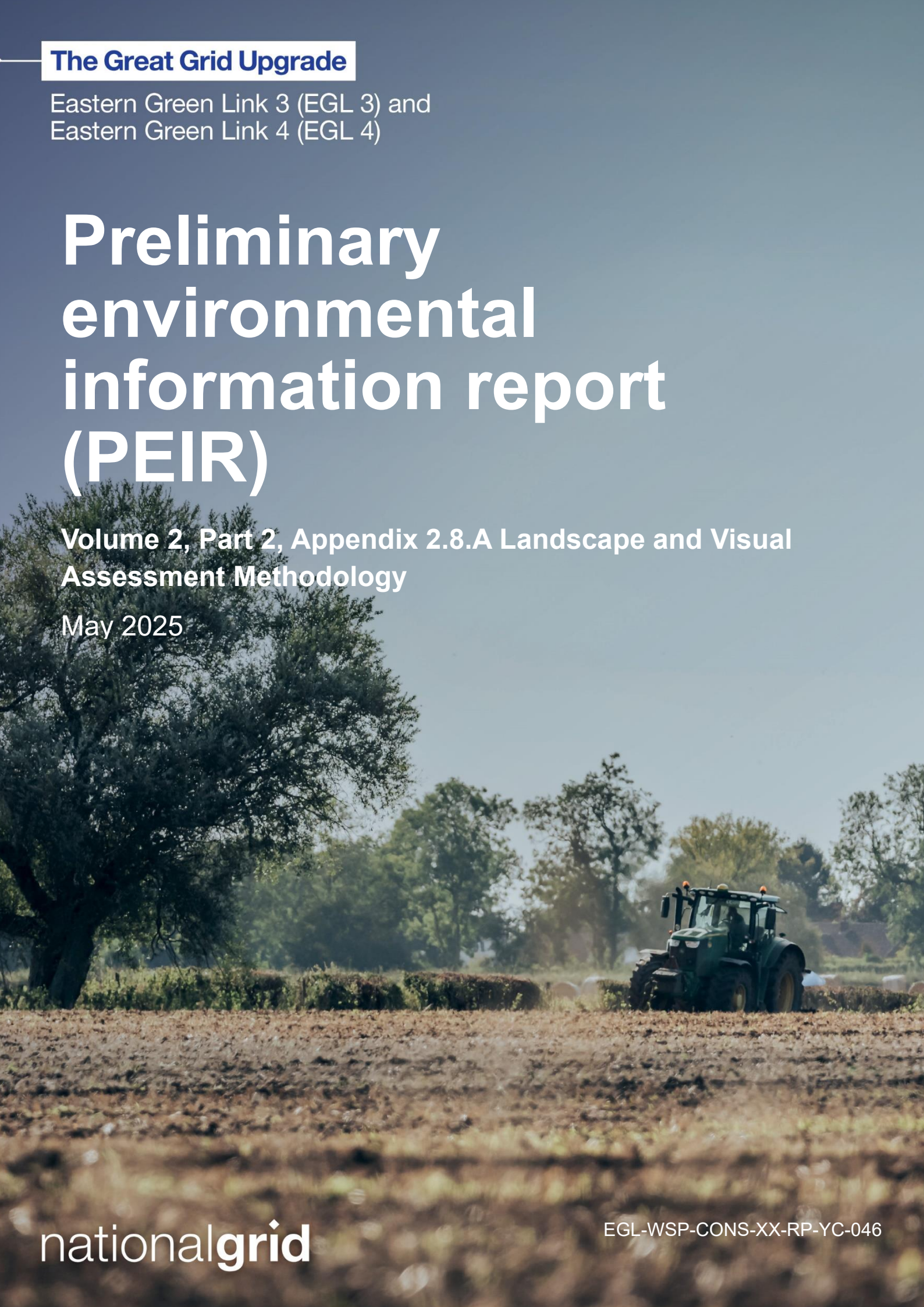
The Great Grid Upgrade

Eastern Green Link 3 (EGL 3) and
Eastern Green Link 4 (EGL 4)

Preliminary environmental information report (PEIR)

Volume 2, Part 2, Appendix 2.8.A Landscape and Visual Assessment Methodology

May 2025



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2.8.A. Landscape and Visual Assessment Methodology

2.8.A.1. Introduction

2.8.A.1.1. This appendix outlines the detailed methodology used for the Landscape and Visual Assessment of the English Onshore Scheme reported in **Volume 1, Part 1, Chapter 8: Landscape and Visual**. It sets out the approach to determining the baseline conditions, the sensitivity of the receptors, and the magnitude of change alongside the significance criteria that would be used for the landscape and visual assessment.

2.8.A.1.2. This methodology for the Landscape and Visual Impact Assessment (LVIA) has been produced in accordance with best practices by an experienced landscape architect and a chartered member of the Landscape Institute.

2.8.A.1.3. The Landscape and Visual Assessment considers two distinct but closely related areas, landscape and visual effects:

- *Assessment of landscape effects: assessing effects on the landscape as a resource in its own right;*
- *Assessment of visual effects: assessing effects on specific views and on the general visual amenity experienced by people.*

2.8.A.2. Guidance

2.8.A.2.1. In addition to the guidance set out in **Volume 1, Part 1, Chapter 4: Description of the Projects**, the primary source of guidance for **Volume 1, Part 1, Chapter 8: Landscape and Visual** are Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) (Ref 2.8.A.1) published by Landscape Institute with the Institute of Environmental Management and Assessment (2013). The following sources (ordered by date) have also been referred to in the preparation of the methodology for the LVIA and production of visual representations:

- Natural England (2014). An Approach to Landscape Character Assessment (Ref 2.8.A.2);
- Landscape Institute (2019). Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19 (Ref 2.8.A.3);
- Natural England (2019) An approach to landscape sensitivity assessment – to inform spatial planning and land management-Consultation Draft (Ref 2.8.A.4);
- Landscape Institute (2021). Assessing Landscape Value outside National Designations Technical Guidance Note 02/21 (Ref 2.8.A.5); and
- Landscape Institute (2024). Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3) – Consultation (Ref 2.8.A.7).

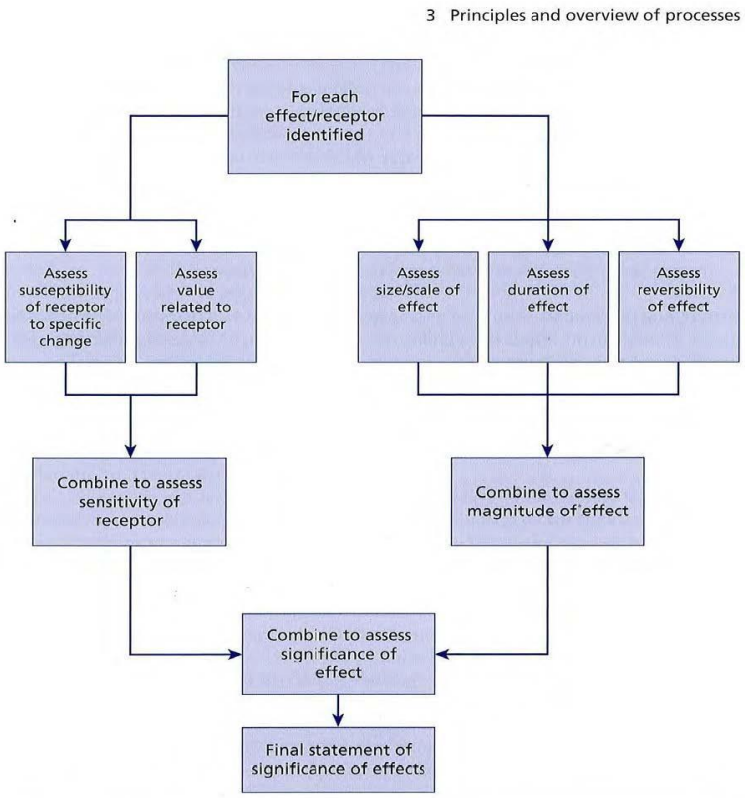
2.8.A.3. Approach Landscape and Visual Impact Assessment

