chapter 5 Approach to Preparing the PEIR** in Volume 2, the visual assessment, cumulative visual assessment, and presentation of visual effects adhere to relevant legislation and standards. Additionally, the assessment follows the applicable guidelines, as they apply to the Project, including:

- Landscape Institute and Institute for Environmental Management and Assessment (IEMA) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3), 2013 (Ref 1.3);

- Landscape Institute Technical Guidance Note (TGN) 01/24 Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3), 2024 (Ref 1.4);
- Landscape Institute Technical Guidance Note (TGN) 02/19 Residential Visual Amenity Assessment (RVAA) (Ref 1.7);
- Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment, 2024 (Ref 1.6); and
- Landscape Institute Technical Guidance Note 06/19 Visual Representation of Development Proposals, 2019 (Ref 1.7).

1.3 Definition of Visual Effects

1.3.1 Visual effects, as defined in paragraph 2.21 of GLVIA3 (Ref 1.3), means impacts or changes to *'specific views and the general visual amenity experienced by people'*.

1.3.2 In accordance with GLVIA3 (Ref 1.3), the assessment focuses on public views experienced by those groups of people who are likely to be most sensitive to change and therefore most likely to experience significant effects from the Project. These include:

- People living and moving around defined settlements, smaller scattered communities, and more isolated individual residences (where views contribute to the landscape setting enjoyed by residents in the area).
- People using recreational routes including nationally designated trails, promoted regional trails and National Cycle Network (NCN) routes where the wider landscape and views may be appreciated whilst undertaking the activity.
- People visiting recreational features and attractions (some of which may have historic or cultural heritage importance) where an appreciation of the wider landscape and views is an integral part of the activity. This includes people visiting designated landscapes.

1.3.3 The Inspectors agreed in their comments (ID 3.28 and 3.29) on the Scoping Opinion (Ref 1.2) that effects on people using the road or rail network or those working within the study area, could be scoped out of further assessment as an appreciation of the wider landscape and views is generally not integral to their activities. These receptors are typically considered to have lower susceptibility to changes in the view and will often share views of the Project with receptors who have a greater susceptibility.

Residential Visual Amenity

1.3.4 The routeing process seeks to avoid potential effects on the views and visual amenity of residential receptors wherever possible. The effects on private visual amenity at individual properties will continue to be considered during the ongoing design process, and where occupants of residential properties are predicted to experience adverse effects of major significance, these properties will be included in a Residential Visual Amenity Assessment (RVAA) assessment following recognised guidance in TGN 02/19 (Ref 1.7) as explained in section 3.

While effects of major significance are unlikely to arise during the construction phase, the need to assess construction effects on the visual amenity of occupants of individual

properties will remain under review once we have established more information/details concerning Project construction.

2. Approach to Visual Assessment

2.1 Assessing Visual Effects

2.1.1 The methodology used for conducting the visual assessment builds upon the general assessment methodology outlined in **Chapter 5 Approach to Preparing the PEIR** in Volume 2 and detailed in this appendix. This ensures that the visual assessment follows a consistent and structured approach in line with the overall EIA methodology.

2.1.2 The methodology is based on principles set out in GLVIA3 (Ref 1.3) and associated Notes and Clarifications (Ref 1.4).

2.1.3 GLVIA3 (Ref 1.3) is the established good practice guidance for visual assessment and complies with the requirements of National Policy Statements EN-1 (Ref 1.8) and EN-5 (Ref 1.9).

2.1.4 GLVIA3 (Ref 1.3) emphasises that the assessment should reflect the scale and complexity of the development, focusing on the likely significant effects rather than every possible effect. This approach allows for scoping out receptors where significant effects are unlikely, resulting in a more concise and meaningful assessment. The GLVIA3 (Ref 1.3) approach to assessing visual effects is summarised as follows:

- **Identify a study area**: This is the geographical area where potential visual effects from the Project could be experienced. The extent of the study area is determined through the preparation of Zone of Theoretical Visibility (ZTV) maps, which indicate the visual receptors likely to be affected by the presence of the Project. The ZTV helps define the spatial scope for assessing visual impacts.
- **Establish baseline conditions**: This involves desk studies and field surveys to evaluate the current visual conditions across the study area. The baseline includes the identification of visual receptors who are of higher susceptibility to the Project, an appraisal of existing views and visual amenity, and a professional judgement on the relative value of the views and general visual amenity currently experienced. Recognising that landscapes are dynamic, potential future changes independent of the Project are also considered, although these do not form the basis of the assessment.
- **Determine visual receptor sensitivity**: This involves making separate professional judgements on the relative value of the view and the susceptibility of the visual receptors to changes introduced by the Project.
- **Assess effects on visual receptors**: Effects are evaluated based on their size/scale, geographical extent, and their duration and reversibility. This analysis helps determine the magnitude of change likely to occur.
- **Apply professional judgement**: An overall judgment on the significance of effects is made by weighing the value of the view and susceptibility of the visual receptors with the magnitude of the anticipated change introduced by the Project.

2.1.5 This structured process allows for a comprehensive evaluation of how views would be affected by the Project and whether the changes are likely to be significant.

2.1.6 Each visual effect is categorised as major, moderate, minor, or negligible, as defined in Table 2.5.

2.2 Assessing Cumulative Effects

2.2.1 In line with good practice, an appraisal of cumulative visual effects related to the Project will be conducted and presented in the visual chapter of the ES. This assessment will follow the Government's latest guidance (Ref 1.6). As explained below, both intra-project effects (impacts within the Project) and inter-project effects (impacts in combination with those of other nearby developments) will be identified and assessed.

