

**APPENDIX 7.1**

**LANDSCAPE AND VISUAL IMPACT ASSESSMENT METHODOLOGY**

## APPENDIX 7.1: LVIA Methodology

### Introduction

- 7.1 The methodology employed in carrying out the landscape and visual impact assessment of the Development from the Ebberston Moor South (EMS) Well Site to the Knapton Generating Station (KGS) has been drawn from best practice guidelines and the Landscape Institute and the Institute of Environmental Management & Assessment's 'Guidelines for Landscape and Visual Impact Assessment' 3<sup>rd</sup> Edition (2013). The aim of these guidelines is to set high standards for the scope and content of landscape and visual impact assessments and to establish certain principles that will help to achieve consistency, credibility, transparency and effectiveness in landscape and visual impact assessment.
- 7.2 Landscape and visual impact assessments often differ from other specialist studies because they are generally undertaken by professionals who are also involved in the design of the landscape and the preparation of subsequent management proposals. This can allow the assessment to proceed as an integral part of the overall scheme design rather than as a discrete study carried out once the proposals have been finalised.
- 7.3 Landscape and visual impact assessment, in common with any assessment of environmental effects, includes a combination of objective and subjective judgements, and it is therefore important that a structured and consistent approach is used to ensure that it is as objective as possible. Judgement should always be based on training and experience, and be supported by clear evidence and reasoned argument. Accordingly, it is recommended that suitably qualified and experienced landscape professionals carry out landscape and visual impact assessments.
- 7.4 A typical landscape assessment includes the following illustrative material:
- Aerial Photograph;
  - Site Context Plan;
  - Landscape Character Plan;
  - Topographical Features Plan;
  - Site Appraisal Plan;
  - Visual Appraisal Plan;
  - Site Appraisal Photographs;
  - Site Context Photographs; and
  - Extracts from published Landscape Character Assessments.

### Landscape and Visual Effects

- 7.5 This methodology describes the process used in assessing the effect of the Development on the landscape features and visual amenity receptors surrounding the Site and the Site's

contribution to the existing landscape character and its resource.

- 7.6 Landscape and visual assessments are separate, albeit linked, procedures. The existing landscape and visual context all contribute to the existing 'baseline' for landscape and visual impact assessment studies. The assessment of the potential effect on the landscape is carried out as an effect on an environmental resource, i.e. the landscape features or character. Visual effects are assessed as one of the interrelated effects on people.
- 7.7 Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This may in turn affect the perceived value ascribed to the landscape.
- 7.8 Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.
- 7.9 The assessment of effects aims to:
- Identify systematically the likely effects of the Development;
  - Indicate the measures proposed to avoid, reduce, remedy or compensate for those effects, primarily as part of the iterative design process and then as more specific mitigation measures; and
  - Provide an assessment and professional judgement on the magnitude of the effects and the nature and significance of these effects in a logical and objective well-reasoned fashion.
- 7.10 Effects may be positive (beneficial), neutral, or negative (adverse), direct or indirect, and can be secondary or cumulative, permanent or temporary (short, medium or long term). They can also arise at different scales (local, regional or national) and have different levels of significance.

### **Baseline Studies**

- 7.11 The initial step in any landscape or visual impact assessment is to review the existing landscape and visual resource in the vicinity of the Development – that is the baseline landscape and visual conditions. The data collected forms the basis from which the magnitude and significance of the landscape and visual effects of the Development are identified and assessed. The purpose of baseline studies is to record and analyse the existing landscape features, character, condition and the value or importance of the landscape and visual resources in the vicinity of the Development.