2.8.A.3.1. The methodology is consistent with the approach and process set out in GLVIA3 (Ref. 2.8.A.1), as summarised in the Flow Diagram (GLVIA3) below, **Plate 2.8.A-1**.

2.8.A.3.2. In summary, the assessment involves the following key stages:

- *Establishment of the baseline conditions; the landscape character and visual context of the receiving environment and the sensitivity to change of these receptors;*
- *Contributions to the iterative process of design and mitigation based on understanding the nature, form and features of the Project in relation to the key landscape and visual sensitivities;*
- *An evaluation of the magnitude of change likely to result from the Project, both during construction and in operation on visual amenity and the landscape;*
- *An evaluation of the cumulative magnitude of change likely to result from the Project in conjunction with other similar existing or future developments, both during construction and in operation on visual amenity and the landscape resource;*
- *An assessment of the significance of landscape and visual effects considering the sensitivity of resources and the magnitude of change; and*
- *An assessment of the cumulative significance of landscape and visual effects considering the sensitivity of resources and the magnitude of change.*

Plate 2.8.A-1: Flow Diagram (GLVIA3)



2.8.A.4. Future baseline

2.8.A.4.1. As stated in **Volume 1, Part 1, Chapter 4: Description of the Projects**, the assessment has considered the 'future baseline' - how the current baseline conditions may change to the point of construction. Due to the uncertainty and lack of reliable data associated with future conditions, a detailed consideration of the effects of the English Onshore Scheme against the future baseline have considerable limitations. Therefore, the future baseline relevant to LVIA is considered with reference to high-level assumptions in the context of limited data available and covers primarily cumulative assessment alongside high level assumptions regarding the predicted change, land use and climate change.

2.8.A.5. Study Area

2.8.A.5.1. The extent of the study area has been informed by the review of information, desktop studies, and field surveys for the English Onshore Scheme. The extent of the study area has been agreed with statutory consultees at the scoping stage and reviewed throughout the design evolution of the English Onshore Scheme.

2.8.A.6. Information and data sources

2.8.A.6.1. Baseline studies were undertaken through baseline data collection through a desktop study of the draft Order Limits. The desktop study identifies information such as landscape-related planning designations, landscape character typology, land use, and landscape patterns, including man-made features, as well as initial visibility identification from key locations such as routes and settlements.

2.8.A.6.2. The desktop studies are based on a review of information included within Geographical Information Systems (GIS) and Google Earth (Ref 2.8.A.6) and are used to explore the potential visibility. Desktop studies also include published Landscape Character Assessments and Local Plan Documents. Selection of visual receptors has been informed by analysis of Zone(s) of Theoretical Visibility (ZTV) and Google Earth. The technical methodology for producing ZTVs and visualisations is provided below.

2.8.A.7. Landscape Assessment Methodology

Landscape Sensitivity

2.8.A.7.1. The sensitivity of landscape receptors is determined by combining judgments about the value attached to the landscape (established and reported as part of the baseline) with judgments about the landscape susceptibility to change arising from the English Onshore Scheme.

2.8.A.7.2. Judgements on the value attached to the landscape baseline are unrelated to the nature of the project proposed, whilst judgements on susceptibility may vary in response to the type of project proposed and the attributes of the area in which it is to be located.

2.8.A.8. Landscape value

2.8.A.8.1. Landscape value is frequently addressed by reference to international, national, regional and local designations determined by statutory bodies and planning authorities. However, the absence of such a designation does not necessarily imply a lack of quality or value. Various other factors are considered in determining landscape value, which can render areas of nationally unremarkable quality valuable as a local landscape resource. A range of landscape value factors have been included in **Table 2.8.A.1** below.

Table 2.8.A.1 Landscape value factors

Factors	Sub - criteria
Landscape designations, national, regional and local	The presence of designations such as National Parks, National Landscapes, Heritage Coast, and local landscape designations, including consideration of special qualities, distance, relationships, and extent of setting.
Nature conservation and heritage designations/interest	The presence of ecological designations and interests that contribute to a sense of place and landscape character, e.g., SSSI, Ramsar Sites, SAC, and SPA alongside habitats and other areas of ecological interest. The presence of historic designations such as WHS sites, Scheduled Monuments, Listed Buildings, Historic Parks and Gardens, Conservation Areas and their setting.
Recreational value	The presence of open access land, common land, and public rights of way (particularly National Trails, Long Distance Paths, and Coastal Paths) where recreation is connected to the appreciation of the landscape. Areas with good accessibility that provide opportunities for other outdoor recreational activities.
Landscape condition	Physical state of individual elements and overall landscape character.
Perceptual (scenic value, strength of character)	Published information, that promotes the availability of protected views and areas visited for particular scenic qualities or views. Unique combinations of landscape features, e.g., dramatic or striking landforms or harmonious combinations of land cover.
Perceptual (Wildness and tranquillity)	Perception of wildness and tranquillity linked to nature, dark skies, presence of wildlife, or relative peace and quiet.
Other special qualities	The presence of distinctive features, such as dunes within the coastal landscape, fens, estate parkland, and other features, adds to the special qualities and strength of character.

2.8.A.8.2. The evaluation of landscape value has been undertaken with reference to a four-point scale, ranging from very high to negligible, as outlined in **Table 2.8.A.2** below.

Table 2.8.A.2 Landscape value levels

Landscape value	Typical description
High	The landscape is likely to be valued for several of its attributes at the international, national, and regional levels. It is frequently protected by a statutory landscape designation, such as a World Heritage Site, National Park, or National Landscape, or is designated at the local level, such as Areas of Great Landscape Value. The landscape is largely intact and may contain elements/features that are rare or distinct, but they are perceived as valued landscapes at the regional and local level. The landscape typically has a strong sense of place.
Medium	Typically, it is an undesignated landscape. It contains a few landscape features worthy of conservation, with little evidence of degradation. The landscape is ordinary, with commonplace elements of limited variety and distinctiveness. The landscape may contain elements/features representative of community or local-level attributes and cultural associations. The landscape may provide some scenic and landscape quality and some recreational opportunities.
Low	Typically, it is an undesignated landscape. This landscape is likely to be valued to a limited extent locally. It may contain common features and, therefore, does not specifically contribute to the wider landscape or cultural associations. Landscapes with evidence of degradation where detracting features are common. This landscape is of limited scenic quality, with few recreational opportunities.
Negligible	It is typically an undesignated landscape, typically degraded, with many detracting features and few features worth retaining. This landscape has been subject to strong man-made influences. It contains commonplace features of low ecological value that contribute little to the cultural associations and have no recreational value.