2.2.2 Cumulative effects are the result of multiple actions on environmental receptors or resources. There are two major sources of cumulative effects: 'intra-project' and 'inter-project' effects.

- Intra-project effects (also referred to as combined or 'interactive effects' between topics) occur where a single receptor is affected by more than one source of effect or aspect of the Project. An example of an intra-project effect would be where a local community is affected by dust, noise, and traffic disruption during the construction of the Project, with the result being a greater level of nuisance than each individual effect alone.
- Inter-project cumulative effects occur where a receptor is affected by two or more projects at the same time, potentially amplifying the overall effect. Individually the effects may not be significant, but when considered together could create a significant cumulative effect.

2.2.3 The assessment of intra-project and inter-project cumulative effects will follow the Government's latest guidance (Ref 1.6), which is outlined in **Chapter 21 Cumulative Effects** in Volume 2. The results of the assessment will be presented as a separate chapter in the ES as described in **Chapter 21 Cumulative Effects** in Volume 2 of the PEIR.

2.2.4 Existing developments, such as wind turbines and other vertical infrastructure (e.g., overhead lines and telecommunications masts), form part of the baseline environment. The assessment will consider the contribution of the Project to the total cumulative visual effects created by the construction and operation of all the developments included in the cumulative assessment.

2.3 Study Area

2.3.1 The study area for the for the preliminary assessment (based upon the same approach that will be adopted when defining the study area for the detailed visual assessment) is determined by the potential visibility of the Proposed Overhead Line in the surrounding landscape and is proportionate to the size and scale of the Project and nature of the surrounding landscape. Paragraph 5.2 of GLVIA3 (Ref 1.3) states that the study area should include *'the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner'.* The study area for the assessment extends 5 km from the Limits of Deviation (LoD)[1].

[1] At scoping a 5 km offset from the Project was assumed as a worst-case scenario but as the Project continued to be reviewed during the preliminary assessment (and following receipt of early design information, it became

2.3.2 To inform the assessment, a preliminary ZTV map has been produced based on the pylon heights for the Proposed Overhead Line, as set out in **Appendix 4.2 Indicative Pylon Schedule** and following the approach set out in this appendix. The ZTV map is shown on **Figure 7.2 Zone of Theoretical Visibility** and indicates the geographical area over which the Project could potentially give rise to visual effects up to a maximum distance of 10 km from the LoD.

2.3.3 Although significant effects at this distance are unlikely, the 10 km radius for the ZTV is used to:

- Assess cumulative visual effects with other developments.
- Ensure that the effects of taller elements such as the pylons at the River Ouse crossing are fully evaluated.
- Identify effects on distant receptors who are very susceptible to change arising from the Project.

2.3.4 To ensure that all likely significant visual effects are captured in the assessment, the study area will continue to be reviewed in the light of feedback received during statutory consultation, ongoing site surveys and following the production of an updated ZTV as the Project develops.

Approach to Defining the Study Area

2.3.5 The study area is informed by guidance on the perceived height of pylons when seen at varying distances (Ref 1.10). This study used a mathematical model to calculate the apparent height of a pylon when its true height and distance from a viewer are known.

2.3.6 The apparent height of a pylon is defined as the height that the structure would appear at arm's length (61 cm) from the viewer (i.e., the structure would appear to be the same height as an 'X' cm high object held at arm's length (61 cm) from the viewer). Using this calculation the apparent height of a 50 m tall pylon was calculated for varying distances from a viewpoint. The results are shown in Table 2.1. A 50 m high pylon was used in the calculation as this is the approximate height of the pylons proposed for the Project.

Table 2.1 - Apparent height of 50 m structure when viewed at arm's length

Distance	Apparent Height
100 m	30.50 cm
200 m	15.25 cm
300 m	10.16 cm
400 m	7.63 cm
500 m	6.10 cm
1000 m (1 km)	3.05 cm

apparent that likely significant effects would derive from activities and infrastructure within the LoD. Therefore, for proportionality reasons, a more focussed study area was adopted based on an offset from the LoD.

Distance	Apparent Height
2000 m (2 km)	1.53 cm
5000 m (5 km)	0.61 cm
10000 m (10 km)	0.31 cm

2.3.7 When testing the apparent heights in the field, it was observed that when a 50 m high pylon broadly appeared the same height (or more) as a 7.5 cm object held at arm's length (61 cm) from the viewer then there was potential that the structure may give rise to a large visual effect due to its prominence in the view. This is typically when a pylon is around 400 m from the viewer and is seen in open views without any screening from landform or vegetation. Beyond this distance the perceptibility of pylons approximately 50 m tall diminishes considerably in most instances, and in all but the clearest of viewing conditions. At 10 km the apparent height of a pylon is 0.31 cm.

2.4 Baseline Data Gathering

2.4.1 The visual baseline establishes the general area from which the Project may be visible. In accordance with page 32, paragraph 3.15 of GLVIA3 (Ref 1.3) this includes:

'*the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and the visual amenity at those points'*.

2.4.2 Changes in views may be experienced by people at different locations within the study area including from static locations and when moving through the landscape (normally referred to as sequential views, e.g., from footpaths, cycle routes or canals).

2.4.3 The baseline describes the current visual conditions across the study area and includes an assessment of any changes that would occur without the Project i.e., the future baseline.

2.4.4 The baseline is established using published landscape character assessments, which are then verified through field surveys to ensure accuracy and sufficient detail for the visual assessment.

