Solar Photovoltaic Project
at Land at Sweeting Thorns, Holme

Landscape and Visual Report

for Elgar Middleton

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Landscape and Visual Report: Non-Technical Summary

Proposed Solar Photovoltaic Project at Land at Sweeting Thorns, Holme, Scunthorpe.

This report and the accompanying plans and visualisations are an independent and impartial assessment of the landscape and visual effects of a proposed solar photovoltaic development at Land at Sweeting Thorns, Holme, Scunthorpe. The report has been prepared by Chartered Landscape Architects and follows recognised guidance and methods.

Site Context

The 37.38ha site is located on the south-east urban edge of Scunthorpe with the Tata steelworks situated to the north of the site directly across from the A18 dual carriageway. A retail park and residential area are situated to the north-west, separated from the site by an informal open space and flooded gravel pit. The landscape is relatively flat, enclosed and of medium scale. Vegetation consists of blocks of woodland to the east. To the south and south-west are rectilinear fields defined by hedgerows and hedgerow trees which filter or screen views within the area.

The proposed development would introduce an extensive area of solar PV panels into an urban fringe landscape defined by arable fields surrounded by tall hedgerows and ditches, and large areas of woodland, particularly on rising ground to the east of the site. The landscape does not currently contain renewable energy or field-scale solar PV projects, although the Proposal does contains elements such as security fencing, which are already present in the immediate vicinity of the site. The field pattern of the site is strongly north-south rectilinear. The south-facing panels would relate well to this pattern, and to the existing ditches and hedgerows which cross the site from east to west. The assessment concludes that the site and surrounding landscape has the capacity to accommodate the proposed development.

Changes to views would be noticeable in close proximity to the site, including views from the public footpath alongside the western boundary of the site, from the A18 and associated cycleway to the north, and from Holme Lane to the south.

Summary of the Principal Landscape and Visual Effects of the Proposal

The principal effects would arise in the immediate vicinity of the site. Changes in landscape character would be evident within approximately 0.2 to 0.4km of the site. Further from the site, changes in views brought about by the proposed development would be less noticeable and in this landscape would be likely to be heavily filtered by intervening woodland and hedgerow

vegetation.

Significant changes in views would occur for residents of Mendle Farmhouse which is just outside the south-west corner of the site. In the long-term these effects may reduce slightly as vegetation on the proposed screening bund in the south-west corner of the site matures.

A public right of way follows the western boundary of the site for 1.3km. Changes in views would be significant for users of this footpath. Effects would be difficult to mitigate with landscape measures due to the proximity of the footpath to the site.

No significant effects would occur on views in the wider area due to the characteristics of the surrounding landscape, where the gently undulating topography combines with field boundary vegetation or woodland to screen middle and long-distance views.

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1. Introduction

1.1. This Report

Landscape Visual Limited was appointed by Elgar Middleton to produce an independent and impartial landscape and visual report for a proposed solar photovoltaic (PV) development on Land at Sweeting Thorns, Holme ('The Site'). This report has been prepared to accompany a planning submission to North Lincolnshire Council (NLC).

This work has been undertaken by Barrie Gannon DipUD MA CMLI and Angus Jeffery BSc PhD (Cantab) CMLI. The authors are landscape architects with over 40 years' combined experience of landscape and visual assessment of a wide range of development proposals throughout the UK.

1.2. The Proposed Development

The Proposal is for a 27.65MW solar PV development on arable land to the south-east of Scunthorpe. The site would be directly accessed off the A18 which runs along the site's northern boundary. Further description of the Proposal is contained in **Section 3**.

1.3. Methodology

Detailed methodology relating to the landscape and visual impact assessment (LVIA) is contained in **Appendix 1**. Fieldwork was undertaken in July and August 2014.

This study was undertaken in accordance with the following key references:

- Landscape Institute and Institute of Environmental Management and Assessment (2013), *Guidelines for Landscape and Visual Impact Assessment: Third Edition.*[i]
- The Countryside Agency and Scottish Natural Heritage (2002), *Landscape Character Assessment – Guidance for England and Scotland.*[ii]

Further references are contained in **Appendix 5**.

1.4. Consultation

A Zone of Theoretical Visibility (ZTV) plan, a schedule of viewpoints and an explanation as to why they were chosen, and information on the assessment scope and method, were provided to NLC on 25th September 2014. A brief response was received from Scott Jackson on 10th October 2014, and further emails were exchanged following this regarding viewpoint selection.

1.5. Approach to this Study

The Proposal was screened by NLC as non-Environmental Impact Assessment (EIA) development. This assessment is a detailed LVIA and aims to determine the *likely significant* effects of the Proposal.

The following work stages have been undertaken:

1. Desk study collating information on potential receptors (landscape and visual). Preparation of Geographic Information System (GIS)-based maps.
2. Fieldwork to photograph viewpoints and assess the baseline landscape and visual environment.
3. Assessment of the value and quality of the surrounding landscape, landscape and visual receptor sensitivity, the potential magnitude of impacts and the significance of effects.
4. Assessment of direct and indirect impacts on the landscape and visual environment.

2. Landscape and Visual Baseline Conditions

2.1. Landscape Baseline

2.1.1. National Character Areas

The site lies in the *Northern Lincolnshire Edge with Coversands* National Character Area (NCA 45)[iii].

> *'This NCA comprises a ridge of Jurassic limestone running north from Lincoln to the Humber Estuary. The scarp slope rises prominently from adjacent low-lying land, forming the edge or cliff, and giving panoramic views out, in particular to the west. In the north is a second, lower scarp of ironstone. In the vicinity of Scunthorpe are the Coversands, post-glacial wind-blown sands which have given rise to mosaics of heathland, acid grassland and oak/birch woodland.'*

Key characteristics of the NCA are summarised in **Appendix 2**.

2.1.2. North Lincolnshire Landscape Character Areas[iv]

The *North Lincolnshire Edge with Coversands* NCA is re-named at county level as the *Lincolnshire Edge* Landscape Character Area (LCA) and is described as follows:

> *'The district has a landscape character that is similarly related to its underlying geology. The solid geology of North Lincolnshire is relatively simple consisting almost entirely of Jurassic and Cretaceous rocks that dip regularly eastwards in continuous belts from north to south. The topography presents a correspondingly simple and regular arrangement, the limestone and chalk standing out as the west facing escarpments of the Wolds and the Lincoln Edge, separated by valleys underlain by Jurassic clays. Much of the solid rock of North Lincolnshire is however overlain by glacial deposits of boulder clays, sands and gravels that add complexity to the overall picture and contribute to local variation in landscape character. Extensive deposits of sands and gravels, so called coversands, which derive from Bunter Sandstones further west beyond the Trent, have been blown in an easterly direction across the landscape to build up against west facing escarpments…'*

2.1.3. North Lincolnshire Landscape Character Types[iv]

At a local level the site lies within the *Wooded Scarp Slope – Manton, Raventhorpe and Santon* Landscape Character Type (LCT) (**Figure 1176/01b**). The key characteristics of this LCT are described as follows:

i. 'Sinuous scarp slope overlain by coversands and designated as an Area of High Landscape Value.

ii. West facing slopes are extensively wooded with small areas of arable farmland, pasture, scrub and

rough grass.

iii. *Where vegetation is limited, views towards Scunthorpe are extensive, otherwise the landscape is well enclosed and of intimate scale.*

iv. *Significant areas have been left to nature, resulting in mainly deciduous woodland with birch, pine, larch, oak, gorse and rhododendron.*

v. *Ecologically important area, with three sites of Nature Conservation Interest.'*

The *Wooded Scarp Slope* LCT is strongly defined by the topography of the scarp slope. The boundary of this LCT in the surrounding area tends to follow a 20 or 25m contour. The site is lower-lying than this and displays similarities to the area of *Open Undulating Farmland* LCT to the west. The *Open Undulating Farmland - Messingham, Holme and west of Kirton in Lindsey* LCT, is described as follows:

i. *'Broad gently undulating landscape, including a shallow scarp slope.*

ii. *Mainly arable farmland with pasture areas and some evidence of farm diversification, e.g. pig farming, Poultry farming.*

iii. *Evidence of hedgerow loss giving rise to an overall lack of cohesive field boundaries.*

iv. *Enclosure provided by shelterbelts, woodland copses and hedgerow remnants.*

v. *Traditional farm buildings scattered throughout the area.*

vi. *Settlements consist of local stone and red brick mixed.*

vii. *Evidence of ditches for land drainage purposes.'*

For the purposes of this assessment, the site is taken to lie on the boundary of the *Wooded Scarp Slope* and *Open Undulating Farmland* LCTs, as it displays characteristics of both areas.

2.1.4. Landscape Character of the Site and Surrounding Area

The character of the surrounding area is illustrated by viewpoint photographs, **Figure 1176/05**. The site is shown in the foreground of *viewpoints 1* to *5,* (**Figure 1176/05**).

The site is approximately 37.38ha of mainly arable farmland to the south-east of Scunthorpe. The site is made up of five rectangular medium-scale fields (roughly 35ha) and a fenced area of vacant brownfield land (roughly 2.5ha) which appears to have formerly been a storage compound. The site is elongated from north to south with three slightly larger, and two slightly smaller fields. The two smaller fields are situated in the northern part of the site. The site abuts the A18 to the north. Sweeting Thorns woodland is situated to the east. Arable farmland,

woodland and pasture land lie to the west. The southern boundary of the site is formed by Holme Lane. The site lies on the boundary of the *Wooded Scarp Slope* and the *Open Undulating Farmland - Messingham, Holme and west of Kirton in Lindsey* LCTs.

The northern site boundary is approximately 0.4km long and adjoins the A18 dual carriageway. The boundary is formed by a mature hedgerow consisting principally of hawthorn, managed to a height of roughly 3m. The hedgerow is for the most part intact, with occasional gaps. The eastern boundary consists of a shallow ditch which separates the site from Sweeting Thorns, a block of mature woodland consisting of oak, birch and pine. This eastern boundary is approximately 1.1km long. The southern site boundary consists of a wide unmanaged hedgerow and continuous line of mature trees. The trees here are approximately 20m high and include oak, beech and birch. The western boundary consists of a field access track, ditch and hedgerow with hedgerow trees. The hedgerow is principally hawthorn and is managed to a height ranging from roughly 4m in the south to 2m in the north. A public footpath (footpath number 211) runs along the full extent of the western boundary along the field access track, connecting Holme Lane in the south with the A18 dual carriageway in the north. There is a pedestrian crossing on the A18 connecting with the Tata steelworks beyond. The north-west site boundary is off-set approximately 25m to the east of the public footpath and defined by a drainage dyke and line of mature oak trees. A steel palisade fence, 2.5m high, is situated within the north-east corner of the site surrounding the vacant plot which contains derelict buildings and an area of hard-standing probably previously connected with the steelworks.

The five arable fields which make up most of the site are bounded and bisected by a series of connected drainage dykes flowing west which all discharge into Bottesford Beck. Alongside two of the dykes, aligned in an east-west direction, are remnant hedgerows and occasional hedgerow trees consisting mainly of oak.