2.8.A.9. Landscape susceptibility

2.8.A.9.1. Susceptibility is defined by GLVIA3 (Ref 2.8.A.1) as “the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies” (GLVIA3 paragraph 5.40).

2.8.A.9.2. The landscape susceptibility criteria of the receiving landscape are reflected in **Table 2.8.A.3** and would be used to assess its susceptibility to the English Onshore Scheme.

Table 2.8.A.3 Landscape susceptibility criteria

Criteria	Higher susceptibility	Lower susceptibility
Landform	Simple, low-laying or flat landform.	Complex and varied landforms.
Land use	Land use of higher susceptibility typically consists of a range of valuable features.	Land use of lower susceptibility is likely to comprise commonplace degraded features.
Woodlands, hedgerows and other vegetation	Frequent presence of woodlands and dense network of hedgerows.	Limited woodland and hedgerow cover.
Scale	Smaller scale landscapes, with distinct and frequent field boundaries and varied topography, are generally more susceptible.	Larger scale landscapes, with fewer field boundaries and flat topography, are generally less susceptible.
Openness and enclosure	Landscapes with a high degree of enclosure.	Landscapes with a low degree of enclosure.
Distinctive features	Landscapes with frequent presence of distinct landscape features.	Landscapes with few distinct features.
Perceptual aspects Scenic qualities	Frequent skyline views across attractive landscapes.	Occasional skyline views across more commonly present landscapes. Landscapes lacking attractive views.
Perceptual aspects (Wildness, tranquillity, cultural characteristic)	Landscapes that are more susceptible to change to perceptual characteristics.	Landscapes that are less susceptible to change to perceptual characteristics.
Direct/Indirect exposure	Landscapes affected directly.	Landscapes indirectly affected.

2.8.A.9.3. After consideration of a range of factors listed above, the overall judgment is made on a scale from high to negligible, as set out in **Table 2.8.A.4** Landscape susceptibility levels.

Table 2.8.A.4 Landscape susceptibility levels

Landscape susceptibility	
High	Low ability to accommodate the specific proposed change without undue consequences for maintaining the baseline situation (receptor value) and/or meeting relevant planning policies/strategies objectives.
Medium	Moderate ability to accommodate the specific proposed change; some undue consequences for the maintenance of the baseline situation (receptor value) and/or meeting of relevant planning policies/strategies objectives.
Low	High ability to accommodate the specific proposed change with little or no undue consequences for maintaining the baseline situation (receptor value) and/or meeting relevant planning policies/strategies objectives.
Negligible	Very high ability to accommodate the specific proposed change; no undue consequences for maintaining the baseline situation (receptor value) and/or meeting relevant planning policies/strategies objectives.

2.8.A.10. Landscape Sensitivity

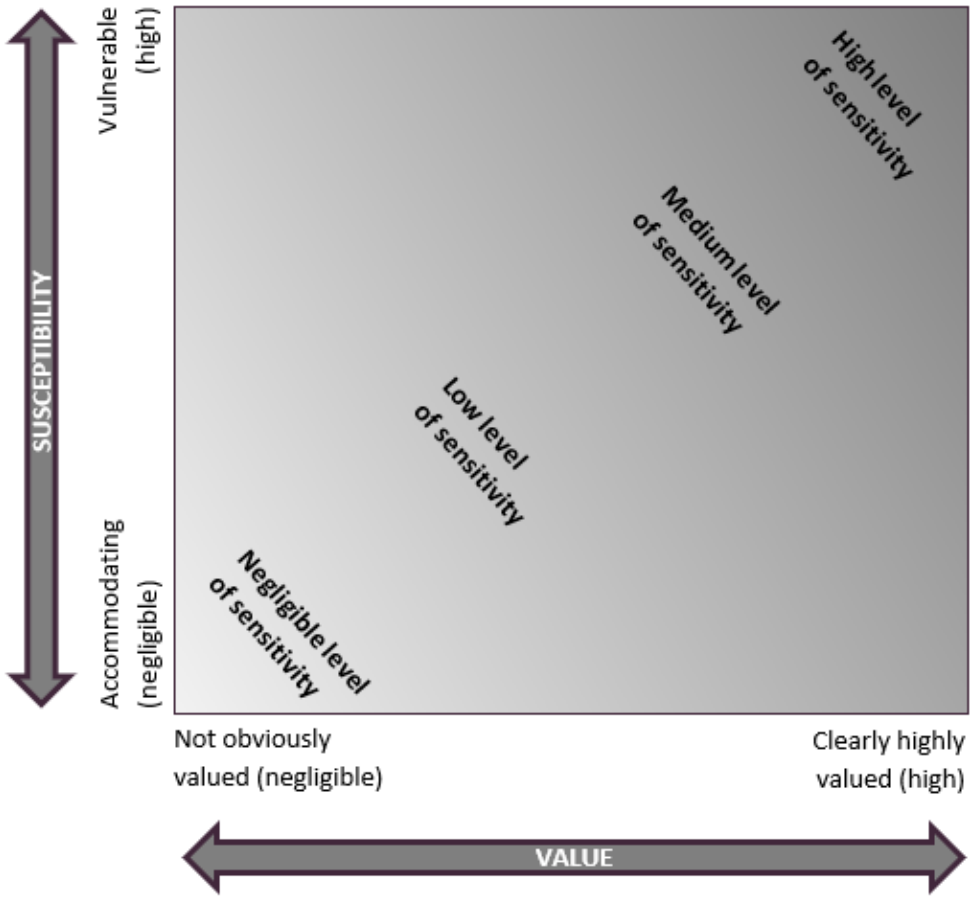
2.8.A.10.1. Susceptibility and value can be combined in different ways. However, it is generally accepted that a combination of high susceptibility and high value would likely result in the highest sensitivity. In contrast, a combination of low susceptibility and low value is likely to result in the lowest level of sensitivity. As noted in GLVIA3 (Ref 2.6.A.1), there can be complex relationships between the value attributed to a landscape and its susceptibility to change. This can be particularly important when considering changes in designated landscapes or those being considered for designated status.

2.8.A.10.2. The diagram presented as **Plate 2.8.A-2** illustrates how value and susceptibility can be combined to assess sensitivity using professional judgment. When determining overall landscape sensitivity, it should be noted that the levels of landscape sensitivity are indicative and fall on a scale from high to negligible.

2.8.A.10.3. Any landscape receptors assigned a negligible level of sensitivity would not be further considered as part of the assessment on the basis that potential significant effects are highly unlikely, as demonstrated in **Plate 2.8.A-2**.

Plate 2.8.A-2: Level of Landscape Sensitivity Diagram

Level of Landscape Sensitivity Diagram



2.8.A.11. Magnitude of change

2.8.A.11.1. The magnitude of landscape impact refers to the extent to which the Proposed Scheme would alter the existing characteristics of the landscape. It is an expression of the size or scale of change to the landscape, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The size, scale and nature of change in relation to the context;
- The geographical extent of the area influenced; and
- Its duration and reversibility.