Viewpoint Selection

2.4.5 Visual effects are reported by reference to the jurisdiction boundaries of parishes across the study area. The views experienced by visual receptors within the parishes are illustrated by representative viewpoints to be agreed with local planning authorities and other relevant stakeholders.

2.4.6 Viewpoint locations have been carefully selected to provide suitable representation of the likely visibility of the Project. These representative viewpoints are all in publicly accessible locations. The final viewpoint locations will be confirmed by way of field survey once the indicative route alignment has been confirmed and pylons have been microsited, to take account of the presence of localised screening. Each viewpoint has been visited and 360-degree photography from each of the viewpoints undertaken in accordance with TGN 06/19 (Ref 1.5) to illustrate the existing characteristics of the view. These characteristics will be detailed in the baseline description, prior to

undertaking the assessment of visual effects. More information on photography is available in section 4.1.

2.4.7 Viewpoint selection is based on desk-top analysis, consultation feedback and site survey. GLVIA3 Page 109, para 6.19 (Ref 1.3) notes that viewpoints can be representative, specific or illustrative, as it states:

- *'representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of users of selected public footpaths and bridleways;*
- *specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and*
- *illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations*.'

2.4.8 It should be emphasised that it is the people who would be experiencing the view from the viewpoint that are the receptor, not the viewpoint itself. The location affords the view to the recipient, and whilst the location cannot change, the opinion of the viewer can vary as people will generally have different responses to a change in view depending on their location, the activity they are engaged in and other factors, including the weather and the time of day/year.

Method for Assessing Visual effects

2.4.9 GLVIA3 (Ref 1.3) states that the sensitivity of visual receptors should be assessed in terms of the susceptibility of the receptor to a change in view and/or visual amenity and the value attached to that view. The magnitude of change should be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect.

2.4.10 These aspects are considered together, to form a professional judgement regarding the overall significance of visual effect, as illustrated in GLVIA3 Figure 6.1 (Page 99) (Ref 1.3). The remainder of this appendix sets out the methodology in more detail.

Value of the View

2.4.11 The baseline includes a description of the relative value of the view experienced at each viewpoint location and is unrelated to the nature of the Project.

2.4.12 GLVIA3 (Ref 1.3) explains at paragraph 6.37 that the value of a view depends on:

- *'recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations; and*
- *indicators of the value attached by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment… and references to them in literature or art…'*

2.4.13 A professional judgement on the value of a view is provided in the baseline description for each viewpoint based on desk-based study and field survey. Each viewpoint location has been visited to inform the preliminary assessment and further visits will be undertaken to inform the detailed assessment. Photographs illustrating the view at each location are included in the baseline description provided in **Appendix 7.2 Proposed Viewpoints**.

2.4.14 The value of the view is categorised as very high, high, medium, or low by applying the indicators listed in Table 2.2. Professional judgements are supported by narrative description linked back to evidence from the baseline study to explain the conclusions reached.

Table 2.2 - Indicators of view value

Category	Indicators
Very High	Iconic view of national or international importance, or a view which is associated with a nationally or internationally designated landscape or heritage asset, the cultural associations of which are widely recognised in art, literature, or other media.
High	Highly scenic view associated with a landscape or heritage asset of national or regional importance, the cultural associations of which are regularly recognised in art, literature, or other media.
Medium	The value of such views may have been identified as part of the consultation process and through site visits. Elements or features within the view are likely to be in good condition, with few discordant elements or features.
Low	Although the view may be valuable to the local community, the location has no formal planning status, is in an area of ordinary landscape value with some discordant elements or features. The value of such views to the local community may have been identified as part of the consultation process and through site visits.

Establishing Visual Sensitivity

2.4.15 The next step in assessing the importance of the likely visual effects is to determine the sensitivity of the visual receptors to the Project.

2.4.16 The sensitivity of visual receptors is assessed through two separate considerations:

- Value - established and reported as part of the baseline assessment as explained above.
- Susceptibility to change - determined through informed professional judgement, guided by the indicators set out in Table 2.3 below.

2.4.17 This approach involves separating sensitivity into value and susceptibility, which slightly differs from the general assessment methodology presented in **Chapter 5 Approach to Preparing the PEIR** in Volume 2. However, it aligns with guidance in GLVIA3 (Ref 1.3) and associated Notes and Clarifications (Ref 1.4).

2.4.18 The susceptibility of the visual receptors to change is categorised as very high, high, medium, or low by applying the indicators listed in Table 2.3. Professional judgements are supported by narrative description linked back to evidence from the baseline study to explain the conclusions reached.

Table 2.3 - Indicators of visual receptor susceptibility

Category	Indicators
Very High	People visiting locations purely to experience the view and where there is typically a prolonged viewing opportunity. Examples include: • People living and moving around communities where the views are widely recognised as being of the outstanding scenic quality (typically within or to a nationally designated landscape). • People engaged in outdoor recreation where the views are of the highest scenic quality (including views from nationally designated or regionally promoted trails and panoramic viewpoints – often marked on Ordnance Survey plans and providing interpretation facilities). • Visitors to heritage assets or other tourist and visitor attractions where the views are of the highest scenic quality and make an important contribution to the experience.
High	People whose attention or interest is likely to be focused on the view and where there is typically a prolonged viewing opportunity. Examples include: • People living and moving around communities where views contribute to the landscape setting enjoyed by residents. • People engaged in outdoor recreation (including public rights of way) whose interest is likely to be focused on the landscape. • Visitors to heritage assets where views of the surrounding landscape make an important contribution to the experience. • People travelling on scenic and tourist routes, where attention is focused on the surrounding landscape.
Medium	People whose attention or interest may partially be on the appreciation of their surroundings. Examples include: • People travelling on local roads who may have some interest in their surroundings, but the view is transitory. • People at their place of work whose attention is on their surroundings and where the setting is important to their quality of working life. • People taking part in outdoor sport or recreation which does not involve appreciation of the view.
Low	People whose attention or focus is on other activities, not on their surroundings. Examples include:

Category	Indicators
	• Travellers on major road or rail routes, which are not scenic or tourist routes and where the view is typically experienced at speed. • People at their place of work whose attention is not on their surroundings and where setting is not important to their quality of working life. • People taking part in outdoor sport or recreation which does not involve appreciation of the view.