The key landscape and visual aspects of the site and surrounding area are summarised as follows:

- *Landform*: the topography of the surrounding area is shown on **Figure 1176/01** and is defined by a relatively flat landform falling gently to the south-west, drained by a series of connected field dykes which flow into Bottesford Beck, which joins with the River Trent at East Butterwick 8.8km away. Land to the north and north-west and to the east rises above general site levels and provides a degree of enclosure to the site. The site appears flat and lies between approximately 14 and 15.5m Above Ordnance

Datum (AOD). There is a slight fall in the site from east to west. To the east at a distance of roughly 1.5km is the eastern limestone escarpment, which rises to a height of 50m AOD and runs north to south.

- *Scale and enclosure*: the mixture of arable fields and woodlands creates a medium-scale landscape. Mature hedgerows, hedgerow trees and field drainage dykes are features of the arable landscape, and are interspersed with blocks of mature woodland. The escarpment to the east of Scunthorpe contains one of the largest continuous areas of woodland in the region. The combination of mature woodland and hedgerows results in very limited near-distance views into the surrounding landscape from the site.
- *Land cover pattern*: the field pattern is one of medium-scale rectilinear fields, probably dating to late 18th or 19th Century parliamentary enclosures interspersed with woodland blocks, particularly to the east and south-west.
- *Settlement*: the residential and retail fringes of Scunthorpe to the north-west are sited on landform which gradually rises to 45m AOD in the town centre at a distance of 3.5km from the site. Views of urban areas from the site are limited. The Tata steelworks occupies a large area of land to the north. It is a prominent feature in the landscape and visible from large parts of the wider area. The hamlet of Holme, and farmsteads and dwellings along Holme Lane to the west are likely to have limited visibility of the development site.
- *Landmarks/important landscape features/prominent built structures*: the most notable feature is the Tata steelworks which is a dominant feature on the skyline to the north.
- *Skyline/connections with adjacent landscapes*: the public footpath along the western boundary of the site affords most views from the site with the view to the north being the most dramatic towards the Tata steelworks site. Views to the west and south are impeded by intervening vegetation. Views to the north-east and east are of a gently rising, wooded landform comprised of the eastern limestone escarpment.
- *Remoteness and tranquility*: the area around the site to the north-west has an urban fringe character which is heavily influenced by the A18 dual carriageway. The noise from passing traffic is a relatively constant feature. Noise from the M180 can also be heard to the south. Public access to the site is gained by the public footpath along the site's western boundary which is aligned north-south. This path offers a sense of rural agricultural landscape in the urban fringe, although the steelworks is also present in views northwards. Areas of arable fields and woodlands further to the west and east

of the site have little public access. The exception to this is the informal open space to the north-west, adjacent to the Lakeside development.

2.1.5. Designated Landscapes

There are no nationally designated landscapes in the vicinity of the site. There is however an Area of High Landscape Value (AHLV) immediately to the east of the application site. The AHLV generally follows the topography of the eastern escarpment and contains large areas of continuous woodland. The AHLV is a non-statutory designation of County importance which is afforded some degree of protection by its designation.

2.2. Visual Environment

2.2.1. Potential Visual Receptors

Potential visual receptors in the study area include local residents or workers, those travelling through the landscape, and visitors or recreational landscape users. For brevity, potential visual receptors are introduced in the assessment of effects (**Section 4.4**) rather than in this baseline section.

3. The Proposed Development

3.1. The Solar PV Scheme

Details of the proposed solar arrays are provided on the application drawings and **Figure 1176/06**. The panels would be arranged in 4 modules by 11 modules in landscape format with a back height of 2.9m. In addition there would be 23 transformer buildings, one substation building, and one private switchgear building. The dimensions of the transformer building would be 6.04m long by 2.60m high by 2.44m wide. The dimensions of the private switchgear building would be 6.06m long by 2.91m high by 2.45m wide. The inter-row distance would be approximately 2.03m. Panels would be set at an angle of 20 degrees from the horizontal. Steel fencing (1.9m high) would extend around the whole of the site perimeter for security purposes. Fencing alignment would be on the inside of any existing fencing and hedges on the site perimeter, which would all be retained. CCTV masts 3m high would be located approximately every 50m along the perimeter fence.

3.2. The Potential Landscape and Visual Effects of the Proposal

This section describes the main aspects of the proposed development which could potentially affect landscape and/or visual amenity. It also identifies features of the proposals which would assist in mitigating landscape and visual impacts.

The main features of the solar array proposal which could potentially result in landscape and visual impacts are:

- Construction activity
- Changes to landform, use and pattern
- Loss of existing vegetation
- Access arrangements
- Hard surface areas
- New elements such as solar PV panels, lighting, fencing and signage
- New buildings including design and materials selection
- New planting areas.

It is noted that the proposed development is 3m or less in height. Therefore it could be screened by hedgerows, especially in a flat landscape where distant views are limited and elevated

viewpoints absent.

3.3. Potential Construction Impacts

Construction activities would include the creation of a temporary compound, the laying of access tracks, the excavation and construction of areas of hard standing to access inverter buildings and the Distribution Network Operator's substation, together with cable-trenching and laying activities.

Construction activities would not give rise to significant landscape or visual effects over and above those of the site when it is operational.

3.4. Mitigation Measures

Landscape mitigation measures are incorporated into the scheme design and include measures to reduce the visual prominence of the solar arrays (**Figure 1176/06**). It is proposed that hedgerow gapping-up measures are carried out along the northern and southern hedgerows bordering the A18 and Holme Lane respectively. A 2m high 6m wide bund approximately 140m long would be created at the south-west corner of the site to encourage screening of views from Mendle Farm on Holme Lane and the road at the south-western entrance to the footpath. This bund would be planted with a native hedgerow mix containing up to 25% holly, to ensure a degree of screening during the winter months. A long-term hedgerow management regime would also be adopted to include cutting hedgerows to a minimum height of 4.0m, and to encourage them to grow denser and wider. New hedgerows are proposed to run alongside some of the drains which cross the site from east to west. A wildflower buffer/lowland meadow area for conservation purposes would also be established separating the public footpath alongside the site's western boundary and the security fence. This grassland buffer would be at least 8m wide alongside the public footpath which runs along the western boundary of the site. This means that there would be 8m separation between the footpath and the security fence for all of the route, apart from where new east/west hedgerows cross the site where the separation would narrow to 2m. The footpath is within the red-line boundary so the solar farm operator would be able to undertake appropriate management of the path and nearby mitigation measures.

A landscape management plan would set out provisions for management of mitigation measures (Aardvark EM, October 2014, '*Landscape and Ecological Management Plan In support of a planning application for the installation of Standalone Solar PV modules and Associated Infrastructure on land at Sweeting Thorns, Scunthorpe*').

4. Impact Assessment

The impact assessment considers the changes which would result from the Proposal and judges their significance against the criteria set out in **Appendix 1**. Landscape and visual effects are determined by assessing the magnitude of impact against the sensitivity of the receptor. The significance of an effect is a function of the magnitude of the landscape or visual impact and the landscape or visual receptor's sensitivity (see **Table A1.5**).

In this assessment, potential effects are considered at the following timescales:

- **During construction**: focussing on construction-related landscape and visual effects.
- **On completion**: the effects when the construction phase is complete and the operational phase of the project starts.
- **Long-term**, taken to be 15 years post-completion: this timescale allows the assessment to consider effects once landscaping mitigation measures mature.

Landscape and visual effects of the Proposal are assessed against the existing landscape and visual baseline as described in **Section 2** of this report.

4.1. Landscape Evaluation of The Site and Surrounding Area

4.1.1. Landscape Value

The site and surrounding area does not fall within a nationally designated landscape. An AHLV abuts the eastern boundary of the site. This AHLV includes the woodlands which cover the eastern limestone escarpment. One of the functions of this non-statutory designation is to seek to maintain and enhance the character of the area and to ensure that development would not detract from the visual amenity of the area.

The landscape is on the south-eastern edge of Scunthorpe and is influenced by urban-fringe development. The retail park and new-build housing development at Lakeside to the north-west of the site is being progressively extended in a westerly direction. Ashby Ville Pond provides the development's focal point. This is a disused mineral extraction site which has been allowed to flood and provides an important informal open space within the area. To the north is the Tata steelworks which dominates the northern skyline. To the east the site adjoins Sweeting Thorn

woodland which connects to woodlands on the gently rising wooded scarp slope which runs north to south through the region. This upland area continues further east with land uses comprising of heathy woodland and pasture land. Land to the south and east continues as undulating arable farmland.

The strongest component of local character is derived from the underlying patterns created by the gently undulating topography, the scarp slope to the east and the intricate mix of arable and woodland landcover. The footpath alongside the western edge of the site is one of few footpaths in this part of the urban fringe and surrounding rural area. The informal recreational area at Lakeside is of value but is relatively inaccessible from the site.

On balance, the value of the local landscape is considered to be **medium**.

4.1.2. Landscape Susceptibility

The susceptibility of a landscape can be defined as '*its ability…to accommodate the specific proposed development without undue negative consequences*'[i]. Further explanation of susceptibility is contained in **Appendix 1**. **Table 4.1** summarises relevant factors with respect to the susceptibility of the site and surrounding area to the Proposal.

Table 4.1: Landscape Susceptibility

Factor	Analysis with respect to landscape susceptibility
Existing character	The site adjoins the urban fringe in open undulating farmland. The site character is influenced by the contrasting elements of the steelworks to the north, and the rural character derived from the arable and woodland land use. With respect to this factor, the landscape of the site and surrounding area would have a **medium** susceptibility to the Proposal.
Visual context	Although this is a rural, arable landscape, near-distance views of the steelworks exert a strong influence with extensive views of sloping scarp woodlands rising to the east. There are no distant views from the site. With respect to this factor, the landscape of the site and surrounding area would have a **low to medium** susceptibility to the Proposal.
Landform	The arable farmland within the site and surrounding area is relatively enclosed by surrounding woodlands and hedgerows. The landform, combined with large woodland blocks, means that there are no visually exposed slopes. The landform can accommodate development of the type proposed. With respect to this factor, the landscape of the site and surrounding area would have a **low to medium** susceptibility to the Proposal.
Landscape condition	The landscape is in fair condition. The fringe landscape contains a recreational lake and golf course and farmstead clusters with gappy hedgerows along drainage dykes. With respect to this factor, the landscape of the site and surrounding area would have a **low to medium** susceptibility to the Proposal.
Scale/field pattern	The simple and relatively enclosed rural landscape of medium-scale rectilinear fields, relative to areas of continuous woodland to the east, would have a **low** susceptibility to the Proposal.

Factor	Analysis with respect to landscape susceptibility
Land cover pattern	The site lies on the edge of the urban area and is comprised of five arable fields which are bounded by woodland and tall hedgerows, and vacant compound which is surrounded by security fencing. Although the character is strongly influenced by the urban fringe, these areas of woodland and arable fields contain features associated with more rural, agricultural character areas to the south and south-west. With respect to this factor, the landscape of the site and surrounding area would have a **medium** susceptibility to the Proposal.
Settlement pattern	The settlement pattern is one of farmsteads and isolated properties within the arable landscape situated to the south and east of industrial, retail and residential areas. This pattern would have a **low to medium** susceptibility to the Proposal.
Historic landscape features	The site field pattern is likely to originate from 18th or 19th Century enclosures. There is an absence of listed buildings, scheduled monuments and other designated features in the vicinity. This factor would indicate the landscape of the site and surrounding area would have a **low** susceptibility to the Proposal. Further information is contained in the Historic Environment Assessment.

On balance, analysis of the above factors indicates that the site and surrounding area would have a **low to medium** susceptibility to the proposed development.