2.8.A.12. Size/Scale of Change

2.8.A.12.1. The size/scale of change to the landscape receptors that would arise because of the English Onshore Scheme would take into account the following changes:

- the extent of existing landscape elements that would be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- the degree to which aesthetic or perceptual aspects of the landscape are altered either by the removal of existing components of the landscape or by the addition of new components and;
- whether the changes would alter key characteristics of the landscape, which are critical to its distinctive character.

2.8.A.12.2. **Table 2.8.A.5** below lists the four levels of size and scale alongside typical characteristics:

Table 2.8.A.5 Size/Scale

Size/Scale	Typical characteristic
Large	Large scale loss of vegetation and other valuable landscape elements that contribute to the distinctive landscape character. The change would result in prominent alterations to the perceptual and aesthetic qualities of the landscape through the removal of valuable and the addition of uncharacteristic elements. The change is of such a scale and size that it would likely alter key characteristics of the local landscape or landscape character units at the local or regional scale.
Medium	Medium scale loss of vegetation and other valuable landscape elements contributing to some extent into the distinctive landscape character. The change would result in notable alteration to the perceptual and aesthetic qualities of the landscape through the removal of some valuable elements and the introduction of elements not fully consistent with the receiving landscape. The change is of such a scale and size that it would not alter the key characteristics of the local landscape or landscape character units at the local or regional scale.
Small	Vegetation and other valuable landscape elements would be lost to a limited extent, and the loss would affect predominantly commonplace elements, which contribute to the distinctiveness of landscape character to a limited extent. The change through the removal of some valuable elements and the introduction of elements not entirely consistent with the receiving landscape resulting in restricted change to the perceptual and aesthetic qualities.
Very small	The loss of valuable elements would be very small, with commonplace landscape elements lost to a limited extent. There would be a slight change to the perceptual and aesthetic qualities of the landscape through the removal and addition of landscape elements. The change would have very little impact on the key characteristics of the local landscape or landscape character units at the local or regional scale.

2.8.A.13. Geographical Extent

2.8.A.13.1. The geographical extent is the area over which changes in landscape occur. It is not the same as size/scale, as a small scale change may cover a larger area or vice versa. The extent of geographical change may vary from high to low, with typical descriptions provided in **Table 2.8.A.6** below.

Table 2.8.A.6 Geographical extent

Geographical extent	Typical characteristic
Large	The change would have a widespread physical extent and influence on the perception of the landscape. It would affect a large area, a large proportion of landscape character units, or several landscape character units.
Medium	The change would affect a medium extent of the area or landscape character unit and would have a notable impact on physical attributes alongside perceptual and cultural qualities of the landscape.
Small	The change would be perceived locally, with limited effect on wider landscape character.
Very small	The change would be confined within the local area with very limited effect on the wider landscape character.

2.8.A.14. Duration and Reversibility

2.8.A.14.1. Duration and reversibility are particularly important when considering the different stages of the English Onshore Scheme. As stated in GLVIA3 (paragraph 5.51) (Ref 2.8.A.1) "*duration can usually be simply judged on a scale such as short term, medium term or long term*" and is defined in **Table 2.8.A.7.**

2.8.A.14.2. Reversibility (paragraph 5.52 of GLVIA 3) "*is a judgement about the prospects and the practicality of a particular effect being reversed in, for example a generation*." Underground pipelines can be considered reversible in landscape and visual terms because most of the infrastructure is below ground and, therefore, not perceived within the landscape once construction is completed, and its effects largely reversed following the construction stage. Some elements of the English Onshore Scheme would be long-term, such as the converter stations and Walpole B Substation. The criteria for assessing duration and identified levels are included in **Table 2.8.A.7.**

Table 2.8.A.7 Duration of change

Duration of change	Criteria
Long term	Ten years +
Medium term	2 to 10 years
Short term	1-2 years
Brief	<1 year

2.8.A.15. Magnitude of change

2.8.A.15.1. Like with sensitivity, combining the scale, geographical extent, and duration/reversibility of the change together requires careful consideration and professional judgement. As such, the LVIA would consider each aspect separately to form the overall magnitude judgement. **Table 2.8.A.8** below, illustrates four levels of magnitude assessment identified through a combination of size/scale, geographical extent, duration and reversibility.

Table 2.8.A.8 Magnitude of change

Geographical extent	Typical characteristic
High	A large-scale change that may include the loss of key landscape elements/characteristics or the addition of uncharacteristic new features or elements that would alter the perceptual characteristics of the landscape. The size or scale of landscape change could create new landscape characteristics and may change the overall distinctive landscape quality and character, typically, but not always affecting a larger geographical extent.
Medium	A medium-scale change that may include the loss of some key landscape characteristics or elements, or the addition of some uncharacteristic new features or elements that could alter the perceptual characteristics of the landscape. The size or scale of landscape change could create new landscape characteristics and may lead to a partial change in landscape character, typically, but not always affecting a more localised geographical extent.
Low	A small-scale change that may include the loss of some landscape characteristics or elements of limited characterising influence, or the addition of some new features or elements of limited characterising influence. There would be a small and partial change in landscape character, typically, but not always affecting a localised geographical extent.
Negligible	A very small-scale change that may include the loss or addition of some landscape elements of limited characterising influence. The landscape characteristics and character would be unaffected.

2.8.A.16. Significance of effects

2.8.A.16.1. Combining the stated measures of magnitude and sensitivity indicates the relative importance of different effects. This, combined with an oversight of professional judgement, allows us to evaluate effects and to determine the significance. provides general guidance on the interrelationship between magnitude of change and receptor sensitivity. However, this matrix is used as a framework and guide for consistency, not as a prescriptive formula: the level of effect and thus significance would vary depending on the circumstances, the type and scale of development proposed, the baseline context, and other factors as set out in the previous sections. **Table 2.8.A.9** gives typical descriptors of the levels of landscape and visual effects.

Table 2.8.A.9 Significance Matrix

Significance matrix					
		Magnitude			
		High	Medium	Low	Negligible
Sensitivity	High	**Major (Significant)**	**Major (Significant)**	Moderate (potentially significant)	Minor (Not significant)
	Medium	**Major (Significant)**	Moderate (potentially significant)	Minor (Not significant)	Minor (Not significant)
	Low	Moderate (potentially significant)	Minor (Not significant)	Minor (Not significant)	Negligible (Not significant)
	Negligible	Minor (Not significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)

2.8.A.16.2. As set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**, using professional judgement and with reference to the Guidelines for Environmental Impact Assessment (IEMA 2004) (Ref 2.8.A.8), the assessments within **Volume 1, Part 1, Chapter 8: Landscape and Visual** consider the major adverse effects as always significant and moderate adverse being significant or not significant (as shown in bold in **Table 2.8.A.9**) while those less than moderate are always non-significant.

2.8.A.16.3. Determination of the significance level of landscape effects as outlined in **Table 2.8.A.10** has been undertaken by employing professional judgement and experience to combine and analyse the identified classification of the landscape magnitude of impact with the identified sensitivity of the receptor. The assessment takes account of direct and indirect changes in existing landscape elements, features and key characteristics. It evaluates the extent to which these would be lost or modified in the context of their importance in determining the existing baseline character.