2.4.19 Paragraph 6.35 of GLVIA3 (Ref 1.3) notes that:

'*these divisions are not black and white and in reality, there will be gradation in susceptibility to change. Each project needs to consider the nature of the groups of people who will be affected and the extent to which their attention is likely to be focused on views and visual amenity*'.

2.4.20 In accordance with paragraph 5.5 of GLVIA3 (Ref 1.3) and note 5(9) of the Notes and Clarifications (Ref 1.4) professional judgements on view value and visual receptors' susceptibility will not be combined to arrive at a professional judgement on sensitivity but will separately influence the assessment as part of the overall profile approach which is explained later in this appendix.

2.5 Predicting Magnitude of Change

2.5.1 Paragraph 6.38 of GLVIA3 (Ref 1.3) sets out the criteria which should be considered in reaching a professional judgement on the magnitude of visual change. These include '*its size or scale, the geographical extent of the area influenced, and its duration and reversibility'*.

2.5.2 Page 7 Note 3(3) of the GLVIA3 Notes and Clarifications (Ref 1.4), explains that:

2.5.3 *'For magnitude of effect, it is likely that the size/scale of effect will be the most important factor, with geographical extent and duration/reversibility considered as 'modifiers'. When taking account of geographic extent and duration, care should be taken to ensure that the resulting magnitude of effect judgement is not understated'.*

Size and Scale of Effect

2.5.4 The size and scale of a visual change is dependent on the range of factors listed below and is assessed as large, medium, small or very small:

- The composition of the view with respect to the loss or addition of features in the view, including the nature of the view (full, partial, glimpsed) and the proportion of the view occupied by the Project.
- The distance of the viewpoint from the Project and how this affects its prominence.
- The angle of view affected which affects how much of the view is altered.
- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour, and texture.

- The presence of landform, buildings, or vegetation (including seasonal effects due to variations in deciduous leaf cover) which may wholly or partly obstruct views of the Project, allowing only partial or glimpsed views.
- The duration and nature of the visual effect. This can depend on the speed of travel which affects how long a view would be experienced (continuously, intermittently, glimpsed either once or repeatedly and sequentially along a route) and the possibility that a development would be noticed.
- The background or backdrop against which the Project is viewed as this can affect the degree of contrast and scale. For example, pylons, conductors, and other electricity infrastructure are more difficult to discern when viewed against a textured backdrop such as landform or vegetation than against an open sky background.

2.5.5 Other considerations, which can influence the magnitude of visual change include the level of activity in a scene, presence of noise or lighting, traffic movement, peoples' likely preferences and expectations, character and quality of the existing view (inevitably a point of professional judgement), nature of the scene (open and directionless, or visually contained by enclosing features) and any other elements that affect How people experience a view.

2.5.6 Wireline visualisations will be prepared to illustrate the existing views from each viewpoint and a selection of viewpoints will be illustrated with photomontage visualisations to provide a photorealistic illustration of the likely changes to a selection of views. These will be presented in the visual chapter of the ES.

Geographical Extent of Effect

2.5.7 Geographical extent in the context of visual assessment refers to the area over which changes would be noticeable, for example whether the Project is visible from a single location or represents a larger area with similar views. Geographical extent is described as large, medium, or small. Professional judgements are informed by the spatial distribution and the level of effect identified at each representative viewpoint. Page 16 Note 6(8) of the GLVIA3 Notes and Clarifications (Ref 1.4), explains that:

'Geographical extent should reflect the relevance of the location and spread of effect.... For example, in considering views from a long-distance footpath it may be relevant to consider both the frequency of use of particular parts of the route and the degree to which visibility arises from those parts of the route. Open views of a development from long stretches of a more frequently used section would be expected to contribute to a greater extent (and magnitude) of effect than a glimpsed view from an overgrown section with little sign of recent use'.

2.5.8 This explanation also allows for the number of people that would experience a change to their view to be brought into the assessment. people affected i.e., whether the identified effect affects a relatively small or relatively large number of people.

Duration and Reversibility

2.5.9 The design life of the Project is at least 80 years but with regular maintenance is likely to extend further. Paragraph 5.51 of GLVIA3 (Ref 1.3) states that duration *'can usually be simply judged on a scale such as short term, medium term or long term*'.

2.5.10 For the purposes of the assessment, duration is determined in relation to the phases of the Project as follows:

- **Short term** – assumed to cover construction period plus one-year reinstatement.
- **Medium term** – assumed to be 2-15 years post construction and include the effects of permanent vegetation loss on the baseline environment.
- **Long term** – assumed to be of a duration that extends longer than 15 years post construction once any committed mitigation planting has achieved its intended function.

2.5.11 The duration of the effect can also be described as transient (whether continuous or intermittent) or seasonal (views which would be subject to seasonal leaf cover).