## Desktop Study

- 7.12 The desktop study explores patterns and scale of landform, land cover and built development, which give guidance on the general landscape character of the surrounding area. Any special values that may apply, such as designated landscapes i.e. AONB, Green Belt, Conservation Areas, Listed Buildings, strategic viewing corridors, Tree Preservation Orders (TPOs) and Public Rights of Way (PRoW), in the vicinity of the Site are recorded. Notable components of the landscape, as well as residents, visitors, travellers and other groups of viewers are also identified.
- 7.13 Landscape character assessment, and particularly the stage of characterisation, is the basic tool for understanding the landscape and is the starting point for baseline surveys. There is a well established methodology developed in the UK by the Countryside Agency (now Natural England) and Scottish Natural Heritage. The baseline studies provide a concise description of the existing character of the Site and its surrounding landscape, and the classification of the landscape into distinct character areas or types, which share common features and characteristics. The condition of the landscape, i.e. the state of an individual area of landscape should be described as factually as possible, and a judgement should be made on the value or importance to society of the affected landscape. The assessment of landscape importance includes reference to policy or designations as an indicator of recognised value, including specific features or characteristics that justify the designation of the area. This information is needed as part of the baseline to establish why the landscape is considered to be of value at a national, regional or local level.
- 7.14 Principal viewpoints within the area surrounding the Site are also identified and accompanied with photography, depicting the relative visibility of the Site (and existing features or development on it) and its relationship with the surrounding landscape and built forms. The selection of viewpoints is based on the following criteria:
- The requirement to provide an even spread of representative viewpoints within the visual envelope, and around all sides of the Site;
  - The requirement to provide representative viewpoints that consider a human's normal field of vision (i.e. panoramic views);
  - From locations which represent a range of near, middle and long distance views;
  - Whilst private views are relevant, public viewpoints, i.e. from roads and PRoW and other areas of open public access, are selected since they are the most significant in terms of the number of receptors affected; and
  - Views from sensitive receptors within designated landscapes.
- 7.15 The study encompasses groups of properties, roads, PRoW and public open space that lie within the visual envelope or zone of visual influence of the Site. The term *properties* includes dwellings, public buildings, community facilities and places of employment. The

extent of visibility of the Site is based on a grading of degrees of visibility, from a visual inspection of the Site and surrounding area. There is, in any visual assessment, a continuity of degree of visibility ranging from no view of the Site to full open views. To indicate the degree of visibility of the Site from any location, including from roads, railway lines, PRoW, public open space and properties, three categories have been used:

- Truncated View:** truncated / curtailed / no view of the Site or it is difficult to perceive;  
**Partial View:** a view of part of the Site, or a filtered view of the Site or a distant view where the Site is perceived as a small part of the view; and  
**Open View:** a clear view of a significant proportion of the Site within the wider landscape.

#### Field Survey

- 7.16 The desk study provides a sound basis for subsequent field survey work including the identification of landscape character areas around the Site, the likely extent to which the Site is likely to be visible (that is the visual envelope or zone of visual influence) and principal viewpoints. The field survey identifies and records specific sensitive receptors. The term *receptor* is used in landscape and visual impact assessments to mean an element or assemblage of elements that would be directly or indirectly affected by the Development, including *landscape receptors* such as vegetation features and physical areas which provide a particular sense of landscape character, and *visual receptors* meaning particular groups of people who are likely to be affected.
- 7.17 The approximate visibility of the Site is determined through topographical analysis during the desktop study, with the actual extent of visibility checked in the field to identify and take account of the localised screening effect of buildings, walls, fences, trees, hedgerows and banks.
- 7.18 The final stage in the field survey identifies and addresses specific sensitive receptors including landscape elements and features that may be directly affected by the Development, as well as residents, visitors and other groups of viewers. In the case of landscape receptors, the field survey includes the recording of topographic, geological and drainage features, woodland, tree and hedgerow cover, land use, field boundaries and artefacts, access and PRoW. The findings are typically illustrated in a **Site Context Plan, Topographical Features Plan, Landscape Character Plan** and **Site Appraisal Plan**, and in a series of **Site Appraisal Photographs**. In the case of visual receptors, the types of views affected, an estimate of their numbers and whether there are few or many, duration of views, and potential seasonal screening effects are noted.
- 7.19 During the field survey, the extent to which the Site is visible from the surrounding area is confirmed, identifying the views into / towards the Site, identifying specific elements such as

landform, buildings or vegetation which interrupt, filter or otherwise influence views, and illustrating the findings on a **Visual Appraisal Plan**. The locations of principal viewpoints are mapped and these existing views are illustrated by annotated **Site Context Photographs**. The photographs are taken at eye level, with an overlap allowing panoramic photographs to be produced by splicing together individual photographs digitally, with minor retouching to eliminate variations in colour tone. The photographs are taken in accordance with the Landscape Institute Advice Note 01/11 'Photography and Photomontage in Landscape and Visual Impact Assessment' (2011).