Table 2.8.A.10 Significance of landscape effects

Significance levels	
Major	The English Onshore Scheme would result in major changes to landscape character, which would be considered significant or not significant.
Moderate	The English Onshore Scheme would result in moderate changes to landscape character, which would be considered significant.
Minor	The English Onshore Scheme would result in minor changes and these would be considered not significant.
Negligible	The English Onshore Scheme would result in negligible changes to landscape character and these would be considered not significant.

2.8.A.17. Visual Assessment Methodology

Visual Receptors

2.8.A.17.1. Visual effects relate to changes in available views of the landscape and the effect of those changes on people, including:

- *The immediate impact of the project on the content and character of views (E.g., through intrusion or obstruction and / or the change or loss of existing elements in the view); and*
- *The broader impact considering the overall change on visual amenity enjoyed by receptors in the area.*

2.8.A.17.2. GLVIA3 (Ref 2.8.A.1) advises that it is helpful to consider (but not restricted to) the following:

- *Nature of the view (open, panoramic, framed, enclosed);*
- *Proportion of the development visible (full, most, part or none);*
- *Distance of the viewpoint from the development and whether it would be the focus of the view or only a small element;*
- *Whether the view is stationary, transient or sequential; and*
- *The nature of the changes to the view.*

2.8.A.17.3. Additionally, the seasonal effects of vegetation are considered, in particular the varying degree of screening and filtering of views.

2.8.A.18. Visual Sensitivity

2.8.A.18.1. The sensitivity of a visual receptor reflects their susceptibility to change and any values which may be associated with the specific view. The sensitivity of the visual receptors is arrived at by separately considering the visual receptor value and the susceptibility of the visual receptor to the proposed change.

2.8.A.19. Visual Value

2.8.A.19.1. Certain views are highly valued for either their cultural or historical associations, which can increase the sensitivity of the viewer, as set out in **Table 2.8.A.11**.

Table 2.8.A.11 Visual value

Value	Recognition	Indicators of value
High	Recognised views from nationally or internationally important landscape or heritage resources may be identified in planning policies or statutory documents.	High value / celebrated view; referred to in national or international guidebooks, tourist guides etc.; literary and art references; presence of interpretive facilities (E.g., visitor centre).
Medium	Recognised views from local or regionally important landscape or heritage resource may be identified in local planning policies or supplementary planning documents.	Moderately valued view; referred to in local or regional guidebooks, tourist maps etc.; local literary and art references; presence of some interpretive facilities (E.g., parking places or sign boards).
Low	Locally recognised views, usually informal.	Valued view but no formal references, may include informal footpaths that indicate well used routes by locals. Likely to be common where views are typical of the location with little distinctiveness, lacking in attractors or detractors.
Negligible	Little to no recognition	Not known locally for its views, places that lack evidence of people actively seeking use and therefore any associated views.

2.8.A.20. Visual susceptibility

The susceptibility of a visual receptor to the English Onshore Scheme is defined as the ability of the receptor to accommodate the specific proposed development without undue adverse consequences. Visual susceptibility criteria are outlined in **Table 2.8.A.12** below.

Table 2.8.A.12 Visual susceptibility

Visual Susceptibility to Proposed Change	
High	• Residents at home; • Walkers on long distance trails and mountain access routes, • Users of footpaths where the attractive nature of the countryside is a significant factor in the enjoyment of the walk,

Visual Susceptibility to Proposed Change	
	• Cyclists on national and local cycle routes designed to provide an attractive experience; • Road users on recognised tourist routes; and • Visitors to landscape and heritage resources and other attractions where views of the surroundings are an important contributor to appreciation, experience and/or enjoyment.
Medium	• General road users; • Passengers on rail lines where the trains run at low or moderate speeds; • Users of public open space and footpaths where the nature of the surroundings is not a significant factor in the enjoyment of the activity; and • Visitors to landscape and heritage resources and other attractions where views of the surroundings are a minor contributor to appreciation, experience and/or enjoyment.
Low	• People at their place of work or shopping; • Users of high-speed roads and passengers in trains running at high speed; • People engaged in recreational activities where the view of the surroundings is secondary to the enjoyment of the activity (such as playing or spectating at outdoor sports facilities); and • Users of public open space and footpaths where the nature of the surroundings is irrelevant to the enjoyment of the activity.
Negligible	• Users of indoor facilities where the view is irrelevant to their activity.

2.8.A.20.1. As with landscape, susceptibility and value can be combined in different ways to form a judgement about the visual sensitivity of a given receptor. It is generally accepted that a combination of high susceptibility and high value is likely to result in the highest sensitivity, whereas a low susceptibility and low value is likely to result in the lowest level of sensitivity.

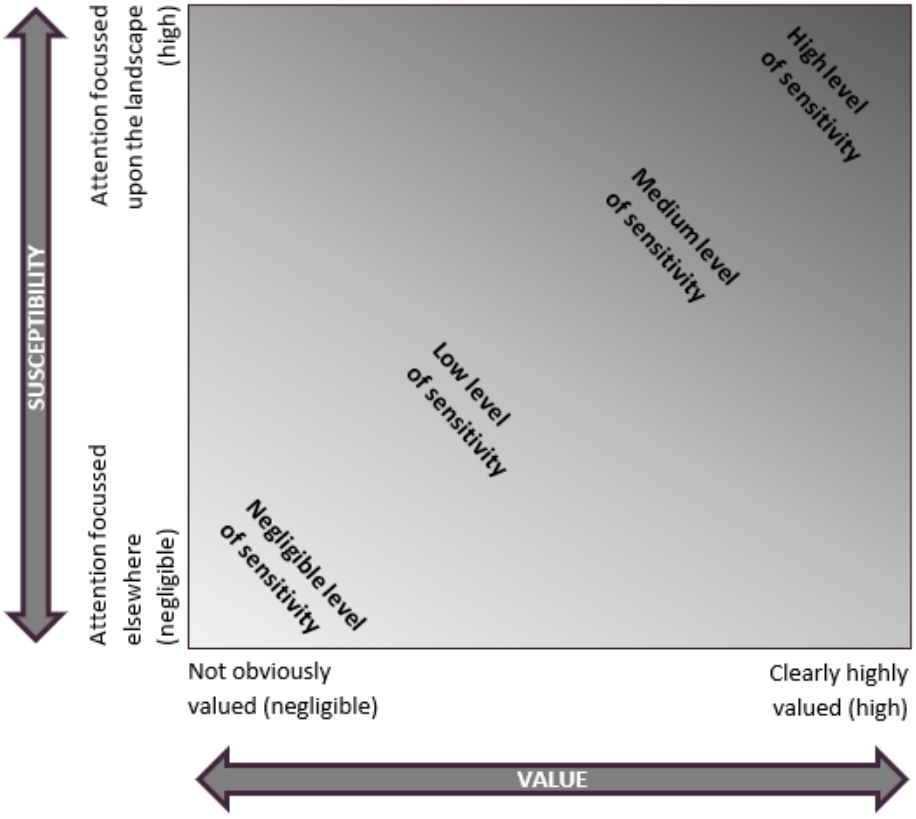
2.8.A.20.2. However, whilst a valued view may serve to increase the overall sensitivity of the visual receptor, a low value would not necessarily reduce overall sensitivity. Whilst it would be anticipated that visual receptors considered highly susceptible to the proposed change would be considered to be of high sensitivity, this wouldn't be the case if there were reasons associated with the value of the view that lead to a reduction in sensitivity. For example, a resident at home would generally have a high sensitivity to the proposed change, but if the view they currently experience is of a low value degraded and industrial landscape it can be expected that their susceptibility to a proposed change of a similar industrial nature would be reduced.