4.1.3. Landscape Sensitivity

The site has a **medium** value (**Section 4.1.1**) and a **low to medium** susceptibility to the type of development proposed (**Section 4.1.2**). This assessment concludes that the landscape of the site and surrounding area would have a **medium to low** sensitivity to the proposed development. Characteristics of the landscape such as topography, scale and enclosure, field and landcover pattern, do not identify particular sensitivities to the proposed development.

4.2. Effects on On-site Landscape Features

The following direct effects would arise during construction:

- Removal of a 10m section of fencing along the north-east site boundary to provide site access off the existing A18 slip road.
- The replacement of approximately 35ha of arable land and 2.5ha of vacant brownfield land with a field-scale solar PV development.

On completion, effects on on-site landscape features would result in a planned field-scale solar PV development, as described in **Section 3.1**. Key aspects of the landscaping treatment of the site are shown in the Site Layout and Landscape Proposals Plan (**Figure 1176/06**), and include a landscape buffer on the north-western edge, management of existing tree and hedgerow planting including gapping-up measures, additional tree and hedgerow planting, and the creation of a

planted screening bund in the south-west corner of the site.

The effect on on-site landscape features would relate primarily to the change in land-cover to renewable energy development. There would be minimal disturbance to existing landscape features. Characteristics of the landscape such as landform and field pattern would not be altered by the development, with all important features such as hedgerows and ditches remaining intact. The replacement of the vacant compound in the north-east corner of the site would be a beneficial effect. In the long-term, land-cover could revert to agriculture were all the elements of the solar PV development to be removed (including solar panels, buildings, and fencing).

The overall direct effect on on-site landscape features would be **medium to high** magnitude. For a **medium to low** sensitivity landscape, these effects would be of **moderate to moderate/major adverse** significance.

The Proposal would introduce new features into the arable landscape, such as the solar PV panels and perimeter fencing. While some of the elements of the Proposal are present in areas on or near the site (for example security fencing around the vacant compound in the north-east corner of the site), the development would effectively extend the influence of built development into the urban fringe landscape to the south of the A18.

4.3. Landscape Character Effects

Besides the direct effects on landscape as described above in **Section 4.2**, the Proposal would bring about effects on the landscape character of the host LCT.

The proposed development would be situated on the boundary of the *Open Undulating Farmland* and *Wooded Scarp Slope* LCTs. Locating a solar PV development in this landscape would introduce a modern low-level engineered element into a medium-scale arable landscape in Scunthorpe's urban fringe. The solar PV development would be a contrasting element in the context of the arable/woodland landcover. As a development which contains strongly linear elements, the Proposal would relate well to the relatively flat topography and rectilinear field pattern of the *Open Undulating Farmland* LCT. Locally, the development would abut woodland to the east extending north and south and merging into the *Wooded Scarp Slope* LCT of the Lincolnshire Edge escarpment.

Scale and enclosure: The surrounding area is a medium-scale and relatively enclosed landscape which contains very limited long-distance views. The scale and enclosure of the landscape can accommodate a solar PV development of the size proposed.

Landform: Locally, the proposed development would be situated within gently undulating arable farmland draining to the west with rising landform to the east in the form of the Lincolnshire Edge escarpment. The site landform is relatively flat and can accommodate the proposed development without adverse effects on landform.

Landscape pattern: The Proposal would be situated within a relatively enclosed part of the *Open Undulating Farmland - Messingham, Holme and west of Kirton in Lindsey* LCT. The medium-scale fields which make up the site are strongly rectilinear and are capable of accommodating low-level development which also has strongly linear components.

Skylines: There would be a negligible impact on the skyline, as the proposed low-level development would be contained by rising landform to the east and views in all directions would be restricted by field boundary vegetation or woodland.

Built features/landmarks: The Tata steel plant dominates views to the north of the development rising above hedgerow and woodland cover, with the mass of the built form viewed from the site being aligned east-west. The landscape contains features which are related to the rural, agricultural character but is also strongly influenced by nearby main roads and motorways, the industrial landscape to the north, and the residential and retail landscapes to the north-west. These influences would indicate capacity for well-planned renewable energy development in the urban fringe.

Extent of landscape character effects

In this landscape, the proposed development would not be a prominent or a defining feature beyond the immediate area of the site.

Landscape effects would reduce with distance. Within approximately 0.2 to 0.4km of the proposed development, the landscape character effects during construction and on completion would be of up to **medium to high** magnitude and of **moderate/major adverse** significance. Effects during construction and on completion would reduce with increasing distance from the site, and beyond approximately 0.5km would be of **negligible/slight adverse** significance.

In the long-term, the landscape mitigation which forms part of the Proposal would mature, reducing the effects on landscape character. The long-term effects within approximately 0.2 to 0.4km of the site would be **medium** magnitude and **moderate adverse** significance. Beyond approximately 0.5km, the long-term effects on landscape character would be of **negligible adverse** significance.

The overall long-term effect on the character of the *Lincolnshire Edge* LCA would be **negligible**.

Landscape character effects, including effects on the surrounding LCT, are summarised below:

Table 4.2: Summary of Landscape Character Effects

LCT	Relevant Key Characteristics[iv]	Effect and Significance
Open Undulating Farmland Host LCT *Medium sensitivity*	*'Broad, gently undulating landscape, including a shallow scarp slope.* *'Mainly arable farmland with pasture areas and some evidence of farm diversification, e.g. pig farming, poultry farming.* *'Enclosure provided by shelterbelts, woodland copses and hedgerow remnants.'*	Direct effects on features in this LCT would arise, as described in **Section 4.2**. Effects on character would result from the installation of the solar PV development. Locating a solar PV development in this landscape would introduce a modern low-level engineered element into a medium-scale arable landscape in the urban fringe. The solar PV development would be a contrasting element in the context of the arable/woodland landcover. As a development which contains strongly linear elements, the Proposal would relate well to the relatively flat topography and rectilinear field pattern of the *Open Undulating Farmland* LCT. Locally, the development would abut woodland to the east extending north and south and merging into the *Wooded Scarp Slope* LCT of the Lincolnshire Edge escarpment. During construction, the indirect effects on landscape character outside of the development boundary would relate to the movement of construction vehicles. Construction activity on site would be noticeable within close proximity of the site. Effects of up to **medium to high** magnitude and **moderate/major** adverse significance would arise. On completion, effects of **medium to high** magnitude and **moderate/major adverse** significance would arise. In the long-term as landscape mitigation measures mature, effects would reduce to **medium** magnitude and **moderate adverse** significance. Indirect effects would be concentrated within 0.2km of the site, and would reduce with increasing distance from the site. Effects would not be noticeable beyond approximately 0.4km from the site.
Wooded Scarp Slope Host LCT *Medium to high sensitivity*	*'Sinuous scarp slope overlain by coversands and designated as an Area of High Landscape Value.* *'West facing slopes are extensively wooded with small areas of arable farmland, pasture, scrub and rough grass.* *'Where vegetation is limited, views towards Scunthorpe are extensive, otherwise the landscape is well enclosed and of intimate scale.'*	Direct effects on features in this LCT would arise, as described in **Section 5.2**. During construction, effects of up to **medium to high** magnitude and **moderate/major adverse** significance would arise. On completion, effects of **medium to high** magnitude and **moderate/major adverse** significance would arise. In the long-term as landscape mitigation measures mature, effects would reduce to **medium** magnitude and **moderate adverse** significance. In this densely wooded LCT, indirect effects would be concentrated within 0.1km of the site, and would reduce rapidly with increasing distance from the site. Effects would not be noticeable beyond approximately 0.2km from the site.
Wooded Undulating	*'Rolling, mainly arable farmland of open,*	Indirect effects on the character of this LCT would occur

LCT	Relevant Key Characteristics[iv]	Effect and Significance
Farmland LCT Adjoining host LCT to south *Medium sensitivity*	*rural character.* *'Enclosure of medium sized fields provided by mixed woodland blocks and shelterbelts.* *'Field boundaries defined by hedgerows, both maintained and overgrown with hedgerow trees…'*	within approximately 0.2 to 0.4km of the site. During construction, effects of up to **medium** magnitude and **moderate adverse** significance would arise. On completion, these effects would be of **medium** magnitude and **moderate adverse** significance. In the long-term as landscape mitigation measures mature, effects would reduce to **low to medium** magnitude and **slight to moderate adverse** significance.
Industrial Landscape LCT Adjoining host LCT to north *Low sensitivity*	*'Flat, bleak, predominantly hard landscape overwhelmed by large scale industry and derelict land.* *'Areas of high enclosure provided by density and scale of industry, ranging to openness with views across expanses of derelict land.* *'Complex, chaotic character exaggerated by lack of cohesive structure and little, or insignificant landscape improvements. Area dominated by industry and associated infrastructure, i.e. roads, security fencing, electricity poles, etc.'*	Indirect effects on the character of this LCT would occur within approximately 0.2 to 0.4km of the site. During construction, effects of up to **medium** magnitude and **slight adverse** significance would arise. On completion, these effects would be of **medium** magnitude and **slight adverse** significance. In the long-term as landscape mitigation measures mature, effects would reduce to **low to medium** magnitude and **negligible/slight adverse** significance.
Urban Area LCT 0.5km to the north-west of the site *Low sensitivity*	Character area defined by the built-up area of Scunthorpe and its suburbs.	Indirect effects on the character of this LCT would occur within approximately 0.2 to 0.4km of the site. During construction, effects of up to **medium** magnitude and **slight adverse** significance would arise. On completion, these effects would be of **medium** magnitude and **slight adverse** significance. In the long-term as landscape mitigation measures mature, effects would reduce to **low to medium** magnitude and **negligible/slight adverse** significance.
Heathy Woodland LCT 1km to the east of the site *Medium sensitivity*	*'Elevated, gently undulating landscape of deciduous and coniferous woodland containing areas of open scrub and heathland.* *'Attractive character, intimate and enclosed, within the woodland contrasting with more open heath areas.* *'Views to the west towards Scunthorpe restricted by vegetation.'*	During construction, on completion and in the long-term, indirect effects would be of **negligible** magnitude and significance.

4.4. Visual Effects

The following aspects of the surrounding landscape are factors influencing views near the site:

- The wooded escarpment to the east of the site restricts views from the east from the *Wooded Scarp Slope* and *Heathy Woodland* LCTs.
- Industrial, retail and residential areas to the north and west restrict views towards the site within the *Industrial Landscape* and *Urban Area* LCTs.

- Within the *Open Undulating Farmland* LCT, and *Wooded Undulating Farmland* LCT, views across the landscape are restricted by patches of woodland, field boundary hedgerows with trees, or by the undulating topography.

4.4.1. Zone of Theoretical Visibility

The bareground ZTV of the proposed development is shown in **Figures 1176/03a** and **03b**. The ZTVs are based on Ordnance Survey Terrain 5 data which includes detailed modelling of significant features such as road, rail, quarries and lakes. The ZTV is strongly influenced by the local topography. Interpretation of the ZTV should be with reference to the methodology in **Appendix 1.**

Within 1km of the Proposal

Within 1km, the ZTV indicates widespread theoretical visibility of the Proposal between the A18 and the M180, and between the upper contours of the scarp slope and the edge of Scunthorpe. However, intervening woodland, mature hedgerows and built form would restrict views from a large extent of this area.