2.5.12 In accordance with the principles contained within GLVIA3 (Ref 1.3), reversibility is reported as reversible (temporary) or irreversible (permanent), and is related to whether the change can be reversed at the end of the construction phase or at the end of the operational lifespan of the Project).

Making Professional Judgements

2.5.13 Combining the three separate considerations (i.e., size and scale of effect, geographical extent of effect, and duration and reversibility) in one overall rating for magnitude of change can distort the aim of identifying significant effects. For example, an greater magnitude of change, based on size/scale, may be reduced to a lower rating if it occurred in a localised area or for a short duration. This might mean that a potentially significant effect may be overlooked if impacts are moderated down due to their geographical extents and/or duration/reversibility. To address this, professional judgements on magnitude of change are initially based on the size/scale of the effect and then moderated to account for the duration of the change and its reversibility. Additionally, a separate description of the geographical distribution of effects across the study area is provided in the visual assessment summary to ensure that significant effects are not overlooked.

2.5.14 The magnitude of visual change is categorised as large, medium, small or very small by applying the indicators listed in Table 2.4. Professional judgements are supported by a narrative description linked back to evidence from the baseline study to explain the conclusions reached.

Table 2.4 - Indicators of magnitude of visual change

Category	Indicators
Large	• The Project would be prominent in the view and result in a substantial change to the composition and character of the existing view and how it is perceived. Typically, this would be where the Project would be seen in close proximity. Much of the view would be affected and there would be little backgrounding to reduce the degree of visual contrast. The duration/reversibility of effect is likely to be long-term and potentially reversible .
Medium	• The Project would be very noticeable and result in a noticeable change to the composition and character of the existing view and how it is perceived. Typically, this would be where the Project would be seen in mid-range views but would still be conspicuous and well-defined. Only

Category	Indicators
	part of the view may be affected and there may be some backgrounding to reduce the degree of visual contrast. • The duration/reversibility of effect is likely to be long-term and irreversible (permanent).
Small	• The Project would form a small part of the view and result in a slight change to the composition and character of the existing view and how it is perceived. Typically, this would be where the Project would be seen in mid-range or distant views but would be indistinct and/or partially obscured. Only a small part of the view would be affected and there may be a high level of backgrounding to reduce the degree of visual contrast. • The duration/reversibility of effect is likely to be medium-term and potentially reversible.
Very small	• The Project would be very indistinct and result in a barely perceptible change to the character and quality of the existing view and how it is perceived. Typically, this would be where a development would form part of a long-distance panoramic view and/or where a very small proportion of the view is affected. There may be a high level of backgrounding to reduce the degree of visual contrast. • The duration/reversibility of effect is likely to be short-term and reversible.

2.5.15 The assessment also identifies areas where no visual change is anticipated. In these instances, 'no change' is inserted into the appropriate magnitude of change column and the resulting effect is identified as 'no effect'.

2.6 Judging Levels of Visual Effect

2.6.1 The final step in the assessment involves combining professional judgements on sensitivity and magnitude of change to arrive at an informed, professional evaluation of the significance of each visual effect.

2.6.2 In accordance with GLVIA3 (Ref 1.3) and the associated Notes and Clarifications (Ref 1.4), a rigid matrix approach—where effect levels are determined solely by combining sensitivity (nature of receptor) with magnitude of change (nature of effect) is not applied. Instead

2.6.3 Instead, the evaluations of individual aspects described above (value, susceptibility, size and scale, geographical extent, duration, and reversibility) are considered together to build an overall profile for each identified effect. An overview of the distribution of professional judgements for these aspects is then taken, allowing for a more complete understanding of how various factors collectively contribute to the overall visual effect. This process draws on good practice principles outlined in GLVIA3 (Ref 1.3) and is guided by the indicators in Table 2.5.

2.6.4 In the visual chapter of the ES, levels of effect will be categorised as negligible, minor, moderate, or major in accordance with the indicators in Table 2.5. Effects judged to be moderate or major are considered significant under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, hereafter referred to as the EIA Regulations (Ref 1.12).

2.6.5 The preliminary assessment presented in **Chapter 7 Visual**, only categorises effects as 'significant' or 'not significant'. Coming to a professional judgement on the level of effect requires more detailed knowledge of the magnitude of change for receptors which will become available as the Project develops. This for example includes the production of wirelines for viewpoint locations and additional site surveys.

2.6.6 Given the nature of the Project, the direction of change is considered adverse unless otherwise stated.

Table 2.5 - Categories and indicators of significance

Category	Indicators	Significant effect
Major	The Project will result in an obvious change in the view, likely affecting a visual receptor with a moderate or high susceptibility to that type of change. This level of effect may also occur when a medium scale of effect acts on a nationally valued view and/or a high susceptibility receptor. The effect is likely to be long-term and affect a relatively large area or relatively large number of people.	**Yes**
Moderate	The Project will result in a noticeable change in the view, likely affecting a viewer with a moderate susceptibility to that type of change and or locally valued view. This level of effect may also occur when a smaller scale of change acts on a higher susceptibility receptor or affects a large number of people, or a larger scale of effect acting on a lower susceptibility receptor or affecting fewer people. This level of effect may also occur when a large scale of effect occurs over a relatively short period or over a small area/affects few people.	**Yes**
Minor	The development will result in a small change in the view over a long-term duration, likely affecting a smaller geographic extent and/ or fewer people. This level of effect may also occur when a larger scale of effect is of short-term duration or is confined in its geographical extent.	No
Negligible	The Project will result in a barely perceptible alteration to the view.	No

2.6.7 The assessment considers the effects at construction, in year 1 operation, and year 15 operation

- Construction Phase - During this phase, the assessment will evaluate the visual effects of construction activities. Year 1 of Operation - At this stage, the assessment examines the effects once the project is operational but without the full benefit of any mitigation measures (like newly planted trees or vegetation). It focuses on the initial operation impacts, such as the presence of the new infrastructure and any mitigation earthworks.
- Year 15 of Operation - By this time, any mitigation strategies such as new planting should be fully established. The assessment will examine the long-term effects, taking into account how the mature vegetation has helped reduce the impacts.