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

- 7.20 Changes may arise from both built or engineered forms and soft landscape elements of the Development. The contribution of planting introduced as part of the Development are considered, with the height of this planting for assessment purposes considered as:

<b>Planting at Year 1:</b>	<i>Whips / transplants</i>	60-150cm
	<i>Larger stock</i>	3.5-4.5 metres
<b>Planting at Year 15:</b>		5 – 9.5 metres

- 7.21 Consideration is also given to the seasonal differences in effects arising from the degree of vegetative screening and/or filtering of views that would apply in summer and winter. Thus assessment may be provided for *average* and *worst-case* situations (the latter being the season with least leaf cover and therefore minimal vegetative screening).

#### Landscape Effects

- 7.22 Landscape effects include the direct and indirect effects of the Development on individual landscape elements and features, as well as the effect upon the general landscape character and quality of the surrounding area. Landscape effects are described clearly and objectively, and the extent and duration of any adverse/beneficial effects quantified, using five categories of effects. These categories indicate a gradation from high to low i.e. large, medium, small, very small and neutral. Some effects have been quantified, i.e. how many mature trees and how many metres of hedgerow are to be lost as a result of the Development, etc. and this type of factual data has the advantage of helping to put in context the degree of change that may occur.
- 7.23 Wider effects on landscape character and quality are more complex to predict and professional judgement is imperative to provide a fully reasoned objective judgement. A clear picture of likely effects is presented by referring back to the baseline landscape character assessment, and describing how the Development may alter existing patterns of landscape elements and features.

### *Sensitivity of the Landscape Resource*

- 7.24 The sensitivity of the landscape is reflected in the degree to which the landscape is able to accommodate a particular type of change without adverse effects on its character. This may be influenced by the extent of changes in topography and/or existing vegetation or new planting, condition of the landscape and the value attributed to it. These and other factors influence the extent of an effect on the perceived character of the surrounding landscape.
- 7.25 Determining the sensitivity of landscape character areas is aided through an understanding of published landscape character assessments. Based on this published information, an analysis of the sensitivity of landscape character within and adjacent to the Site is undertaken to enable an assessment of effects of the Development on landscape character.
- 7.26 Each landscape character area to be assessed is assigned a degree of sensitivity based on the character and quality of the existing landscape and its ability to accommodate the type of change proposed. The landscape sensitivity classifications are set out in Table 7.1.

**Table 7.1: Landscape Sensitivity Criteria**

<b>Sensitivity</b>	<b>Criteria</b>
High	Landscape of distinctive components and characteristics, susceptible to small alterations.
Medium	Landscape of relatively common components and characteristics, reasonably tolerant of changes.
Low	Landscape of relatively inconsequential components and characteristics, the nature of which is potentially tolerant of substantial alterations.

### *Magnitude of Landscape Effects*

- 7.27 The magnitude of landscape effects is determined through a combination of the scale of the Development, the type of Development and the level of integration of new features with existing elements. The magnitude of landscape effect classifications are set out in Table 7.2.

**Table 7.2: Magnitude of Landscape Effects Criteria**

<b>Magnitude</b>	<b>Criteria</b>
Large	Ranging from a limited change in landscape characteristics over an extensive area, to an intensive change over a more limited area.
Medium	A noticeable change in a localised area.
Small	A slight change in a localised area.
Very Small	A virtually imperceptible change to any component.
Neutral	No change discernible to any component.

### Visual Effects

- 7.28 The assessment of visual effects describes:
- Changes in the composition of the available views as a result of the Development; and
  - Changes in the visual amenity of visual receptors.

7.29 The visual effects of a Development on a view depends upon a number of factors, including:

- The nature of the Development;
- The siting of the Development in the landscape;
- The scale of the Development;
- The detailed design of the Development;
- The position and distance from which the Development is viewed; and
- The nature of the visual receptor.