Beyond 1km of the Proposal

To the east, north-east and south-east of the site up to approximately 5km distance, areas of theoretical visibility lie within the upper slopes of the scarp slope of the Lincolnshire Edge. In practice, the heavily wooded nature of this landscape restricts views towards the site.

To the west of the site within approximately 2km, areas of theoretical visibility lie within the *Open Undulating Farmland* LCT. To the south-west of the site to approximately 4km, areas of theoretical visibility lie within the *Wooded Undulating Farmland* and *Open Undulating Farmland* LCTs. In practice, field boundary vegetation and woodlands combine with the undulating topography to restrict views from these areas.

Much of the urban area of Scunthorpe to the north-west of the site at 1 to 4km distance lies within the ZTV. However, views from this area would be absent due to the presence of built form.

In the LCTs surrounding the site, significant visual effects are unlikely to arise from these areas of theoretical visibility beyond 1km from the site.

4.4.2. Viewpoint Assessment

The viewpoint assessment describes the visual effects of the Proposal from 11 viewpoints in the

study area. The assessment is undertaken following the methodology and magnitude and significance criteria contained in **Appendix 1**. The full viewpoint assessment is contained in **Table 4.3**, below. Assessment viewpoints are referred to where relevant in the analysis of effects on visual receptor groups in the following **Section 4.4.3**.

Assessment viewpoint locations are shown on **Figure 1176/04**. Photographs of existing views are shown on **Figure 1176/05**.

Table 4.3: Viewpoint Assessment

Viewpoint	Receptor	Sensitivity	Description and potential visual impacts	Impact Magnitude	Significance of Effect
1. Holme Lane at south-east corner of site 492885, 407017 5m to the south-east of site	Users of Holme Lane	Low	This viewpoint is at a field gate into the site off Holme Lane at the south-east corner of the site. A continuous mature hedgerow boundary which contains trees runs alongside Holme Lane and limits views into the site. Views across the site are of a flat, medium-scale and enclosed arable landscape with fields situated within the site bordered by dykes with trees interspersed along the channels. The Sweeting Thorns woodland borders the site to the east. The steelworks are a dramatic feature on the northern skyline. Receptors at this viewpoint are likely to be local users of Holme Lane. Construction activity on site may be glimpsed from moving vehicles. On completion, glimpsed views of south-facing solar panels would be possible through the field gate. The development proposals would be at a low level relative to field boundary vegetation and with distant hedgerow and woodland vegetation rising beyond. By year 15, hedgerow management to make the hedgerow denser along the site's southern boundary would reduce visual effects.	Construction: High	Construction: Moderate adverse
				Completion: High	Completion: Moderate adverse
				Year 15: Medium	Year 15: Slight adverse
2. Holme Lane 492595, 407026 5m to the south-west of the site	Users of Holme Lane	Low	This viewpoint is at the south-west corner of the site at a field gate and public footpath access (footpath number 211). Views are similar to those experienced in *viewpoint 1,* with Sweeting Thorns forming a dense woodland backcloth to the east and north-east. Receptors at this viewpoint would be road users, who would have a brief, glimpsed view of the Proposal. Footpath users would have more prolonged views of the development and are afforded a higher sensitivity, also reflecting that appreciation of the landscape may be an aspect of using the footpath. On completion, near views of the development would be possible. The view would be of the planted bund in the south-west corner of the site (**Figure 1176/06**). Views would be glimpsed from the road, and more apparent from the footpath, which runs north along the western boundary from this viewpoint. The proposed development would be set back a	Construction: High	Construction: Moderate adverse
				Completion: High	Completion: Moderate adverse
				Year 15: Medium	Year 15: Slight adverse
	Footpath users	Medium		Construction: High	Construction: **Moderate/major adverse**

Viewpoint	Receptor	Sensitivity	Description and potential visual impacts	Impact Magnitude	Significance of Effect
			minimum of 8m from the public footpath and would be situated behind a security fence. The 8m buffer zone would consist of a meadow grassland margin managed for conservation purposes. By year 15, the proposed vegetation on the bund in the south-western corner of the site would reduce visual effects both for the short-duration views glimpsed from the road and for users of the public footpath.		
				Completion: High	Completion: **Moderate/major adverse**
				Year 15: High	Year 15: Moderate to moderate/major adverse
3. Public Right of Way (PROW) along western boundary of the site 492562, 407334 25m to the west of the site	Footpath users	Medium	This viewpoint is part way along the public footpath which runs alongside the western site boundary (footpath number 211). Views are across a flat, medium-scale arable landscape towards Sweeting Thorns woodland. Fields situated within the site are separated by dykes with occasional trees alongside and one mature overgrown hedgerow. The Tata steelworks is a dramatic feature on the northern skyline. Receptors at this viewpoint are likely to be locals using the footpath for recreational purposes or potentially for accessing retail, industrial or residential areas to the north and north-west. From this viewpoint, footpath users would have near views of the solar array. There would be an 8m buffer zone next to the footpath, which would be managed for nature conservation. The rows of solar panels would be visible beyond the security fence. The planted bund in the south-west corner of the site would be noticed in the view to the south.	Construction: High	Construction: **Moderate/major adverse**
				Completion: High	Completion: **Moderate/major adverse**
				Year 15: High	Year 15: **Moderate/major adverse**
4. PROW along western boundary of the site 492517, 407913 25m to the	Footpath users	Medium	This viewpoint is further north than *viewpoint 3* on the PROW which runs along the western boundary. Views across the site are of a relatively flat, medium-scale arable landscape where fields are bordered by dykes with trees interspersed along the dykes. Bottesford Beck and a mature hedgerow run parallel to the western site boundary alongside the public footpath near the viewpoint. The site backcloth consists of Sweeting Thorns to the east	Construction: High	Construction: **Moderate/major adverse**
				Completion: High	Completion: **Moderate/major adverse**

Viewpoint	Receptor	Sensitivity	Description and potential visual impacts	Impact Magnitude	Significance of Effect
west of the site			and the mature treed hedgerow along Holme Lane to the south. Security fencing around the brownfield plot in the north-east corner of the site, and vacant/derelict buildings in this area are in view. Receptors at this viewpoint are likely to be locals using the footpath for recreational purposes or potentially for accessing retail, industrial or residential areas to the north and north-west. From this viewpoint, footpath users would have near views of the solar array. There would be an 8m buffer zone next to the footpath, which would be managed for nature conservation. Beyond the buffer would be a security fence, beyond which the rows of solar panels would be visible.	Year 15: High	Year 15: **Moderate/major adverse**
5. PROW along western boundary of the site 492492, 408318 25m to the north-west corner of the site	Footpath users	Medium	This viewpoint is at the north-west corner of the site. The viewpoint is located immediately at the access to the site from the north. Views across the site are of a flat, medium-scale arable landscape. Fields situated within the site are bordered by dykes with mature remnant hedgerows and mature hedgerow trees. To the west are narrow views of the scarp slope above Sweeting Thorns woodland. Security fencing around the brownfield plot in the north-east corner of the site is in view. Receptors at this viewpoint are likely to be locals using the footpath for recreational purposes or potentially for accessing retail, industrial or residential areas to the north and north-west. Development proposals would be visible behind a security fence off-set from the public footpath. The footpath would be situated within a grassland corridor with a site security fence defining the site's operational boundary to the east and with an existing mature hedgerow to the west. From this viewpoint, the rear aspect of the solar panels would be in view.	Construction: High	Construction: **Moderate/major adverse**
				Completion: High	Completion: **Moderate/major adverse**
				Year 15: High	Year 15: **Moderate/major adverse**
6. Cycleway alongside the eastbound carriageway of the A18	Road and cycleway users	Low	This view is taken from the cycleway alongside the eastbound carriageway of the A18. Views across the highway are of a mature hedgerow boundary with occasional gaps. Views from the A18 are strongly influenced by the steelworks and the main road corridor. Security fencing around the brownfield plot in the north-east corner of the site is in view through a gap	Construction: Medium to high	Construction: Slight to moderate adverse
				Completion: Medium to	Completion:

Viewpoint	Receptor	Sensitivity	Description and potential visual impacts	Impact Magnitude	Significance of Effect
492648 408293 48m north of the site			in the roadside hedgerow. Receptors at this viewpoint would be users of the main road or cycleway and would be expected to have a low sensitivity to change in views. Glimpsed views may be possible through the gaps and above the hedge-line of the rear elevation of the solar arrays aligned east to west. By year 15, mitigation in the form of planting-up gaps in hedgerows and managing their height would reduce visual effects for users of the A18.	high	Slight to moderate adverse
				Year 15: Medium	Year 15: Slight adverse
7. Lakeside: Public access around recreational lake area 492100,408142 397m to the north-west of the site	Users of the informal open space	Medium to high	This viewpoint is at the Lakeside development to the west of the application site to the rear of residential housing development to the east of Lakeside Parkway. Views across the lake/former gravel pit are of a low-level wooded landscape rising up the wooded west-facing landform of the Manton, Raventhorpe and Stanton scarp slope in the middle-distance. The site is heavily filtered by woodland and intervening hedgerow. Views of the proposed development are unlikely to arise.	Construction: Negligible	Construction: Negligible/slight
				Completion: Negligible	Completion: Negligible/slight
				Year 15: Negligible	Year 15: Negligible/slight
8. Lakeside: Recreational route around lake linked to retail park and residential area 491983, 408463 528m west of the site	Users of the informal open space	Medium to high	This viewpoint is at the Lakeside development to the west of the application site to the rear of the retail development and north-east of the residential area. Views across the lake are of a low-level wooded landscape rising up the wooded west-facing landform of the scarp slope in the middle-distance. The site, situated beyond the lake, is heavily filtered by woodland and intervening hedgerows. Views of the proposed development are unlikely to arise.	Construction: Negligible	Construction: Negligible/slight
				Completion: Negligible	Completion: Negligible/slight
				Year 15: Negligible	Year 15: Negligible/slight
9. Road to Raventhorpe Farm: adjacent to the	Road users	Low	This viewpoint is north-east of the site on the road to Raventhorpe Farm. The medieval village of Raventhorpe Scheduled Ancient Monument (SAM) occupies an arable field immediately to the north-west of the viewpoint. Receptors at this viewpoint are likely to be local road users. There is no on-	Construction: No change	Construction: No effect
				Completion:	Completion:

Viewpoint	Receptor	Sensitivity	Description and potential visual impacts	Impact Magnitude	Significance of Effect
medieval village of Raventhorpe (site of) 493719,407761 873m north-east of the site	Footpath users	Medium	site interpretation at the SAM and few visible features. Views of the proposed development would be screened by the mature vegetation of Low Wood and Sweeting Thorns, woodlands which are either side of the A18 in the direction of the site.	No change	No effect
				Year 15: No change	Year 15: No effect
10. Road Bridge over M180 491457, 406433 1.3km south-west of the site	Road users	Low	This viewpoint is on the road bridge over the M180 south-west of the site. The rising landform of the eastern wooded scarp slope forms a relatively prominent skyline. Receptors would be local road users. Woodland and hedgerows screen the site. The development would not be visible.	Construction: No change	Construction: No effect
				Completion: No change	Completion: No effect
				Year 15: No change	Year 15: No effect
11. Holme Lane east of Holme Hall. View from public highway and, nearby residential receptors and PROW 491170,406988 1.4km west of the site	Road users	Low	This view is taken from Holme Lane, to the east of the site. The view is across an undulating medium-scale arable landscape. The steelworks are a dramatic feature on the northern skyline. Hedgerows and mature woodland blocks screen views of the site. The proposed development would not be visible.	Construction: No change	Construction: No effect
	Residents	High		Completion: No change	Completion: No effect
				Year 15: No change	Year 15: No effect

4.4.3. Effects on Visual Receptor Groups

In this section of the report, principal effects on the following visual receptors are considered:

- Residents of nearby settlements (**Table 4.4**)
- Users of footpaths and the recreational landscape (page 31)
- Users of the transport network (page 31).