2.6.8 This approach ensures a comprehensive evaluation of both immediate and long-term effects.

2.7 Mitigation and Residual Effects

2.7.1 The design is being developed iteratively with the assessment process. This means that wherever possible, measures have been incorporated to avoid or reduce likely significant adverse effects.

2.7.2 The most effective mitigation measures are ones which are integrated into the Project. A distinction is therefore made between measures designed as an intrinsic part of the Project (embedded or control and management measures) and those which are intended to specifically counteract any potential residual negative effects of the Project (additional measures).

2.7.3 Significant residual visual effects remaining after proposed mitigation are summarised as the final step in the assessment process.

2.7.4 Each of the significance categories covers a broad range of effects and represents a continuum or sliding scale. Where an effect falls at the upper or lower end of the category, this will be noted and explained as part of the detailed assessment presented in the visual chapter of the ES.

3. Residential Visual Amenity

3.1 Background

The Landscape Institute's (LI) Residential Visual Amenity Assessment (RVAA) guidance (TGN 2/19) (Ref 1.7) sets out an approach to the assessment of potential effects on residential visual amenity. Paragraph 1.2 of TGN 2/19 (Ref 1.7) defines residential visual amenity as:

'*the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage'.*

3.1.1 Residential visual amenity is one component of 'Residential Amenity' which also includes other components of residential amenity including noise, vibration, air quality, access to daylight etc. and which may otherwise be referred to collectively *as 'living conditions*'.

3.1.2 The main difference between RVAA and landscape and visual impact assessment (LVIA) is that RVAA focuses on private views from individual properties whilst LVIA focusses on public views and wider visual amenity.

3.1.3 Paragraph 6.17 of GLVIA3 (Ref 1.3) reinforces TGN 2/19 (Ref 1.7), stating that:

'*Effects of development on private property are frequently dealt with mainly through residential amenity assessments. These are separate from LVIA although visual effects assessment may sometimes be carried out as part of a residential amenity assessment, in which case this will supplement and form part of the normal LVIA for a project'*.

3.1.4 Changes in views and visual amenity because of development are considered in the planning process. In respect of private views and visual amenity, it is widely accepted that no one has *'a right to a view'*. This includes situations where a residential property's outlook is judged to be 'significantly' affected by a proposed development, a matter which has been confirmed in several appeal/public inquiry decisions.

3.1.5 It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence because of new development being introduced into the landscape. This does not in itself necessarily cause particular planning concern. However, there are situations where the views of a proposed development from a property or its curtilage are judged to be so overbearing or unavoidable that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before.

3.1.6 Paragraph 2.1 of TGN 2/19 (Ref 1.7) introduces an approach to considering a potential '*Residential Visual Amenity Threshold'*, beyond which effects may be of:

'*such nature and/or magnitude that it potentially affects 'living conditions' or residential amenity'*.

3.1.7 Determining whether the threshold has been reached requires informed professional judgement.

3.1.8 LVIA findings of significant (adverse) visual effects at a residential property do not automatically imply the need for an RVAA. However, for properties close to a

development proposal, and which experience a large magnitude of visual change and major adverse effect, an RVAA may be appropriate to establish whether the Residential Visual Amenity Threshold is likely to be, or has been, reached.

3.2 Methodology for RVAA

3.2.1 Section 4 of TGN 2/19 (Ref 1.7) recommends a four-step approach which draws heavily on the GLVIA3 (Ref 1.3) principles and process.

3.2.2 The first three steps of the approach:

'fall broadly within the normal scope of LVIA consisting of an assessment of the magnitude and significance of visual effect (in the EIA context) and change to visual amenity likely to be experienced by occupants at those individual residential properties which were identified'.

The fourth step:

'requires a further assessment of change to visual amenity examining whether the Residential Visual Amenity Threshold is likely to be, or has been, reached. Whether or not this final step is engaged depends on the circumstances specific to the case'.

3.2.3 The following text summarises the four steps and how they are applied to the Project.

Step 1: Definition of Study Area and Scope of the Assessment

3.2.4 In accordance with the principles of the Holford Rules (Ref 1.8), avoiding settlements and residential properties is an important consideration of the routeing process for the Project in order to avoid or minimise the potential for significant effects on the views and visual amenity of residential receptors.

3.2.5 The detailed routeing process will make every effort to maintain a minimum distance of 150 m between a residential property and the Project. In addition, the routeing process will seek to avoid introducing pylons into the key/principal views from residential properties. This will be informed by observations made during field work which will consider the orientation of properties, the likely availability of views from the property and its curtilage and the presence of intervening screening features (e.g., localised landform, woodland, forestry and vegetation, buildings and other landscape features). Nevertheless, given the nature of the development, the potential is likely to remain for significant visual effects in relation to views and visual amenity, experienced from residential properties near the Project.

3.2.6 To determine whether more detailed consideration of effects on views and visual amenity from residential properties is required in the form of an RVAA, any property where occupants are likely to experience significant adverse effects that are judged to be major will be included in the assessment.