7.30 A visual assessment study involves systematically identifying the visual receptors that are likely to be affected by the Development within the visual envelope. The method seeks to assess the impact of the Development in terms of the degree of change in the view experienced by the observer. The results are presented in a systematic form allowing an informed judgement to be made as to the impact of the Development. In the assessment of views there is likely to be a continuum in the degree of visibility of the Development from Open View to No View, and in order to assist in the description and comparison of the effect on views, simplified categories are used which consider:

- The extent of the view that would be occupied by the Development (degree of visual intrusion i.e. full, partial, glimpse, none);
- The proportion of the Development or particular features that would be visible (full, most, partial, limited, none);
- The distance of the viewpoint from the Development and whether viewers at the viewpoint would focus on the Development due to proximity, or the Development would form one element in a panoramic view; and
- Whether the view is transient or one of a sequence of views, as from a moving vehicle or PRow.

#### *Sensitivity of Visual Receptors*

7.31 The sensitivity of visual receptors in views is dependent upon:

- The location and context of the viewpoint;
- The expectation and occupation or activity of the receptor; and
- The importance of the view (which may be determined with respect to its popularity or numbers of people affected, its appearance in guide books or tourist maps and in the facilities provided for its enjoyment, or reference to it in literature or art).

7.32 The most sensitive receptors generally include:

- Users of outdoor recreation facilities, including PRow, whose attention or interest may be focussed on the landscape;
- Communities where the Development results in changes in the landscape setting or value



of views enjoyed by the community; and

- Occupiers of residential properties with views affected by the Development.

7.33 Other receptors include people engaged in outdoor sport and recreation, people travelling through or past the affected landscape in cars, on trains or other transport routes, and people at their place of work. The least sensitive receptors are likely to be people at their place of work, or those engaged in similar activities whose attention may be focussed on their work or activity and therefore potentially less susceptible to changes in the view. Table 7.3 sets out the classifications for visual receptor sensitivity.

**Table 7.3: Visual Receptor Sensitivity Criteria**

Magnitude	Criteria
High	Activity resulting in a high interest or appreciation of the view (e.g. residents or people engaged in outdoor recreation whose attention is largely focussed on the landscape) and/or a high value of existing view (e.g. unspoilt countryside or a Conservation Area).
Medium	Activity resulting in a medium interest or appreciation of the view (e.g. people engaged in outdoor recreation that does not largely focus on an appreciation of the landscape i.e. motorists travelling through an area along rural roads) and/or a medium value of existing view (e.g. suburban residential areas or intensively farmed countryside).
Low	Activity resulting in a low interest or appreciation of the view (e.g. people at work or motorists travelling through an area on fast roads) and/or low value of existing view (e.g. industrial areas or derelict land).

#### *Magnitude of Visual Effects*

7.34 In the evaluation of the effects on views and the visual amenity of the identified receptors, the magnitude of visual effect is described with reference to:

- The scale of change in the view with respect to the loss or addition of features in the view and changes in its composition;
- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements;
- The duration and nature of the effect, whether temporary or permanent, intermittent or continuous;
- The angle of view in relation to the main activity of the receptor;
- The distance of the viewpoint from the Development; and
- The extent of the area over which the changes would be visible.

7.35 The magnitude of visual effect results from a combination of the degree of change to the view resulting from the Development with consideration of the extent of the area over which the changes would be visible, the period of exposure to the view and reversibility. The magnitude of visual effect classifications are set out in Table 7.4.

**Table 7.4: Magnitude of Visual Effects Criteria**

Magnitude	Criteria
Large	Where the Development would cause a substantial degree of change in the existing view (e.g. loss of characteristic features) and/or high degree of exposure to view (e.g. near-distance or open views).
Medium	Where the Development would cause a noticeable degree of change in the existing view (e.g. partial loss of characteristic features) and/or medium degree of exposure to view (e.g. middle distance or partial views).
Small	Where the Development would cause a discernible change in the existing view (e.g. limited loss of characteristic features) and/or low degree of exposure to view (e.g. long-distance, interrupted or glimpsed views).
Very Small	Where the Development would cause a barely perceptible change to the existing view.
Neutral	Where the Development would cause no apparent change in the existing view.