Settlements/Residential Areas

Table 4.4: Visual effects on settlements and local residents

Receptor / distance and direction from the site	**Description and potential visual impacts**	**Impact magnitude**	**Significance of effect**
Mendle Farmhouse, Melbeck House and Bretton 40 to 75m to the west of the site *High sensitivity*	Mendle Farmhouse is the nearest dwelling to the Proposal. The front of the farmhouse has an easterly aspect. The hedgerow along the western site boundary contains mature trees, but is thin. The farmhouse at Mendle Farm is visible from the PROW which runs along the site's western boundary. Filtered views of the development would be possible from east-facing windows and outside areas on the eastern side of the farmhouse. In the long-term, the proposed planted 2m high bund in the south-western corner of the site would screen views for residents of Mendle Farmhouse from ground level. In the long-term it is probable that the maturing planting on the bund would screen views to the site. There could however continue to be partial views of the site from first floor east-facing windows, particularly during winter months when hedgerows would be slightly less effective in screening views. Holly has been included in the proposed native hedgerow planting mix for the bund to ensure a degree of screening in the winter. Views from Melbeck House and Bretton, which occupy small plots immediately to the south and south-west of Mendle Farmhouse, would be heavily filtered by garden vegetation on the boundaries of these dwellings and near Mendle Farmhouse.	Construction: *Up to* Medium	Construction: *Up to* **Moderate/major adverse**
		Completion: *Up to* Medium	Completion: *Up to* **Moderate/major adverse**
		Year 15: Low to medium	Year 15: **Moderate to moderate/major adverse**
Raventhorpe Lodge 0.1km to the east of the site *High sensitivity*	Raventhorpe Lodge is located near the A18 at the northern end of Sweeting Thorns. The dwelling is entirely surrounded by woodland. Changes in views would not arise.	Completion: No change	Completion: No effect
		Year 15: No change	Year 15: No effect
Farmsteads and individual residential dwellings along Holme Lane	There are approximately 11 dwellings situated along Holme Lane to the west of the site near Sand Vale Farm and Pinewood Farm. Due to roadside, field boundary, and garden vegetation, there would be very limited views to the Proposal.	Completion: *Up to* Negligible	Completion: *Up to* Negligible/slight adverse

Receptor / distance and direction from the site	Description and potential visual impacts	Impact magnitude	Significance of effect
0.2 to 0.65km to the west of the site *High sensitivity*		Year 15: *Up to* Negligible	Year 15: *Up to* Negligible/slight adverse
Farmsteads and individual residential dwellings along Holme Lane 0.45 to 1km to the east of the site *High sensitivity*	There are approximately nine dwellings situated along Holme Lane to the east of the site. This is a heavily wooded area and there would be no views of the Proposal.	Completion: No change	Completion: No effect
		Year 15: No change	Year 15: No effect
Residential development at Lakeside 0.4 to 0.9km to the west of the site *High sensitivity*	*Viewpoints 7* and *8* are on the edge of this newly-completed residential area. The Proposal would not be visible due to woodland and field boundary vegetation.	Completion: No change	Completion: No effect
		Year 15: No change	Year 15: No effect

Public rights of way/Recreational landscape

Users of the public footpath alongside the western boundary of the site (footpath number 211) would have near views towards the proposed development. The footpath follows the western site boundary for approximately 1.3km. *Viewpoints 3, 4 and 5* illustrate the views from the footpath. Effects of **high** magnitude and **moderate/major adverse** significance would arise on completion. Effects on viewpoints on this footpath would not be mitigated by proposed landscaping measures due to the proximity of the development, apart from in the south-western corner of the site near *viewpoint 2,* where the proposed 2m high planted bund would help screen views of the solar PV development by year 15, reducing effects to **moderate to moderate/major adverse** significance. Elsewhere along the footpath, effects at year 15 would remain at **moderate/major adverse** significance.

No significant effects are predicted for users of other PROWs or recreational areas in the study area.

Transport network

Users of the A18 would have views towards the proposed development. *Viewpoint 6* is located on the northern side of the A18 along the cycleway and illustrates a representative view for nearby

road users and cyclists. During construction and on completion, **medium to high** magnitude effects of **slight to moderate adverse** significance would arise for users of the A18 (low sensitivity receptors (LSRs)). In the long-term, as landscaping mitigation measures establish, the effect would reduce to **medium** magnitude and **slight adverse** significance.

Users of Holme Lane, which runs outside the site's southern boundary, would have glimpsed views through field gateways in the south-eastern and south-western corners of the site (*viewpoints 1 and 2*).

A **high** magnitude effect of **moderate adverse** significance would arise during construction and on completion for users of Holme Lane. As landscaping mitigation measures mature, by year 15 effects would reduce to **medium** magnitude and **slight adverse** significance.

No significant effects are predicted for users of other roads in the study area.

4.5. Effects on Designated Landscapes

The western boundary of the AHLV follows the eastern boundary of the site, and is broadly consistent with the scarp slope of the *Lincolnshire Edge* LCA (**Figure 1176/01b**).

4.5.1. Landscape Effects

No direct landscape effects would occur within the AHLV.

Indirect effects on landscape character within the *Wooded Scarp Slope* LCT, which makes up the western edge of the AHLV near the site, would be of **medium** magnitude and **moderate adverse** significance on completion. In the long-term as landscape mitigation measures mature, effects would reduce to **low to medium** magnitude and **slight to moderate adverse** significance.

In the densely wooded LCT which makes up the western edge of the AHLV near the site, indirect effects would be concentrated within approximately 0.1km of the site, and would reduce rapidly with increasing distance from the site. Effects would not be noticeable beyond approximately 0.2km from the site.

4.5.2. Visual Effects

The AHLV to the east of the site is an area of near-continuous woodland. Receptors within the AHLV would tend not to have views of the Proposal. The viewpoint assessment has not determined any *likely significant* effects for receptors in the AHLV.

5. Cumulative Assessment

This section of the report examines potential cumulative landscape and visual effects of the Proposal with other solar PV projects.

5.1. Scope of the Cumulative Assessment

The cumulative assessment aims to be proportionate to *likely significant* effects of the Proposal as an individual project, for which no significant effects were determined beyond approximately 0.5km from the Proposal.

The only cumulative scheme in the locality is the Raventhorpe Farm project (North Lincolnshire reference PA/2014/0892). This is a 38MW scheme located at its nearest between 1km and 2km to the east of the Land at Sweeting Thorns (**Figure 1176/07**). The project covers an area of approximately 83ha. The scheme has been consented by NLC.

5.2. Cumulative Landscape Effects

The Raventhorpe Farm project ('the cumulative assessment scheme' (CAS)) is located almost entirely within the *Heathy Woodland* LCT. The site is separated from this area by the *Wooded Scarp Slope* LCT. This LCT reflects a defined topographic feature which would physically separate the Proposal from the CAS. The *Heathy Woodland* LCT is located outside the Proposal's bareground ZTV, with the exception of the extreme western fringe of the CAS site.

For the Proposal as an individual project, this assessment predicts indirect landscape character effects of **negligible** magnitude and significance for the *Heathy Woodland* LCT (**Section 4.3**). The CAS as an individual scheme would have *likely significant* landscape effects on the *Heathy Woodland* LCT, with effects extending into the *Wooded Scarp Slope* LCT to the west.

With the heavily wooded scarp slope separating the Proposal from the CAS, the indirect effects of either scheme would reduce rapidly in the direction of the other. There would not be overlap in the zones in which either project would have significant landscape effects as an individual scheme.

If both schemes were to be installed, large-scale solar PV development would become a local feature of the LCTs to the east and south of the *Industrial Landscape* LCT, which is defined by the steelworks. The overall cumulative landscape character effect on the *Lincolnshire Edge* LCA would be of **slight** significance.

5.3. Combined Visual Effects

Combined visual effects are where it is possible to see two or more projects from one location, either *in combination* (in the viewer's same field of view at any one time), or *in succession* (in different fields of view from the same location).

Due to dense woodland and the topography of the scarp slope, the CAS would not be visible from the Land at Sweeting Thorns. Due also to field boundary vegetation in the surrounding landscape, the CAS would not be visible from most of the assessment viewpoints considered in **Section 4.4.2**.

The only viewpoint from where the CAS would be visible is *viewpoint 9,* near Raventhorpe Farm. From this viewpoint, the south-eastern corner of the CAS would be in view to the east and south-east of the viewpoint. The Proposal at the Land at Sweeting Thorns lies to the south-west of the viewpoint, but would not be visible due to the presence of screening vegetation. A combined visual effect *in succession* would not arise.

No *likely significant* combined visual effects would arise for the CAS and the Proposal.

5.4. Sequential Visual Effects

Sequential visual effects are those where the viewer has to move through the landscape to see different projects. Sequential effects may occur *frequently* (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) or *occasionally* (long time lapses between appearances, because the observer is moving very slowly and/or there are large distances between the viewpoints).

The only routes from which the Proposal would be visible are the A18 and Holme Lane.

A journey on the A18 heading towards Scunthorpe would pass just outside the southern boundary of the CAS site for approximately 0.5km. Following a gap of approximately 1.3km of the route (equating to approximately half a minute's journey at 60 miles an hour), road users would pass just outside the northern boundary of the Land at Sweeting Thorns site. The boundaries of both sites with the A18 are dense hedgerows. Only glimpsed views of parts of either site would occur and it is possible that both or either development would go unnoticed by drivers in moving vehicles. This is especially the case where the sites are to the side of the direction of travel, and the development type is low-level compared to field boundaries and prominent landmarks such as the steelworks. This sequential effect would be *frequent* and of **low to medium** magnitude and **negligible/slight** significance for road users (LSRs).

For road users leaving the A18 and heading south on the B1398 before turning onto Holme Lane, the Land at Sweeting Thorns site would be passed approximately 1.5km after the CAS site. With a slower speed of travel, and having turned onto local roads, the sequential effect would not be more noticeable than that arising for users of the A18.

6. Conclusion

6.1. Landscape Effects

6.1.1. Effects on On-site Landscape Features

The Proposal would involve the removal of in total approximately 10m of fencing on the site boundaries. There would be no loss of hedgerows or trees. 35ha of arable land and 2.5ha of brownfield land would be replaced with the solar PV development. The overall effect on landscape features would be of **moderate to moderate/major adverse** significance.

Section 4.2 details effects on on-site landscape features.

6.1.2. Effects on Landscape Character

The proposed development would be situated on the boundary of the *Open Undulating Farmland* and *Wooded Scarp Slope* LCTs. Locating a solar PV development in this landscape would introduce a modern low-level engineered element into a medium-scale gently undulating landscape. The solar PV development would be a contrasting element in the context of the arable/woodland landcover. As a development which contains strongly linear elements, the Proposal would relate well to the relatively flat topography and rectilinear field pattern of the *Open Undulating Farmland* LCT. Locally, the development would abut woodland to the east extending north and south and merging into the *Wooded Scarp Slope* LCT of the Lincolnshire Edge escarpment.

