Landscape and Visual Appraisal

UKZ157, TYDD SOLAR FARM

BRIARWOOD LANDSCAPE ARCHITECTURE | PATHFINDER CLEAN ENERGY UKDEV LIMITED

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1. Introduction

1.1 This Landscape and Visual Appraisal (LVA) has been prepared by Briarwood Landscape Architecture by a Chartered Member of the Landscape Institute, on behalf of Pathfinder Clean Energy UKDev Limited in respect of a proposed solar farm at Land east of Guanockgate Road, Gorefield ('the site'). The site straddles the boundary between the districts of South Holland and Fenland District.

1.2 The proposed development, known as Tydd Solar Farm, is described as, "Temporary ground mounted solar photovoltaic (PV) farm with battery storage along with continued agricultural use, ancillary infrastructure and security fencing, landscaping provision, ecological enhancements and associated works."

1.3 The location of the proposed development is shown on the Site Location Plan at Appendix 1. The centre of the site is located at approximate grid coordinates TF 38331 12780.

Appendix 1 – Site Location Plan

1.4 The LVA considers the potential effects of the proposed development on:

- Landscape elements and features such as vegetation, topography and water bodies etc.,
- Landscape character and,
- Visual amenity

1.5 The primary objectives of the LVA are as follows:

- To identify, describe and evaluate the current landscape character of the site and its surrounding area
- To identify, describe and evaluate any notable individual landscape elements and/or features within the site
- To determine the sensitivity of the landscape to the type of development proposed
- To identify potential visual receptors (i.e. people who would be able to view the proposed development) and to evaluate their sensitivity to the type of changes proposed

- To identify and describe any effects of the proposed development in so far as they affect the landscape and/or views and to evaluate the magnitude of change owing to those effects

1.6 The visual assessment was undertaken in autumn (22nd September 2022) with near complete leaf cover on the existing deciduous vegetation and with minimum visibility. Consideration has also been given to the effect on visibility with the vegetation having no leaf cover, with maximum visibility.

1.7 Where mention is made to heritage assets such as listed buildings, scheduled ancient monuments etc. then this is done only in the context of such assets being features of the landscape. A formal archaeological/heritage assessment has been undertaken and reference should be made to this report in respect of such matters.

2. Methodology

Guidance

2.1 This LVA has been undertaken with regard to the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment (3rd Edition) – Landscape Institute/Institute of Environmental Management and Assessment (IEMA).

2.2 A detailed methodology is given in Appendix 2. As recommended within the published guidance, landscape (elements and character) and visual effects are assessed separately.

Appendix 2 – Detailed Methodology

Nature of Effects

2.3 The nature of effects on landscape, character and visual amenity can be neutral, adverse or beneficial. Neutral effects are those that would maintain, on balance, the existing integrity, quality or key characteristics of a landscape or view.

2.4 For the purposes of this assessment, unless otherwise stated, any change to the landscape and visual amenity as a result of the proposed development is considered to be permanent and non-reversible and adverse in nature.

Assessment Period

2.5 Operational effects are assessed at years 1 and 10 so as to take into account any mitigation measures such as new planting etc. Unless expressly stated otherwise, the effect, and the nature of the effect, at year 10 is considered to be the same as year 1.

Iterative Process

2.6 As advocated in GLIVA3 the assessment process has been an iterative one. This revision of the LVA has been prepared in response to changes in the layout of the proposed development since issuing of the initial LVA report. The layout has been amended following pre-consultation advice.

Photography and Photoviews

2.7 Photographs used as part of the detailed visual assessment have been taken using a Canon E05 Mark III, full frame sensor, digital camera with a 50mm lens. The lens has a standard focal length and is considered to best represent the human eye.

2.8 Photography took place in sunny weather, with good visibility, on the 22nd September 2022. The camera was at a height of approximately 1.6 metres.

2.9 The Photoviews used for the visual assessment are presented at A3 size as single shots or at A1 (printable size) for panoramic views in accordance with the Landscape Institute Technical Guidance Note (TGN) 0/19 Visualisations of development.