### Significance of Effects

- 7.36 Significance is not absolute and can only be identified in relation to each individual development and its unique location. It is important that the assessment of significance adopts an informed and well-reasoned judgement, supported through a clear justification as to how the conclusions for each effect have been derived. It should be emphasised that whilst this methodology is designed to be robust and transparent, professional judgement is ultimately applied to determine the level of significance for each effect.
- 7.37 The two principal criteria determining the significance of effects are the magnitude of effect and the sensitivity of the resource or receptor. With regard to visual receptors, a major significance of effect would likely occur when high sensitivity receptors such as those in their place of residence would experience a substantial change in the view. A minor significance of effect is more likely to result for the least sensitive receptors, such as those utilising transport corridors, as the viewers would be affected for a lesser period of time as they would experience transient views. Where no change is identified the significance of effect is assessed as neutral.

### Significance Thresholds

- 7.38 The significance thresholds are determined by considering the sensitivity of the receptor alongside the magnitude of effect that would be experienced, with reference to any general terminology accepted for the Environmental Statement. Table 7.5 sets out the significance thresholds used within this landscape and visual impact assessment. Effects which are graded as being major or moderate are considered significant in EIA terms. Effects which are graded as minor or below still constitute effects which warrant being brought to the attention of the decision-maker, although they are not considered significant in EIA terms.

**Table 7.5: Significance Matrix**

		Magnitude				
		Neutral	Very Small	Small	Medium	Large
Sensitivity	Low	Neutral	Negligible	Negligible	Negligible	Minor
	Medium	Neutral	Negligible	Negligible	Minor	Moderate
	High	Neutral	Negligible	Minor	Moderate	Major

7.39 The significance matrix provided in Table 7.5 is utilised as a guide only. Each case should be assessed on its own merits using professional judgement and experience. There is no clear defined boundary between differing levels of significance.

### Mitigation

7.40 The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant, negative (adverse) effects on the environment arising from the Development. Mitigation is thus not solely concerned with *damage limitation*, but may also consider measures that could compensate for unavoidable residual effects. Mitigation measures may be considered under two categories:

- Primary measures that intrinsically comprise part of the Development design through an iterative process; and
- Secondary measures designed to specifically address the remaining (residual) adverse effects of the final Development.

7.41 Strategies to address likely adverse effects include:

- Avoid or reduce impact by changing the form of the Development;
- Remediation of impacts e.g. by planting to *soften*, absorb and assimilate the Development into the landscape;
- Compensation of impact e.g. by replacing felled trees with new trees; and
- Enhancement e.g. the creation of a new landscape type or habitat.

7.42 Guidelines for Mitigation:

- All adverse landscape and visual effects that are likely to occur throughout the project life cycle should be considered for mitigation, although the statutory requirement is limited to significant effects;
- Consultation with local community and special interest groups on the proposed mitigation measures is important;

- Landscape mitigation measures should be designed to suit the existing landscape character and needs of the locality, respecting and building on local landscape distinctiveness and helping to address any relevant existing issues in the landscape;
- It must be recognised that many mitigation measures, especially planting, are not immediately effective. Where planting is intended to provide *softening* and assist in *visually absorbing* the Development, it may also be appropriate to assess residual effects for different periods of time and/or at maturity if required;
- The developer should demonstrate a commitment to the implementation of mitigation measures to an agreed programme and budget;
- The proposed mitigation measures should address specific issues and performance standards should be identified for the establishment, management, maintenance and monitoring of new landscape features; and
- A programme of appropriate monitoring may be agreed with the regulatory authority, so that compliance and effectiveness can be readily monitored and evaluated.

7.43 Common Mitigation Measures include:

- Sensitive location and siting;
- Site layout;
- Choice of Site level;
- Appropriate form, materials and design of buildings. It is not always practical or desirable to screen buildings. In these cases the scale, design, colour and texture of buildings should be carefully considered;
- Lighting;
- Ground modelling (may in itself be an adverse impact unless carefully integrated into the existing landform);
- Planting (structural planting can help to integrate and soften the Development as well as being of potential value as a wildlife habitat); and
- Use of recessive colouration.