3.2.7 Properties will be assessed individually, but if their outlook and/or views are in all aspects the same (for example if a development is visible from the rear gardens only of a small row of houses) they will potentially be assessed as one group. This will be at the discretion of the assessor and will be supported by a clear explanation of the reason for the grouping or clustering.

Step 2: Evaluation of Baseline Visual Amenity and Receptor Sensitivity

3.2.8 As outlined in paragraph 4.23 of TGN 2/19 (Ref 1.7), residents at home are considered to have high susceptibility to changes in their view, whether from the property itself, its curtilage or its access.

3.2.9 Paragraph 6.36 of GLVIA3 (Ref 1.3) states that:

'in the assessment of visual effects it will be important to recognise that residents may be particularly susceptible to changes in their visual amenity - residents at home, especially using rooms normally occupied in waking or daylight hours, are likely to experience views for longer than those briefly passing through an area'.

3.2.10 Whilst an appreciation of the surrounding views is often material to the quality of life experienced by residents, and therefore the value of their private views is typically considered by residents to be high, this is not always the case. Professional judgment will be applied to describe the views experienced in terms of their nature, extent, and quality. This will include the direction of the view, the orientation of buildings, location of the access to garden or curtilage areas, and the presence of intervening features such as vegetation, with the seasonality of vegetation screening and potential changes to forestry being referred to where applicable. The presence of other existing transmission infrastructure, or other infrastructure will also be noted.

3.2.11 Taking account of the high susceptibility of receptors and assuming that the value of the views is high, the overall sensitivity of residential receptors is typically judged to be high.

Step 3: Assessment of Likely Change to Visual Amenity Experienced by Residents

3.2.12 Ref 1.3Step 3 will identify those properties requiring further assessment in Step 4 by reviewing the results of the viewpoint assessment to identify residential properties where the effect on the residents' visual amenity is so great that the Project is against the public interest as explained in TGN 2/19 (Ref 1.9). This is most likely to be in locations where major visual effects are predicted.

3.2.13 Considerations set out in TGN 2/19 (Ref 1.7) which provide a framework for describing and evaluating the predicted magnitude of visual change and related visual amenity effects which may lead to the property being considered in Step 4 include:

- *'distance of property from the proposed development having regard to its size scale and location relative to the property (e.g. on higher or lower ground);*
- *type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be affected, having regard to seasonal and diurnal variations;*
- *direction of view/aspect of property affected, having regard to both the main/primary and peripheral/secondary views from the property;*
- *extent to which development/landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;*

- *scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;*
- *degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;*
- *duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc.; and*
- *mitigation opportunities – consider implications of both embedded and potential further mitigation'.*

3.2.14 This step will typically involve both desk study and detailed fieldwork but is unlikely to require visits to individual properties which, for the purposes of this step, can generally be assessed from the nearest publicly available vantage/access point. Where this is not feasible then visits to certain individual properties (or clusters of) may be appropriate.

3.2.15 Step 3 concludes by identifying which properties should be assessed further in the final step in order to reach a professional judgement regarding the Residential Visual Amenity Threshold.

Step 4: Forming the Residential Visual Amenity Professional Judgement

3.2.16 The final step of RVAA will involve a more detailed examination of the predicted effects on the residential visual amenity at those properties identified for further assessment in the previous step. There is an important distinction between this concluding step of RVAA and the preceding one.

3.2.17 In Step 3 the assessment will reach a conclusion with respect to magnitude and (EIA) significance of visual effect, and the change in visual amenity at the property. In this final step, properties that are predicted to experience the highest category of visual effect (major) will be subject to a further professional judgement associated with the Residential Visual Amenity Threshold.

3.2.18 As detailed in TGN 2/19 (Ref 1.7):

'*This concluding judgement should advise the decision maker whether the predicted effects on visual amenity and views at the property are such that it has reached the Residential Visual Amenity Threshold, therefore potentially becoming a matter of Residential Amenity. This judgement should be explained in narrative setting out why the effects are considered to reach the Residential Visual Amenity Threshold. Equally, judgements should explain why the threshold has not been reached'*.

3.2.19 The main point regarding Step 4 is that the professional judgement required in this final, concluding step:

'*goes beyond the assessment undertaken in Step 3 which is restricted to judging the magnitude and significance of visual effect, typically as a supplement to the accompanying LVIA*'.

3.2.20 If effects identified within the LVIA undertaken during Step 3, and in accordance with GLVIA3 (Ref 1.3) principles and processes, require further consideration, Step 4 will be undertaken in accordance with the approach advocated in TGN 2/19 (Ref 1.7).

4. Technical Information

4.1 Baseline Photography

General Site Photography

4.1.1 Baseline photographs have been taken using a Canon EOS digital SLR camera with a full frame sensor (36 x 24 mm) using a 50 mm fixed focal length lens. Photographs are taken in accordance with best practice guidance, including the Landscape Institute's TGN 06/19 (Ref 1.5), and their location recorded using an on-site handheld GPS (Type 3 LI TGN 06/19). Where required, the resulting images are stitched together using specialist PTGui software to create 90° panoramic baseline views. The time at which the photographs are taken, and the prevailing weather conditions are recorded for each viewpoint. For general site photography, 360° panoramas are taken unless there are privacy issues in relation to nearby properties.

4.1.2 Photographs are taken in clear lighting conditions wherever possible.

Photography for Photomontage

4.1.3 Baseline photography is required for the production of photomontages to accurately represent the Project. This type of photography will require a higher level of accuracy and will be subject to additional survey methods in line with TGN 06/19 (Ref 1.5). A full methodology for the photography for photomontage (Type 4 LI TGN 06/19) is presented in **Volume 4 Photomontages**.