Within approximately 0.2 to 0.4km of the proposed development, the landscape character effects during construction and on completion would be of up to **moderate/major adverse** significance.

In the long-term, the landscape mitigation which forms part of the Proposal would mature, reducing the effects on landscape character. The long-term effects within approximately 0.2 to 0.4km of the site would be of **moderate adverse** significance.

Beyond approximately 0.5km, long-term effects on landscape character would be of **negligible adverse** significance.

The overall long-term effect on the character of the *Lincolnshire Edge* LCA would be **negligible**.

Section 4.3 details effects on landscape character.

6.2. Visual Effects

The LCTs which make up the site and surrounding area generally restrict views to the site. The wooded escarpment to the east of the site restricts views from the east from the *Wooded Scarp Slope* and *Heathy Woodland* LCTs. Industrial, retail and residential areas to the north and west restrict views towards the site within the *Industrial Landscape* and *Urban Area* LCTs. Within the *Open Undulating Farmland* and *Wooded Undulating Farmland* LCTs to the south and south-west, views across the landscape are restricted by patches of woodland, field boundary hedgerows with trees, or by the undulating topography. The landscape context is such that there would not be widespread views of the Proposal from the surrounding area.

Section 4.4 details potential visual effects. The following sections summarise effects for the main visual receptor groups.

6.2.1. Settlements/Residential Areas

For residents of Mendle Farmhouse (40m from the south-west corner of the site), filtered views of the development would be possible from east-facing windows and outside areas. Effects for residents (high sensitivity receptors (HSRs)) during construction and on completion would be **moderate/major adverse**. In the long-term, the proposed 2m high planted bund in the south-western corner of the site would screen views for residents of Mendle Farmhouse from ground level. It is probable, however, that there would continue to be views from first floor east-facing windows, particularly during winter months. Long-term visual effects for residents of Mendle Farmhouse would reduce to **moderate to moderate/major adverse** significance.

For residential receptors, no other *likely significant* effects receptors would arise. Houses further to west of Mendle Farm on Holme Lane, and houses to the east of the site on Holme Lane, would have no views of the Proposal due to field boundary vegetation.

6.2.2. Public Rights of Way/Recreational Landscape

There would be near views of the Proposal from the PROW (footpath number 211), which runs along the western boundary of the site for approximately 1.3km. Effects of **high** magnitude and **moderate/major adverse** significance would arise on completion. Effects on viewpoints on this footpath would not be mitigated by proposed landscaping measures due to the proximity of the development. Effects at year 15 would remain at **moderate/major adverse** significance.

No significant effects are predicted for users of other PROWs or recreational areas in the study area.

6.2.3. Transport Network

The A18 would provide access to the site and is the principal route from which the Proposal would be visible. During construction and on completion, **medium to high** magnitude effects of **slight to moderate adverse** significance would arise for users of the A18 (LSRs). In the long-term, as landscaping mitigation measures establish, the effect would reduce to **medium** magnitude and **slight adverse** significance.

Users of Holme Lane, which runs outside the site's southern boundary, would have glimpsed views through field gateways in the south-eastern and south-western corners of the site (*viewpoints 1 and 2*). A **high** magnitude effect of **moderate adverse** significance would arise during construction and on completion for users of Holme Lane. As landscaping mitigation measures mature, by year 15 effects would reduce to **medium** magnitude and **slight adverse** significance.

No significant effects are predicted for road users in the study area.

6.3. Effects on Designated Landscapes

Indirect effects on landscape character within the *Wooded Scarp Slope* LCT, which makes up the western edge of the AHLV near the site, would be of **medium** magnitude and **moderate adverse** significance on completion. In the long-term as landscape mitigation measures mature, effects would reduce to **low to medium** magnitude and **slight to moderate adverse** significance. Effects would not be noticeable beyond approximately 0.2km from the site.

No significant adverse visual effects would arise on completion or in the long-term on the adjacent AHLV to the east of the site.

6.4. Cumulative Effects

The only cumulative scheme in the locality is the consented 38MW/83ha Raventhorpe Farm project (North Lincolnshire reference PA/2014/0892). The Raventhorpe Farm project is at its nearest between 1km and 2km to the east of the Land at Sweeting Thorns site.

Were both projects to be installed, the overall cumulative landscape character effect on the *Lincolnshire Edge* LCA would be of **slight** significance.

The landscapes surrounding the Land at Sweeting Thorns and Raventhorpe Farm sites contain dense woodland and field boundary vegetation which can screen long-distance views. The two sites would also be separated by the scarp slope, which also restricts inter-visibility.

No *likely significant* combined visual effects would arise for the CAS and the Proposal.

Both schemes would be located within a 2km stretch of the A18. For users of the A18 (LSRs), this sequential effect could easily go unnoticed. The effect would be *frequent* and of **low to medium** magnitude and **negligible/slight** significance.

6.5. Residual Effects

6.5.1. Landscape Character Effects

On completion, the Proposal would bring about effects of **moderate/major adverse** significance on the host LCTs (*Open Undulating Farmland* and *Wooded Scarp Slope*).

In the long-term, as landscape mitigation matures, the Proposal would bring about effects of **moderate adverse** significance on the host LCTs (*Open Undulating Farmland* and *Wooded Scarp Slope*).

The Proposal would have no direct effects on landscape features such as hedgerows (**see Section 4.2**). The Proposal includes a landscape mitigation plan to improve the quality of existing boundary hedgerows, and to create new hedgerows and lowland meadow wildlife areas.

In the long-term, the landscape effects of the Proposal would be reversible. The Proposal would not change the existing field pattern or landform. In the long-term, removal of all elements of the Proposal, including solar panels, fencing, and buildings, would allow the existing arable land-cover to be reinstated.

6.5.2. Visual Effects

On completion, the Proposal would bring about visual effects of **moderate/major adverse** significance for residents of Mendle Farmhouse.

In the long-term, these effects would reduce to **moderate to moderate/major adverse** significance.

On completion and in the long-term, there would be effects of **moderate/major adverse** significance for users of the PROW which runs along the western boundary of the site (footpath number 211).

Appendix 1: Methodology

The assessment has been undertaken in accordance with the relevant guidance on landscape and visual assessment contained in the following publications:

- Landscape Institute and Institute of Environmental Management and Assessment (2013), *Guidelines for Landscape and Visual Impact Assessment 3rd Edition*[i].
- The Countryside Agency and Scottish Natural Heritage (2002), *Landscape Character Assessment – Guidance for England and Scotland.*[ii]

The Nature of Landscape and Visual Effects

Visual impact assessment considers the potential effects of a project on views and visual amenity. Landscape assessment looks at a project's likely effects on landscape features, designated landscapes and the character of the wider landscape.

Valency of Effects and Objective Assessment

Individual and cumulative landscape effects can be assessed objectively and quantitatively as either **adverse**, i.e. loss of valuable landscape elements, degradation of landscape character or loss of integrity in terms of designated landscapes, or **beneficial**, i.e. removal of inappropriate or damaging landscape elements, enhancement of key landscape elements and landscape character, or introduction of positive landscape elements. **Neutral** effects would occur where there is a balance of beneficial and adverse impacts.

Whether the landscape and visual effects of a proposed development are adverse, beneficial, or neutral is influenced by a variety of issues including personal preference, interests, and exposure to similar developments. This is perhaps particularly the case where the assessment is of a Proposal for which architectural and landscape design strategies have been progressed.

In accordance with the Landscape Institute and the Institute of Environmental Management and Assessment (2013)[i], this assessment determines whether landscape and visual effects are adverse, beneficial, or neutral, in conjunction with providing a statement on the sensitivity of receptors to the proposed development, the predicted magnitude of impact and significance of effect. With respect to effects being adverse or beneficial, it should be borne in mind that there will usually be a contrary opinion, which should be afforded due consideration and respect.

Notwithstanding the above, it is important to note that judgements in this LVIA are made

independently and with impartiality, and are based on professional experience and opinion, and informed by best practice guidance.

Direct and Indirect Effects

The landscape and visual resource of an area can be affected both directly and indirectly. Visual impacts are always direct because an object needs to be seen for a visual impact to arise. Landscape impacts on the other hand can be either direct or indirect. Change which affects onsite physical features (i.e. vegetation, buildings and landform), or the character area in which the site is located, is direct, whereas an impact on the character of surrounding LCAs is indirect. Indirect impacts are less significant than direct ones.

In general the scope of the LVIA is:

- Direct (primary) effects on landscape features, the character of the site, and views; and
- Indirect (secondary) effects on the surrounding landscape character.

Other factors to consider as part of the impact assessment process include:

- Sensitivity of the landscape and visual resource
- Magnitude of effects
- Significance of effects.

Assessment Timescales

In this assessment, potential effects are considered according to the following timescales:

- **During construction**: focussing on specific construction-related landscape and visual effects.
- **On completion**: the effects when the construction phase is complete and the operational phase of the project starts.
- **Long-term**, taken to be 15 years post completion: this timescale allows the assessment to consider effects once landscaping mitigation measures mature.

Assessment Criteria and Significance of Effects

Landscape and visual effects are determined by assessing the magnitude of impact against the sensitivity of the receptor. The **significance of an effect** is a function of **magnitude of**

landscape or visual effect and the **landscape or visual receptor's sensitivity** (see **Table A1.5**). Each of these three factors is determined by a combination of quantitative (objective) and qualitative (subjective) assessment using professional judgement.

Landscape Value

The value of an area of landscape can be defined by its importance at international, national, regional and local levels and is often reflected in the application of landscape policy and designations. A detailed assessment of the value of the landscape as perceived by the general public is beyond the scope of most LVIAs and therefore the assessment is based on landscape designations and character assessments. The following criteria illustrate the types of judgements made in assessing landscape value.

Table A1.1: Landscape Value

Value	Typical criteria	Typical scale	Typical examples
Exceptional	High importance (or quality) and rarity. No or limited potential for substitution.	International, National	World Heritage Site, National Park, Area of Outstanding Natural Beauty (AONB), Heritage Coast.
High	High importance (or quality) and rarity. Limited potential for substitution.	National, Regional, Local	National Park, AONB, Heritage Coast, Area of Great Landscape Value (AGLV)
Medium	Medium importance (or quality) and rarity. Limited potential for substitution.	Regional, Local	Undesignated, but value perhaps expressed through non-official publications or demonstrable use
Poor	Low importance (or quality) and rarity.	Local	Areas identified as having some redeeming features and possibly identified for improvement
Very Poor	Low importance (or quality) and rarity.	Local	Areas identified for recovery

Receptor Sensitivity

Landscape Receptors

The sensitivity of landscape receptors can depend on:

- **Character**: what contribution does the site make to the character of the wider landscape in its undeveloped state? Is it part of a recognisable pattern of elements specific to the area? Does the site contribute to the area's sense of place and distinctiveness?
- **Quality**: what is the condition of the landscape?