2.8.A.20.3. Similarly, receptors considered of low or medium susceptibility are usually in the same category of sensitivity, unless there are reasons associated with the value of the view that lead to an increase in sensitivity, which is shown in **Plate 2.8.A-3**. For

example, where a road user on a defined tourist route would have a higher susceptibility to the proposed change than if travelling on a busy main road.

2.8.A.20.4. **Plate 2.8.A-3** illustrates typical characteristics of the different sensitivity levels, taking into account the value and susceptibility described above. When determining overall visual sensitivity, it should be noted that the levels are indicative and fall on a scale from high to negligible and professional judgement is always used to determine the overall level of sensitivity.

Plate 2.8.A-3: Level of visual sensitivity diagram



2.8.A.21. Assessing the visual magnitude of change

2.8.A.21.1. The magnitude of visual change depends upon a combination of factors including:

- The size, scale and nature of change in relation to the context;
- The geographical extent of the area influenced; and
- Its duration and reversibility.

2.8.A.22. Size/Scale of change

2.8.A.22.1. The size/scale of change to the landscape and to visual receptors that would arise because of the English Onshore Scheme would take account of the following factors as set out below:

- The scale of change in the view (addition or loss of features) and changes to its composition and depth of view;

- The degree of contrast or integration of new features or characteristics into the landscape considering form, scale, mass, height, colour and texture; and
- The nature of the view of the project, the time over which it would be experienced and changes in the experience from for instance full, partial, glimpsed to screened.

2.8.A.22.2. The typical descriptions of size/scale are listed in **Table 2.8.A.13** Size/scale of visual change below.

Table 2.8.A.13 Size/Scale of visual change

Size/scale of change	
High	• Occupies a wide proportion of the view or would obstruct a significant portion of the view; • The project would become the dominant feature; and • Considerable change to the majority / many existing landscape elements and/or landscape character; fundamental changes to the surroundings and baseline to a large extent; very noticeable.
Medium	• Occupies much of the view but would not fundamentally change its characteristics; • Changes would be immediately visible but not a key feature of the view; and • Some change to existing landscape elements and /or landscape character; discernible changes to the surroundings of a receptor, such that its baseline is partly altered; readily noticeable.
Low	• Occupies a small portion of the view and would only slightly alter the view's composition; and • Small change to existing landscape elements and/or landscape character; slight, but detectable impacts that do not alter the baseline of the receptor materially; not readily noticeable.
Negligible	• Occupies little or no portion of the view and would not result in a change to the view's composition; and • Little or limited /no change in existing landscape elements and/or landscape character, barely distinguishable change from baseline conditions; not noticeable.

2.8.A.22.3. Geographical extent criteria are included below in **Table 2.8.A.14**. They refer to the angle of the view and the distance from the English Onshore Scheme, as well as the extent of any potential change in the view. For visual receptors moving through the landscape (e.g., road and rail users) the length of the journey during which they would see the English Onshore Scheme is reflected in the judgement of the geographical extent of effects.

Table 2.8.A.14 Geographical extent of change

Geographical Extent of Change	
High	The change in the view would affect an extensive portion of the view, affecting a large number of receptors, and would have a high influence on the perception of the landscape or view.
Medium	The change in the view would affect a moderate portion of the view, affecting a moderate number of receptors and would have moderate influence on the perception of the landscape or view.
Low	The change in the view would affect a small proportion of the views. e.g., the change would influence the immediate setting of the site. The development would be perceived locally, with a minor effect on wider views.
Negligible	The change in the view would affect a very small proportion of the views. The development would be perceived only locally, with a limited effect on wider landscape character or views.

2.8.A.23. Duration and Reversibility

2.8.A.23.1. Duration and reversibility are particularly important when considering the different stages of the English Onshore Scheme. As stated in GLVIA3 (paragraph 5.51, Ref 2.8.A.1) "*duration can usually be simply judged on a scale such as short term, medium term or long term*" and is defined in **Table 2.8.A.15**.

2.8.A.23.2. Reversibility (paragraph 5.52 of GLVIA 3) "*is a judgement about the prospects and the practicality of a particular effect being reversed in, for example a generation*." Some forms of development are considered permanent such as housing developments, whilst others such as solar farms can be considered temporary or reversible since they have a limited operational life and can be removed and land reinstated.

Table 2.8.A.15 Duration of change

Duration of change	
High	Long term / 10 years +
Medium	Medium term / 2 to 10 years
Low	Short term / 1-2 years
Negligible	Brief term / <1 year

2.8.A.24. Magnitude of change

2.8.A.24.1. Like with sensitivity, combining the scale, geographical extent, and duration/reversibility of the change together requires careful consideration and professional judgment. As such, the LVIA would separately consider each aspect to form the judgement of overall magnitude.

2.8.A.24.2. Combining the stated measures of magnitude and sensitivity indicates the relative significance of different effects. This, combined with an oversight of professional judgement, allows us to evaluate effects and to determine significance their significance.

2.8.A.24.3. **Table 2.8.A.16** below provides general guidance on the inter-relationship between magnitude of change and sensitivity of receptor. However, this matrix is used as a framework and guide for consistency, not as a prescriptive formula: the level of effect and thus significance would vary depending on the circumstances, the type and scale of development proposed, the baseline context and other factors as set out in the previous sections.

Table 2.8.A.16 Significance Evaluation Matrix

		Magnitude of change			
		High	**Medium**	**Low**	**Negligible**
Sensitivity or value	**High**	**Major (significant)**	**Major (significant)**	Moderate (potentially significant)	Minor (not significant)
	Medium	**Major (significant)**	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)
	Low	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)	Negligible (not significant)
	Negligible	Minor (not significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)

2.8.A.24.4. As set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**, using professional judgement and with reference to the Guidelines for Environmental Impact Assessment (IEMA 2004) (Ref 2.8.A.8), the assessments

within **Volume 1, Part 1, Chapter 8: Landscape and Visual** consider the effects of moderate and greater levels of effect to be significant as shown in **Table 2.8.A.16** those less than moderate to be non-significant.

2.8.A.24.5. For the purposes of proportionality and to ensure that potential significant effects are the key focus of this assessment, any landscape or visual receptors assigned a negligible level of sensitivity would not be further considered as part of the assessment on the basis that significant effects are highly unlikely.

2.8.A.25. Visual level of effect

2.8.A.25.1. Through the steps carried out above, the resulting visual level of effect is arrived at. **Table 2.8.A.17** below presents the scale for visual effects and can be summarised in the following descriptions.