Preparation of Photomontages and Visuals Methodology

Production of 3D Model and Environment

2.10 Plans and elevations for the proposed infrastructure were supplied in PDF and DWG format, and were used to build the relevant 3D models to create the site proposals. A topographical survey and Nextmap 2m contours were used to create the digital terrain model (DTM). This DTM was used as the basis on which to build the site layout. The relevant infrastructure and planting proposals were then aligned to the DTM using the supplied layout plan.

Stitching of Panoramic Photography

2.11 The site photography was supplied in both jpg and RAW format. The relevant images were selected and edited in Adobe Photoshop to adjust the levels and exposure where necessary. These images were then stitched together using PTGui version 12.8. This software allows the production of accurate panoramas, whilst reducing the effects of distortion. The images were aligned and the control points adjusted where necessary. The resulting panoramas were fixed to a horizontal field of view (HFoV) of 75 degrees, which provides sufficient context whilst minimizing distortion within a cylindrical projection.

Photographic Alignment within the 3d Environment

2.12 A variety of data sources have been used to align the development proposals to the existing photography. This includes:

- The supplied topographical survey

- DEFRA 1m LIDAR DSM point cloud

2.13 The 3d model and point cloud data are combined into one 3d file, the whole model is then imported to 3DS Max, a 3d visualisation software.

2.14 A virtual camera was created within 3ds Max using the surveyed camera location, recorded target point and field of view (FOV) based on the camera and lens combination selected for the shot .

2.15 The baseline photograph was attached as a background to this view, to assist the Visualiser in aligning the point cloud to each corresponding background point, based on the Camera Matching Technique.

2.16 At this stage a 2nd member of the visualisation team cross-checked the camera alignment to verify the view was correctly set.

2.17 Using this virtual camera, a render was created of the aligned model at a resolution to match the baseline photograph. This was overlaid onto the baseline photograph to assess the accuracy of the alignment. When using a wide-angle lens, observations outside the circle of distortion are given less weighting.

Final Rendering and Post-Production

2.18 The photomontages were produced in line with Landscape Institute TGN 06/19: Visual Representation of Development Proposals. They were produced as Type 3 visuals.

2.19 The final renders were exported to the same resolution as the baseline photography. Multi pass renders are exported to give the visualiser more control in enhancements of the final image. These multi passes may include but not be limited to Reflections, Refractions, Shadows, Lighting, Ambient Occlusion and Global Illumination.

2.20 The multi pass renders are layered within Adobe Photoshop and blended together to produce the correct level of detail and photo-realistic feel. Finally masking is applied to the image. Endless aesthetic effects can be applied to the rendered image to enhance the realism of the final image and/or make adjustments as a result of proposed material changes. However, the visualiser always attempts to be faithful to the proposed design within its chosen site.

2.21 The final image is verified by a second visualiser to check the appearance, masking and form of the development.

2.22 The final photomontages are then saved in an appropriate format for inclusion within the relevant document.

Software Used

- AutoCAD
- 3ds Max 2023
- V-Ray Next for 3ds Max
- Adobe Photoshop
- Adobe InDesign
- PTGui 12.8

Caveat

2.23 It is acknowledged that by virtue of carrying out the 'visual' element of this assessment, the author has an inherent 'bias' against the proposals to which this report relates. When carrying out the site visit and taking photos from the chosen viewpoint locations (from publicly accessible areas and vantage points), the report's author is actively and deliberately 'looking' for the 'site' within the local landscape.

2.24 In reality, visual receptors such as users of the public rights of way network and motorists alike will not 'actively' be 'looking' for the site (or the development) whilst traversing the public rights of way and road network. Whilst each visual receptor will have a varying degree of appreciation for their surroundings, depending on what they are doing (playing sport, walking, driving), their efforts will typically not be concerned with 'actively' and 'deliberately' looking for any given 'site' or 'residential development'.

2.25 The photoviews were accurate at the time they were taken. Site conditions can be subject to change, for example garden and field boundary hedgerows can be cut/trimmed by landowners/farmers, trees can be felled by landowners or blown over by adverse weather, and new trees can be planted. Therefore, the extent of visibility can potentially increase or decrease since the photoviews were taken. Such eventualities are not within the control of the report's author. The assessment of visibility within photoviews is accurate at the time of writing.