- **Value**: is it valued by people, the local community or visitors? Are there special cultural associations, perhaps in relation to literature or art? Is the area covered by a landscape, ecological or historical designation? Is the landscape recognised locally, regionally or nationally?
- **Capacity**: what scope is there for change in the existing landscape character?
- **Susceptibility**: LI and IEMA (2013)[i] emphasize that the sensitivity of landscape receptors depends in particular upon the *susceptibility* of the receptor to the proposed change and the *value* attached to the landscape. Susceptibility can be defined as '*the ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences*'. Low susceptibility to change would therefore indicate a high ability to accommodate the specific proposed development without undue negative consequences. Low susceptibility would indicate a less vulnerable landscape more able to accommodate the Proposal with a low risk of harm. High susceptibility to change would indicate a low ability to accommodate the specific proposed development without undue negative consequences. High susceptibility would indicate a more vulnerable landscape less able to accommodate the Proposal with a low risk of harm.

In accordance with the LI and IEMA (2013), receptors are assessed on a case-by-case basis and the thinking in relation to judgements is recorded in the assessment. **Table A1.2** illustrates the judgements made in assessing landscape receptor sensitivity.

Table A1.2: Landscape Sensitivity

High	A quality landscape with valued features and of positive character, which is particularly susceptible to the proposed change. A landscape of importance or rarity on a regional, national or international scale. Minor changes cannot be accommodated without impact on value and/or loss of character or no more than minor changes can be compensated by replacement or substitution.
Medium	A landscape of generally positive character but there may have been degradation or erosion of features resulting in areas of more mixed character or reduced overall value. A landscape of medium importance or rarity on a regional or local scale. A landscape of moderate susceptibility to the proposed change in which minor to moderate change may be tolerated although this may be detrimental if inappropriately dealt with. Minor changes can be accommodated without impact on value and/or loss of character or moderate changes can be reduced or eliminated by replacement or substitution and/or are beneficial to value and character.
Low	A landscape of few valued features which has a low susceptibility to the proposed change. An area of low importance and rarity at a local scale. Moderate changes can be accommodated without impact on value and/or loss of character or substantial changes can be reduced or eliminated by replacement or substitution and/or are beneficial to value and character.

Visual Receptors

The sensitivity of visual receptors can depend on:

- Their distance from the proposed development
- The nature of the development and its size
- The angle, elevation and context of the viewpoint
- The activity of the receptor and the expectation of the view this brings
- The importance of the view with respect to the number of people affected
- The popularity of the view – whether it appeals to locals, visitors, or whether it is cited in books, guides and maps
- Their susceptibility to change, which is mainly a function of the occupation or activity of people experiencing the view, and the extent to which their attention or interest may be focussed on the view.

In accordance with LI and IEMA (2013), receptors, or groups of receptors are assessed on a case-by-case basis and the thinking in relation to judgements is recorded in the assessment. **Table A1.3** illustrates the judgements made in assessing visual receptor sensitivity.

Table A1.3: Visual Receptor Sensitivity

High	Viewpoints in a high value landscape, recognised in published maps or guides (e.g., visitors to nationally designated areas of public and private open space – National Parks, AONBs, Heritage Coasts, etc.). Views from residential properties or communities where views contribute to the landscape setting enjoyed by residents. Receptors who are engaged in leisure activities intrinsic to which is an appreciation of the landscape or surroundings, for example users of national trails, long-distance paths or local footpaths through high-valued landscapes. Visitors to heritage assets or other important attractions where views are important to the experience. Receptors who would have a high susceptibility to the proposed development.
Medium	Viewpoints in a medium value landscape (e.g., visitors to locally designated areas of public and private open space – AGLVs or Country Parks, etc.). Individuals who have a moderate interest in their surroundings whilst working or engaged in leisure activities, for example those engaged in outdoor sports such as fishing or golf, or using local footpaths through moderately valued landscapes, or users of local roads designated as National Cycle Routes or national trails. Travellers on road, rail or other routes may fall into an intermediate category depending on whether travel involves appreciation of the landscape. Receptors who would have a medium susceptibility to the proposed development.
Low	Viewpoints in a low value landscape. People involved in outdoor sport or recreation not involving appreciation of views in the landscape. People at places of work where landscape setting is not important to quality of working life. Individuals who have a transient interest in the surrounding landscape whilst engaged in other

	activities, for example while working or travelling through an area on an occasional basis (e.g., users of major roads, employees of businesses and industry, users of local rights of way associated with highways or local routes whose primary function is access between two places). Receptors who would have a low susceptibility to the proposed development.

Effect Magnitude

The magnitude of effect of a particular proposal on landscape and visual receptors will depend on a number of factors including:

- The nature of the proposed development compared with existing context – the loss of key elements of the pre-development landscape or view
- The introduction of elements into the receiving landscape or the alteration of the overall composition of the view and the extent to which the scale, massing, layout and colour of materials contrast with the pre-development situation
- The perceived change compared with the existing situation
- The duration and reversibility of change
- The number of observers affected and their distance from the development.

Table A1.4 illustrates the judgements made when assessing the magnitude of landscape and visual effects.

Table A1.4: Magnitude of Effect

	Magnitude of Effect	
	Landscape	**Visual**
	The magnitude of change in relation to ***physical elements and/or landscape character****:*	*The magnitude of change in relation to* ***views and/or visual amenity as generally perceived by observers*** *– this is related to the degree of landscape impact magnitude:*
Negligible	Indiscernible or barely discernible change - project components would tend to go unnoticed in the wider landscape.	Indiscernible or barely perceptible change - project components would tend to go unnoticed in views.
Very Low	Very low levels of change – project components would generally be perceived as a background element in the wider landscape.	Very low levels of change - project components would be a background element in views and would very easily go unnoticed.
Low	Low levels of change - project components would be present in the landscape but would generally be perceived as a background component of the wider landscape.	Low levels of change to views - project components would be present in the landscape but as a background component of views and would easily go unnoticed.
Medium	Medium levels of change – project components would be relatively prominent in the landscape but would generally appear subservient to, or in equilibrium with, the prevailing landscape characteristics.	Medium levels of change to views - project components would be relatively prominent but generally subservient, or in equilibrium with, the prevailing landscape characteristics, and would easily be noticed.

	Magnitude of Effect	
	Landscape	**Visual**
High	High levels of change – project components would be prominent in the landscape and would generally be perceived as a determining factor of local character.	High levels of change to views - project components would be prominent, perceived as a determining factor in views, and would be difficult not to notice.
Very High	Very high levels of change – project components are very prominent in the landscape and are the determining factor of local character.	Very high levels of change to views – project components would be very prominent, perceived as the determining factor in views, and would be extremely difficult not to notice.

Significance of Landscape and Visual Effects

LI and IEMA (2013) emphasize that the significance of each potential effect on landscape and visual receptors should be judged on a case-by-case basis.

Significance of Landscape Effects

Circumstances will vary with the location, landscape context and the type of proposal. The spectrum of the significance of landscape effects can be illustrated by these extremes:

Likely to be most significant	Major loss or irreversible negative effects, over an extensive area, on elements and/or aesthetic and perceptual aspects that are key to the character of nationally valued landscapes
Likely to be least significant	Reversible negative effects of short duration, over a restricted area on elements and/or aesthetic and perceptual aspects that contribute to but are not key characteristics of landscapes of community value

Significance of Visual Effects

More likely to be significant	Effects on people who are particularly sensitive to changes in views and visual amenity
	Effects on people at recognised and important viewpoints or from recognised scenic routes
	Large-scale changes which introduce new, uncharacteristic or discordant or intrusive elements
Less likely to be significant	Effects on people who are less sensitive to changes in views and visual amenity
	Effects on people at local incidental viewpoints, or from local routes, the primary purpose of which is to connect two places
	Small-scale changes which introduce forms which are already present and characteristic, or unobtrusive elements

Significance Matrix and Significance Criteria for Landscape and Visual Effects

The significance of an effect is a function of the **magnitude of landscape or visual effect** and the **landscape or visual receptor's sensitivity**, as illustrated by **Table A1.5** with judgements made on a case-by-case basis as to how sensitivity and magnitude combine to influence significance. **Table A1.6** illustrates the spectrum of criteria which are applied to decisions about significance. The assessor will make informed decisions to adjust the level of significance where

appropriate.

Effects of moderate/major or major significance (shaded grey in **Tables A1.5** and **A1.6**) would potentially be considered to be **significant** in an EIA context (EIA Regulations, 1999). This assessment is for non-EIA development. Effects of moderate/major or major significance are identified as 'significant' in that they are *the principal landscape or visual effects of the Proposal*: this is the definition of 'significant' adhered to in this report.

Table A1.5: Significance Matrix

Magnitude	**Sensitivity**		
	High	**Medium**	**Low**
Very High	Major	Major	Moderate/Major
High	Major	Moderate/Major	Moderate
Medium	Moderate/Major	Moderate	Slight
Low	Moderate	Slight	Negligible/Slight
Very Low	Slight	Negligible/Slight	Negligible
Negligible	Negligible/Slight	Negligible	Negligible

Table A1.6: Significance Criteria

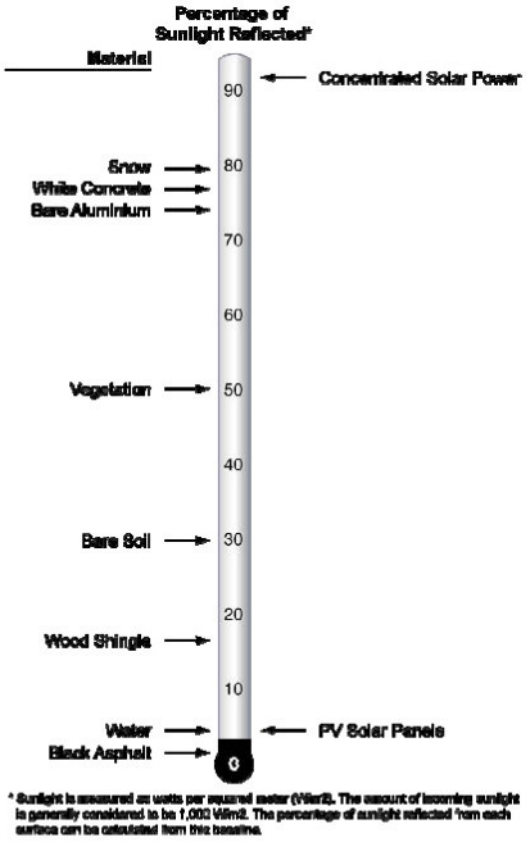
Significance of Effect	**Landscape Resource**	**Visual Resource / Amenity**
Major	Changes would be sufficiently large or uncharacteristic to substantially alter a nationally important landscape feature/valued aspect of landscape.	Changes would be sufficiently uncharacteristic or intrusive to substantially alter a nationally important view, or view of high scenic quality.
Moderate/ Major	Changes would be noticeably out of scale with the underlying character of an area or substantially alter a locally important landscape feature/valued aspect of landscape.	Changes to views would be noticeably out of scale with the existing view and/or substantially alter a locally important view, or view of scenic quality.
Moderate	Changes would be apparent and out of scale with the underlying character of an area or noticeably alter a landscape feature or aspect of landscape.	Changes to views would be apparent and out of scale with the existing view or noticeably alter a view.
Slight	Changes would be apparent but intermittent and at slight variance with the underlying character of an area and its landscape features.	Changes to views would be apparent but intermittent and at slight variance with the existing view.
Negligible/slight	Changes would have a barely discernible effect on the character of an area and its landscape features.	Changes would have a barely discernible effect on views/visual amenity.
Negligible	Changes would have an indiscernible effect on the character of an area and its landscape features.	Changes would have an indiscernible effect on views/visual amenity.
None	No effect.	No effect.