Table 2.8.A.17 Visual level of Effect

Visual level of effect	
Major	The English Onshore Scheme would result in major changes to visual receptors and these would be considered significant.
Moderate	The English Onshore Scheme would result in moderate changes to visual receptors and these would be considered significant or not significant
Minor	The English Onshore Scheme would result in minor changes to visual receptors and these would be considered non-significant.
Negligible	The English Onshore Scheme would result in negligible changes to visual receptors and these would be considered non-significant.

2.8.A.26. Nature of effect

2.8.A.26.1. Effects can be either beneficial or adverse and, in some cases, neutral (neither beneficial nor adverse).

2.8.A.26.2. The nature of effect of infrastructure on landscape character and visual amenity is very subjective, with a broad spectrum of opinion on the appearance of infrastructure in the landscape. Some people see infrastructure as sculptural features positively addressing the effects of climate change, whilst others regard them as alien and an industrialisation of the countryside.

2.8.A.26.3. The aim of the LVIA is to provide an objective assessment of the relationship between the English Onshore Scheme and the landscape in which it would be located and seen. As part of this it is also important to consider the nature of the proposed change in the context of the key characteristics of the landscape. As large, engineered structures are being added to the landscape, it is unlikely that a beneficial nature of effect would be found, but neutral effects could occur where it is considered the English Onshore Scheme does not change the defining characteristics of the landscape.

2.8.A.26.4. For the purposes of this LVIA, and to ensure this LVIA assesses the reasonable worst-case scenario, the nature of all effects would be considered as adverse, unless otherwise identified through mitigation.

2.8.A.26.5. Other aspects of the English Onshore Scheme may have opportunities for beneficial landscape and visual effects, for example, where improvements are made to access and public rights of way or mitigation planting increasing biodiversity.

2.8.A.27. Assessment scenarios

2.8.A.27.1. The effects of the English Onshore Scheme on receptors vary over time due to daily changes in light level, seasonal variation and over the longer term the maturing of essential mitigation planting. The following scenarios are assessed:

- Construction stage.
- Winter (Year 1).
- Summer (Year 15).

2.8.A.28. Assessment of cumulative effects

Approach

2.8.A.28.1. GLVIA3 (Ref 2.8.A.1) provides the basis for the cumulative assessment methodology. The assessment of cumulative effects is essentially the same as for the assessment of the stand-alone landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the combination of sensitivity of the landscape or visual receptor and the magnitude of change.

2.8.A.28.2. A review of applications of a similar size and scale has been carried out to determine which applications within the planning system are included for assessment. These are be referred to as Cumulative Developments.

2.8.A.28.3. Receptors judged to receive a negligible level of effect from the English Onshore Scheme on its own are not considered for cumulative assessment on the basis that any potential significant effects arising would primarily be caused by the Cumulative Developments and unlikely to be contributed by the English Onshore Scheme.

2.8.A.28.4. Types of cumulative effect are defined as follows:

- Cumulative landscape effects: Where more than one development may have an effect on a landscape designation or particular area of landscape character. This may also include effects on the physical fabric of the landscape where one or more developments may affect landscape components; and
- Cumulative visual effects: Where the cumulative or incremental visibility of similar types of development combined generate a cumulative visual effect.

2.8.A.28.5. The study area and receptors remain as per the English Onshore Scheme.

2.8.A.28.6. The methodology for the assessment of sensitivity remains the same as per the assessment for the English Onshore Scheme. The cumulative landscape and visual magnitude of change are determined with reference to the criteria set out above for the main assessment and the following considerations:

- The distance and direction to each visible or potentially visible Cumulative Development;
- The number of visible or potentially visible Cumulative Developments;
- The distance between Cumulative Developments and the English Onshore Scheme;
- The height of features at each Cumulative Development;
- The horizontal extent of the view occupied by Cumulative Developments;
- The vertical scale comparison of Cumulative Developments; and
- Duration of the change of Cumulative Developments.

2.8.A.28.7. Determination of the significance of cumulative landscape and visual effects is undertaken by employing professional judgement to combine and analyse the cumulative magnitude of change against the identified sensitivity to change. It should be noted that the cumulative assessment is the result of the addition of the English Onshore Scheme to the identified cumulative baseline scenario.

2.8.A.28.8. The methodology for assessing cumulative effects is presented in **Volume 1, Part 4, Chapter 28: Cumulative Effects Assessment.** A detailed cumulative effects assessment will be reported in the Environmental Statement. .

2.8.A.29. Visual representations

2.8.A.29.1. The methodology for undertaking ZTVs and preparing visual representations is compliant with relevant sections of:

- Visual Representation of Development Proposals, Technical Guidance Note 06/19', Landscape Institute (LI), 2019 (Ref 2.8.A.3); and
- Guidelines for Landscape and Visual Impact Assessment' Third Edition, Landscape Institute and the Institute of Environmental Assessment, 2013 (GLVIA3) (Ref 2.8.A.1).

2.8.A.29.2. The LI guidance provides detail on maintaining a proportionate approach to visualisations, providing advice on selecting visualisation types taking into account the intended purpose, anticipated users, planning stage, sensitivity of the context, and indicative overall level of effect. This is helpful in consideration of responding to stakeholder and public requests where it may not always be appropriate to produce the full suite of visualisations.

2.8.A.30. Zone of Theoretical Visibility

2.8.A.30.1. ZTVs are used to identify the theoretical visibility of a Projects. It is a computer-generated analysis which evaluates visibility using the height and extent of a Projects against a digital terrain model.

2.8.A.30.2. For the purposes of the PEIR, a series of ZTVs have been produced for the English Onshore Scheme components at Walpole (siting Options A-D as described in Chapter 8). These combine the indicative zones for converter stations, the indicative Walpole B substation location (including the indicative Cable Sealing End Compound) and works to the existing 400 kV overhead line.

2.8.A.30.3. The ZTVs are presented in **Volume 3, Part 2, Figure 8-4, Options A-D, Zones of Theoretical Visibility (ZTV), excluding works to the existing 400 kV overhead line** and **Volume 3, Part 2, Figure 8-5, Options A-D, Zones of Theoretical Visibility (ZTV), including works to the existing 400 kV overhead line.**

2.8.A.30.4. The ZTVs have been generated as follows:

- Viewshed analysis was created in ESRI ArcGIS Pro software, using a standard methodology with the Geodesic Viewshed Tool;
- Each ZTV has been created using a base raster height data of 2m Photogrammetric DSM 2m dataset with a +/- 1m XY RMSE and a +/- 1.5m Z RMSE;
- Observer points were generated at a point spacing of 50m around all indicative zones for converter stations, the indicative Walpole B substation location and works to the existing 400 kV overhead line, in order to calculate overall visibility, with base heights calculated from the EA 1m LiDAR DTM.
- The heights of the observer points for each component observe Rochdale envelope dimensions as described in Chapter 8
- The ZTVs are based on theoretical visibility from 1.6 m above ground level; and
- The output Viewshed is a raster dataset with a cell size of 2m as per the input dataset.

2.8.A.30.5. Limitations with the preparation of ZTVs include the following:

- The ZTV does not indicate the decrease in visibility that occurs with increased distance from the Projects. The nature of what is visible from 1 km away would be markedly different from what is visible from 5 km away.