3. Baseline Context

Site Description

3.1 A series of context views helps to illustrate the nature of the site (see Appendix 3).

Appendix 3 – Context views

3.2 The site is geometric but irregular in shape (see Appendix 4 - Landscape Features Plan) and comprises of 16 fields plus a small woodland copse. The fields are referenced as A to I and T to Z respectively and, at the time of the initial site visit, were under arable production.

Appendix 4 – Landscape Features Plan

3.3 The boundaries are largely open, except for a short section in the north-east corner the site adjacent to Broad Drove West where the boundary is defined by hedgerow and a small woodland block. Elsewhere, the site is defined by a series drainage channels including Treading Bank to the south-east and Straight Reach Drain along the west.

3.4 Internally, the fields are also defined by drainage channels, which are typically straight linear features. The exception is the Lady Nunn's Old Eau, which is a more sinuous features and which bisects the site south to north.

3.5 Topographically, the site is flat. There is a gently rise from -1 metre Above Ordnance Datum (AOD) on the southern boundary to 1 metre AOD on the northern boundary.

Designations and Rights of Way

3.6 The site does not contain nor is it covered by any statutory or non-statutory landscape protection designation (see Appendix 5 – Designations).

Appendix 5 - Designations

3.7 The site is private but three public rights of way pass through it. These include:

- public footpath Tydd/4/1, which connects broadly west-east between Guanockgate Road and Elloe Bank ,
- Bridleway Tydd St Giles 13, which connects broadly north-south between Elloe Bank and Treading Bank and,

- Byway Tydd St Giles 19 which follows Treading Bank along part of the site's south-eastern boundary

Site context

3.8 The site is situated amongst other agricultural fields and forms part of the larger Tydd St Mary's Fen and Treading Field . The closest settlement is Sutton St Edmund, which is located approximately 1km to the west of the site boundary. The larger village of Gorefield is located approximately 2.5km to the east of the site boundary.

3.9 The more major North Level Main Drain runs as a straight feature through the landscape on a south-west-north-east axis approximately 300 metres from the site's south-east corner at its closest point. A high voltage electricity transmission line runs across the landscape and passes over the site running broadly parallel to the site's southern boundary.

3.10 A series of farmsteads and small clusters of residential properties are scattered in the landscape surrounding the site. The topography of the wider area remains broadly flat at or about 0 metres AOD.

Published Landscape Character Assessments

3.11 A hierarchy of national/regional, county and borough published landscape character assessments are available. These respective documents describe the host landscape of the site at an increasingly refined level. The published landscape assessments are intended to provide a foundation for understanding the key component elements and features that characterise the host landscape and potential the site itself.

Scale and Geographic Extent of the Proposed Development

3.12 In the context of its immediate surroundings, the site of the proposed solar farm is assessed as being of a 'medium' scale. The proposed development on the site will be extensive.

3.13 Attention is consequently focused on the host landscape described by the National/Regional and District published assessment at a finer grain than the whole of the particular character area. At the scale of a particular character area, the geographical extent of the proposed solar farm would, it is considered, have only a limited effect on character.