Glint and Glare

There is a perceived issue of glint and glare surrounding the reflectivity of solar PV panels and potential consequences such as distractions to motorists, aircraft and other sensitive receptors. Poly-Crystalline Solar Panels, the most commonly used type, are designed to absorb the sun's energy and directly convert it to electricity (not to reflect it). PV modules of this type absorb approximately 82 to 90 per cent of the light received.

The level of glare and reflectivity from solar PV panels is considerably lower than the level of glare and reflectance of common land or other surfaces (see **Figure A1.1**). PV panels reflect only approximately 10 to 18 per cent of energy which is less than typical rural environments which have a reflectivity of approximately 15 to 30 per cent. Solar PV panels have the same or less glint and glare than a white concrete or bare soil. If glare is considered a particular issue at this site then a separate glint and glare assessment should be carried out as it is not within the scope of this report to cover the subject in detail.

Figure A1.1: Reflectivity Produced by Different Surfaces (from Federal Aviation Administration, 2010)[v]



Methodology for ZTVs

The bareground ZTV (**Figures 1176/03a** and **03b**) was prepared using GRASS modules within gvSIG. A digital elevation model of the study area was prepared using OS Terrain 5 data. The digital elevation model was modified to take account of earth curvature and light refraction using the GRASS *r.ecurv.comp* module. ZTV maps were prepared using the modified terrain model and the *r.cva* script. Eight reference points 3.0m above existing ground level on the proposed development site were selected at random. Viewer height was assumed to be 2.0m.

The ZTVs discussed in this report are, unless otherwise stated, bareground ZTVs and do not take account of the screening effects of local vegetation or the built environment. They present a worst-case scenario of visibility of the Proposal. The following should be borne in mind when interpreting the information presented in the ZTVs:

1. Areas shown as having no visibility will have no visibility.
2. Only areas shown as having theoretical visibility may have visibility of the development, however, local features such as trees, hedgerows, embankments or buildings could screen views. Where settlements are shown as lying within areas of visibility, it is only likely to be the edges of the settlements which would theoretically have views to the proposed development.
3. Only randomised reference points at 2.9m above existing ground level on the site have been modelled, so these may be the only parts of the proposed development which are visible. Near the edges of areas of theoretical visibility, it is more likely that only these highest points on the development would be visible.
4. The ZTV is shown to 5km from the reference points. Potential visual effects tend to reduce with distance.
5. The ZTV is based on OS Terrain 5 data, which includes detailed modelling of significant features such as roads, railways, quarries and lakes. Root mean square error varies between 1.5m in urban areas and along major communication routes, to 2.5m in rural, mountain and moorland areas.
6. This ZTV is one of a number of tools used in visual assessment. It gives a worst-case illustration of the theoretical visibility of the Proposal. Viewpoint photographs indicate the characteristics of the local landscape and how these may affect views (**Figure**

1176/05).

Methodology for Photography

Photographs were taken using a Canon 5d mkiii digital SLR with a 35mm x 24mm (full frame) CMOS sensor. A Canon EF 50mm f/1.8 II normal lens was used. The camera was mounted on a stable tripod at 1.6m height. The tripod was levelled using a three-way levelling plate with built-in spirit level. A hand-held spirit level was placed on the front of the lens to double check the camera was level. The tripod was equipped with a 360 degree panoramic head, with the interval between shots set at 20 degrees (landscape orientation) or 15 degrees (portrait orientation). The head was adjusted to the nodal point of the lens. Photographs were taken with maximum depth of field. An indicative co-ordinate was taken at each camera point using a mobile phone using GPS Essentials Software.

Camera RAW data images were stitched together using Abobe Photoshop CS6 software. Settings were adjusted for the specific lens and images were stitched using a cylindrical projection. 70 degree HFV images were produced for use in photographs of existing views.

Appendix 2: Policy Context and Additional Baseline Information

National Planning Policy

National Planning Policy Framework (NPPF)[vi] was published on 27th March 2012. At the heart of the NPPF is a presumption in favour of sustainable development unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the NPPF taken as a whole, or where specific policies indicate development should be restricted (paragraph 14). The 12 Core Planning Principles of the NPPF include:

- Conserving and enhancing the natural environment and reducing pollution; and
- Recognising the intrinsic character and beauty of the countryside and supporting rural communities within it.

Planning Practice Guidance for Renewable and Low Carbon Energy

Planning Practice Guidance for Renewable and Low Carbon Energy[vii], provides guidance to Local Authorities on the matters to consider when determining applications for large-scale solar parks. Such matters include visual impacts on the local landscape and the enhancement of the local character with native screen planting. Each of these matters is addressed within the report.

Planning for Renewable Energy Development[viii]

This Supplementary Planning Document sets out North Lincolnshire Council's approach to planning for renewable energy developments and to provide guidance for developers in preparing associated planning applications.

North Lincolnshire Local Plan (Saved policies September 2007)[ix]

Policy LC7 - Landscape Protection:

"*Where development is permitted within rural settlements or within the open countryside, special attention will be given to the protection of all scenic quality and distinctive local character of the landscape. Development which does not respect the character of the local landscape will not be permitted."*

The local character of the landscape has been fully considered in this assessment with a number of mitigation measures recommended.

LC11 - Areas of Amenity Importance:

"Within important amenity areas, development will only be permitted where it would not adversely affect

their open character, visual amenity or wildlife value or compromise the gap between conflicting land uses. Where development is permitted, measures shall be to minimise their impact or where necessary, make a positive contribution to such areas."

This assessment demonstrates that the proposed development would not adversely affect the open character or visual amenity of the site. The wildlife value of the site is considered in the Ecology Assessments submitted with the planning application.

Policy LC15 - Landscape Enhancement:

"The following landscape enhancement schemes are proposed:

Scunthorpe and Bottesford Urban Areas

1. North West Escarpment

2. Conesby Quarry/Sawcliffe

3. Bottesford Beck…"

Bottesford Beck, which is designated by the Environment Agency (EA) as a 'water framework directive sensitive area' along its uppermost section, rises at the north-west corner of the application site and flows south along the site's western boundary before turning west. This watercourse separates the site from the wetland to the north-west which has been designated a Local Nature Reserve (LNR).

Policy DS21 - Renewable Energy:

"Proposals for the generation of energy from renewable resources will be permitted provided that:

1. any detrimental effect on features and interests of acknowledged importance, including local landscape character and amenity, is outweighed by environmental benefits; and

2. proposals include details of associated development including access roads and other ancillary buildings and their likely impact upon the environment.

Where appropriate, conditions will be imposed requiring the restoration of the site to its original condition or the implementation of an agreed scheme of after-use and restoration."

North Lincolnshire Core Strategy (Adopted June 2011)

Policy CS18 - Sustainable Resource Use and Climate Change:

This is key policy within the adopted Core Strategy document of relevance to this development proposal. This policy aims to reduce the size of North Lincolnshire's ecological footprint, reduce

the causes of climate change, and move North Lincolnshire towards a more resource efficient future.

National Character Area 45: Northern Lincolnshire Edge with Coversands

The key characteristics of the host NCA are as follows:

- *'Elevated arable landscape with a distinct limestone cliff running north–south, the scarp slope providing extensive long views out to the west.*
- *Double scarp around Scunthorpe of ironstone, and extensive areas of wind-blown sand, the Coversands, giving rise to infertile soils supporting heathland, acid grassland and oak/birch woodlands, with rare species such as woodlark and grayling butterfly.*
- *Underlying limestone supporting small areas of calcareous grassland.*
- *Few watercourses on the plateau, which lies between the rivers Trent and Ancholme which flow into the Humber, and is cut through in the south by the River Witham.*
- *Productive soils on limestone plateau giving rise to a large-scale landscape of arable cultivation with extensive rectilinear fields and few boundaries of clipped hedges or rubble limestone, supporting birds such as grey partridge and corn bunting.*
- *Semi-natural habitats of acid and calcareous grassland and broadleaved woodland are small and fragmented, and often associated with disused quarries.*
- *Limited woodland cover, with patches of both broadleaves and conifers associated with infertile sandy soils, elsewhere occasional shelterbelts.*
- *Long, straight roads and tracks, often with wide verges; Ermine Street follows the route of a key Roman north–south route.*
- *Nucleated medieval settlement patterns following major routes, especially Ermine Street; sparse on higher land, with springline villages along the foot of the Cliff and some estates and parklands.*
- *Other development comprises the major settlements of Lincoln and Scunthorpe, with their prominent landmarks of the cathedral and steelworks, and several active and re-used airfields prominent on the ridgetop.*
- *Vernacular architecture and walling, especially in villages, of local warm-coloured limestone with dark brown pantiles.*
- *Several ground features, especially on the plateau, include prehistoric burial mounds, Roman artefacts and abandoned medieval villages.'*

Appendix 3: Abbreviations

AHLV	Area of High Landscape Value
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
CAS	Cumulative Assessment Scheme
EA	Environment Agency
EIA	Environmental Impact Assessment
GIS	Geographic Information System
HFV	Horizontal Field of View
HLC	Historic Landscape Character
HSR	High Sensitivity Receptor
LCA	Landscape Character Area
LCT	Landscape Character Type
LNR	Local Nature Reserve
LSR	Low Sensitivity Receptor
LVIA	Landscape and Visual Impact Assessment
NCA	National Character Area
NLC	North Lincolnshire Council
NPPF	National Planning Policy Framework
PROW	Public Right of Way
PV	Photovoltaic
SAM	Scheduled Ancient Monument
ZTV	Zone of Theoretical Visibility

Appendix 4: Figures

Figure 1176/01a: Topography and Landscape Character Areas

Figure 1176/01b: Landscape Character Types

Figure 1176/02: Cultural Heritage and Access

Figure 1176/03a: Zone of Theoretical Visibility of Solar Array (1:50,000 basemap)

Figure 1176/03b: Zone of Theoretical Visibility of Solar Array (1:25,000 basemap)

Figure 1176/04: Assessment Viewpoints

Figures 1176/05.01 to 1176/05.11: Assessment Viewpoint Photographs

Figure 1176/06: Site Layout and Planting Proposals

Figure 1176/07: Raventhorpe Farm Cumulative Scheme

Appendix 5: References

[i] Landscape Institute and Institute of Environmental Management and Assessment (2013), *Guidelines for Landscape and Visual Impact Assessment: Third Edition.*

[ii] The Countryside Agency and Scottish Natural Heritage (2002), *Landscape Character Assessment – Guidance for England and Scotland.*

[iii] Countryside Agency (2002), *Countryside Character, Volume 3: Yorkshire and the Humber – the Character of England's Natural and Man-made Landscape.*

[iv] North Lincolnshire Council, (1999), *North Lincolnshire Landscape Character Assessment & Guidelines.*

[v] Federal Aviation Administration, 2010. *Technical Guidance for Evaluating Selected Solar Technologies on Airports.*

[vi] Department for Communities and Local Government (2012), *National Planning Policy Framework.*

[vii] Department for Communities and Local Government (2013), *Planning Practice Guidance for Renewable and Low Carbon Energy.*

[viii] North Lincolnshire Council (November 2011), *Planning for Renewable Energy Development.*

[ix] North Lincolnshire Council (adopted May 2003/saved policies September 2007), *North Lincolnshire Local Plan.*