2.8.A.30.6. These limitations mean that while the ZTVs have been used as a starting point in the assessment to determine where the Projects would be theoretically visible from, such information needs to be verified in the field to ensure that the assessment conclusions are accurate.

2.8.A.31. Visualisations

2.8.A.31.1. The photomontage visualisations would be produced at the ES stage following an agreement with stakeholders. Proposals. At this stage, a range of annotated photo-panoramas (to TGN 06/19 Type 1) or photomontages (to TGN 06/19 Type 3) (Ref 2.8.A.3) for six viewpoints would be produced.

2.8.A.32. Photography for baseline images

2.8.A.32.1. The viewpoint photography for the ES is intended to be captured by the following method:

- A 50 mm fixed lens on a DSLR camera with a full frame sensor;
- Tripod with a panoramic head;
- Camera positioned at 1.6 m height at the centre of the lens although the camera height may have been different if features such as fences, or hedges obscured the view;

- Minimum of 50% overlap on panoramic photographs to minimise distortion when stitching the photographs;
- Portrait orientation photographs taken for viewpoints close to the Project to ensure full vertical extent of the Project is seen;
- At least a 180-degree panorama taken (where the viewpoint allows); and
- Grid reference recorded at each viewpoint location.

2.8.A.33. Photography for photomontages

2.8.A.33.1. The photographs are captured by the following method:

- Where possible, the Projects would be positioned in the middle of the panorama. Photographs were taken in suitable weather conditions and ideally in clear visibility;
- The views would be photographed with a digital SLR camera with a full frame sensor and fixed 50 mm lens. A Canon 6D Mark III (or equivalent) would be used;
- The camera would be mounted in portrait format on a tripod with a panoramic head and levelling base attached. The lens centre (its nodal point) would be set at an eye level of approximately 1.6 m although the camera height may have been different if features such as fences, or hedges obscured the view;
- The Camera's location would be recorded using a X, Y, Z co-ordinate from a surveying total station (accuracy of <10 mm) with offset to account for the lens. Camera setup levelled in the horizontal and vertical planes using levelling plate and levelling centre column;
- Camera set to manual focus; ISO100-400 with an aperture set to record an adequate depth of field (F8-F11) and white balance set appropriately to conditions;
- The camera would be rotated between 15-20° to allow for a 50% overlap between each photograph;
- Images would be captured in High Resolution JPEG format which includes lens distortion correction; and
- The photography and surveying would be undertaken simultaneously in order to avoid problems with markers in soft ground moving or being removed altogether.

2.8.A.34. Verifiable surveying

2.8.A.34.1. The following techniques are used to verify the photomontages:

- A Leica Total Station is used by the surveyor to accurately record the camera position and also capture an array of selected survey reference points within the frame of the photographs, which are used to camera match and calibrate the photography. All survey points are captured in the British National Grid (BNG) co-ordinate system, recording an X, Y and Z co-ordinate for each;

- Each camera location is surveyed together with a series of clearly defined detail points within the image (E.g., corners of road markings, features on road signs, corners of building features etc). Where a viewpoint does not contain many or any fixed targets suitable for surveying, temporary targets are set up to allow the survey to be completed at the same time as the photography;
- Each image ensures a sufficient amount of clearly defined detail points are taken across the width of the image and at near, mid and far distance (i.e. a balance of points across the photograph). Where possible these numbered between 8-12 points. Each detail point is given a unique number that related to the viewpoint number;
- The survey data is post-processed by the chartered surveyor to increase accuracy and then supplied in an Excel table for each set of viewpoint photography; and
- A CAD file is provided containing the detail points and camera positions.

2.8.A.35. Model Assembly

2.8.A.35.1. The following methods are used to assemble the 3D model:

- Surveyed X, Y, Z co-ordinates of reference points and the camera position are set up in 3D Studio Max;
- The 3D computer model of the Project;
- The 3D computer model is georeferenced using supplied drawing data;
- Within the 3D software a virtual camera is set up using the co-ordinates provided by the verified survey surveyor and aligned with the reference markers;
- A lighting environment is set up within the 3D software, using the metadata stored in the image and also surveyor location data;
- A 3DS Max model file for each viewpoint is assembled before rendering. The assembled model contains the relevant Project digital terrain model tiles and any structures, buildings or further elements (as defined above) that can be seen in the viewpoint.

2.8.A.36. Camera matching

2.8.A.36.1. The following describes the process of ‘camera matching’ to create a virtual camera:

- The process of camera matching creates a virtual camera in the same location and height and pointing in the same direction as the physical camera used on site to capture the image;
- Each viewpoint has its survey points in place and the camera is set to the required field of view and view direction (generally, between 75-90°)’
- The process involves accurately positioning the 3D model of the Proposed Development within each existing view. This is achieved through a process of matching the surveyed points in the digitised image with those recorded by the survey team on the verifiable photographs;

- The survey points and specifications of the lens type relating to each view are also entered into 3DS Max;
- The survey points of the camera position and each clearly defined detail point (relating to specified objects in the view) are then highlighted on the digitised image;
- Once the process of camera matching is complete, the 3D model of the Project is accurately positioned within each of the views captured. This is achieved by rendering the camera matched 3D model of the Project within 3DS Max at the same size as the digitised existing view. The position is then checked and verified by the project Landscape Architect.
- To aid in greater accuracy of real-life camera settings and the production of cylindrical projection, wide angle panoramas which match the photography stitch, a plug-in programme called V-Ray are used. Each of the views are rendered using the V-Ray Rendering Engine software;
- Individual elements are rendered out using different map channels to create masks (for example mask for the digital terrain model, earthworks, fencing, shadows etc). These masks ensured each visible element of the Proposed Development could be independently selected when individually placed into the Adobe Photoshop file for final production.

2.8.A.37. Producing the photomontage

2.8.A.37.1. The following describes the process of producing photomontage**:**

- The JPEGs of the verified photography are stitched into a panorama using PTGui software which provides an accurate planar or projection panorama as required. The resulting panorama is cropped to the required horizontal field of view and image size;
- At this stage panoramas are checked for acceptability by the Projects landscape architect;
- The renders of the 3D model are superimposed onto the baseline panorama in Photoshop. The foreground of the existing photos visible in front of the Projects are then carefully copied and masked to ensure the render of the 3D model sit accurately within the depth of the view. The compositing process involved digitally removing existing features such as trees that were within the extents of the Projects;
- The textured render of the 3D model is then further adjusted to match the resolution, colouring and saturation of the photograph captured to create an accurate impression of what the textured elements of the Proposed Development would look like;
- Soft landscaping is added in Photoshop to as accurately as possibly reflect how the Proposed Development would look during operation in the opening year and year 15, taking into account growth rates of any planting.

2.8.A.38. Photomontage presentation layouts

2.8.A.38.1. The following describes how each photomontage is presented:

- The standard Layout is A1 Landscape with a horizontal field of view of 90° with an image size of 820 x 250 mm minimum (height as appropriate).
- Each view is annotated with specific camera and viewpoint information as required in TGN-06-19 Appendix 10 (Ref 2.8.A.3).
- When printing there should be no scaling or fit to page options selected as this would alter the size of the image. A high-quality print setting with a minimum resolution of 300 dpi should be used.

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