4.2 Wireframes

4.2.1 Wireframe diagrams (Type 2 LI TGN 06/19) will be prepared showing the outline of the Project. These are computer-generated line drawings, based on the digital terrain model combined with information about the location and scale of components of the project, to give a relatively simple indication of how the Project would appear from different viewpoints. Wireframe diagrams produced for all viewpoints will be presented in the ES.

4.2.2 For each viewpoint, wireframe renders will be generated using software called TrueViewVisuals. These are based on a digital terrain dataset (Ordnance Survey (OS) Terrain 50) using a model of the project to provide an accurate depiction of the appearance of the Project.

4.2.3 The wireframes will represent the maximum theoretical visibility of the development on bare ground (i.e., assuming no vegetation, buildings or other vertical structures are present to provide any screening). In reality, the visibility also depends on both the weather and the lighting conditions. The existing 400 kV overhead lines to be retained will also be included on the baseline wireframes for comparison against the wireframes of the Project.

4.3 Zone of Theoretical Visibility

4.3.1 To help identify the locations from which the proposed 400 kV overhead line would be visible, a preliminary ZTV map has been prepared for the Project. ZTV maps are essential for refining the study area and assessing the potential visual effects of the project. While the ZTV maps show theoretical visibility, actual visibility might be reduced in areas with extensive vegetation. Therefore, professional judgment is used to focus on areas with the most significant potential visual impacts. Although significant effects beyond 5 km are unlikely, the 10 km cut-off for the ZTV is used to:

- Assess cumulative visual impacts with other developments;
- Assess the effects of the taller pylons at the River Ouse crossing; and
- Identify effects on distant but highly susceptible visual receptors.

4.3.2 ZTV maps are created using recent topographic data and assume an eye level of 1.6m (representing an average-height person). The accuracy of the maps is verified on-site following guidance from TGN 06/19 (Ref 1.5). This approach ensures that the potential visual impact of the project is assessed comprehensively and in line with professional standards.

4.3.3 ZTV maps take account of the following factors:

- The existing topography using OS terrain 50 data;
- Existing buildings by applying an 8 m average height to the OS Mastermap layer; and
- Existing woodland cover by applying a 15 m average height to the National Forest Inventory (Ref 1.13) which is produced by the Forestry Commission and records all forests and woodlands with an area of 0.5 ha and over.

4.3.4 Individual and small groups of trees are excluded as particularly during winter, these will provide only minimal screening of the Project.

4.4 Assumptions and Limitations

4.4.1 The visual assessment relies on professional judgement.

4.4.2 All baseline surveys are conducted on publicly accessible land. If access is not possible from publicly accessible areas, professional judgement is used to estimate and document the likely effects.

4.4.3 ZTV maps have not been prepared for the construction phase of the Project due to the significant variability in the extent and duration of visibility of construction activities.

4.4.4 The tallest equipment expected during construction are tower cranes. These cranes would be moved consecutively along the route and the resulting effects are transient and short term.

5. References

Ref 1.1 National Grid (2023). North Humber to High Marnham Environmental Impact Assessment Scoping Report. [Online]. Available at: https://www.infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020034/EN020034-000009-EN020034.pdf [Accessed: November 2024].

Ref 1.2 National Grid (2024). Scoping Opinion: Proposed North Humber to High Marnham Scoping Opinion Responses [Online]. Available at: https://www.national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN020034/documents [Accessed: November 2024].

Ref 1.3 Landscape Institute and Institute for Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment – 3rd Edition. Abingdon: Routledge.

Ref 1.4 Landscape Institute and Institute for Environmental Management and Assessment (2024). Technical Guidance Note 01/24 Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment [Online]. Available at: https://www.landscapeinstitute.org/wp-content/uploads/2024/08/LITGN-2024-01-GLVIA3-NC_Aug-2024.pdf [Accessed: December 2024].

Ref 1.5 Landscape Institute and Institute for Environmental Management and Assessment (2019). Technical Guidance Note 06/19 Visual Representation of Development Proposal [Online]. Available at: https://www.landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf [Accessed: December 2024].

Ref 1.6 Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. [Online]. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment [Accessed: December 2024].

Ref 1.7 The Landscape Institute (2019). Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA). [Online]. Available at: https://www.landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf [Accessed: December 2024].

Ref 1.8 Department of Energy and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). [Online]. Available at: https://www.assets.publishing.service.gov.uk/media/64252f3b60a35e00120cb158/NPS_EN-1.pdf [Accessed: December 2024].

Ref 1.9 Department of Energy and Net Zero (2023). Overarching National Policy Statement for Electricity Networks Infrastructure (EN-5). [Online]. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 [Accessed: December 2024].

Ref 1.10 Gillespies (2014). Wind Turbines and Pylons: Guidance on the application of separation distances from residential properties [Online]. Available at: https://www.gwynedd.llyw.cymru/en/Council/Documents---Council/Strategies-and-policies/Environment-and-planning/Planning-policy/Supporting-documents/Wind-Turbines-and-Pylons---Separation-Guidance-(DC.019).pdf [Accessed: December 2024].

Ref 1.115 European Landscape Convention ETS No.176 ratified on the 21 November 2006.

Ref 1.12 Legislation.gov.uk (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [Online]. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents [Accessed: December 2024].

Ref 1.13 Forestry Commissions Open Data Site (2023). National Forest Inventory 2023 [Online]. Available at: https://www.data-forestry.opendata.arcgis.com/search?collection=Dataset&q=national%20forest%20inventory%20woodland%20england [Accessed: December 2024].

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