National Landscape Character Assessment

3.14 England is divided into 159 so called National Character Areas (NCA). The site is in NCA 46 The Fens (Appendix 6).

Appendix 6 – Extract from NCA 46 The Fens

3.15 The key characteristics of NCA 46 The Fens are identified by Natural England as being the following:

- "Expansive, flat, open, low-lying wetland landscape influenced by the Wash estuary, and offering extensive vistas to level horizons and huge skies throughout, provides a sense of rural remoteness and tranquillity.
- Jurassic clays are overlain by rich, fertile calcareous and silty soils over the coastal and central fens and by dark, friable fen peat further inland. The soils are important for agriculture, which is hugely significant for the rural economy in the Fens. There are over 4,000 farms in the Fens; enough wheat is grown here annually to produce a quarter of a million loaves of bread and one million tons of potatoes are grown here. In addition to traditional vegetables, exotics such as pak choi are now cultivated. Some 40 per cent of England's bulbs and flowers are also produced in the Fens.
- The Wash is the largest estuarine system in Britain, supporting internationally important intertidal and coastal habitats influenced by constant processes of accretion and deposition, forming salt marsh and mudflats and providing habitats for wildfowl, wading birds and other wildlife, including grey seals and approximately 90 per cent of the UK's common seals. It also provides important natural sea defences and plays a key role in climate change regulation. Flood storage areas on the Nene, Cam, Lark and Ouse washes also provide significant biodiversity interest. True fen mainly occurs at remnant conservation sites, such as Baston or Wicken Fen.
- Overall, woodland cover is sparse, notably a few small woodland blocks, occasional avenues alongside roads, isolated field trees and shelterbelts of poplar, willow and occasionally leylandii hedges around farmsteads, and numerous orchards around Wisbech. Various alders, notably grey alder, are also used in shelterbelts and roadside avenues.
- The predominant land use is arable – wheat, root crops, bulbs, vegetables and market gardening made possible by actively draining reclaimed land areas. Associated horticultural glasshouses are a significant feature. Beef cattle graze narrow enclosures along the banks of rivers and dykes and on parts of the salt marsh and sea banks.

- Open fields, bounded by a network of drains and the distinctive hierarchy of rivers (some embanked), have a strong influence on the geometric/rectilinear landscape pattern. The structures create local enclosure and a slightly raised landform, which is mirrored in the road network that largely follows the edges of the system of large fields. The drains and ditches are also an important ecological network important for invertebrates, fish including spined loach, and macrophytes.
- The area is very rich in geodiversity and archaeology, with sediments containing evidence for past environmental and climate changes and with high potential for well-preserved waterlogged site remains at the fen edge, within some of the infilled palaeo-rivers and beneath the peat.
- Large, built structures exhibit a strong vertical visual influence, such as the 83 m-high octagonal tower of 'Boston Stump' (St Botolph's Church), Ely Cathedral on the highest part of the Isle of Ely dominating its surrounding fen, wind farms and other modern large-scale industrial and agricultural buildings, while drainage and flood storage structures and embanked rail and road routes interrupt the horizontal fen plain.
- Settlements and isolated farmsteads are mostly located on the modestly elevated 'geological islands' and the low, sinuous roddon banks (infilled ancient watercourses within fens). Elsewhere, villages tend to be dispersed ribbon settlements along the main arterial routes through the settled fens, and scattered farms remain as relics of earlier agricultural settlements. Domestic architecture mostly dates from after 1750 and comprises a mix of late Georgian-style brick houses and 20thcentury bungalows."

3.16 It is considered, in reviewing the published assessment, that the site's host landscape within approximately 2km of the site boundary presents most of the key characteristics identified in the assessment document. The site is, however, remote from The Wash and the coast and there is a general absence of glass houses for crop production.

3.17 The site itself exhibits some of the key characteristics identified for NCA 46 The Fens. These are:

- Open geometric and rectilinear fields
- Paleo river
- Network of drains
- Arable land use
- Small woodland block.

3.18 Following a review of the published assessment, it is considered that the landscape character of the NCA 46 The Fens as it relates to the site and its environs has a medium value and a medium susceptibility to the type of solar development proposed. With a medium value and a medium susceptibility, the overall sensitivity of the landscape is assessed medium.

District Landscape Character Assessment

3.19 At the district level, Fenland District has no published landscape character assessment. Similarly, South Holland District Council has no specific published landscape character assessment document or online resource.

3.20 A Strategic Landscape Capacity Study[1] was prepared for South Holland in 2003 with particular reference to wind turbine development. However, the capacity study identified three landscape character types (LCT) across the district. The site of the proposed development is in the 'Peaty Fens' LCT.

3.21 The key characteristics of the Peaty Fens LCT are identified as:

- Flat landform
- Geometric/linear fields
- Linear settlement pattern
- Isolated farmsteads and associated tree belts

3.22 At the time of writing, the capacity study assessed the condition of the landscape as 'good'. It is noted that the capacity study is now nearly 20 years old.

Author's Own Assessment of Character

3.23 An assessment of the existing local landscape character up to 2 km from the site has been undertaken by the report's author. The author's assessment considers the site and its immediate surroundings and reviews the sensitivity and the capacity of the local landscape to accommodate the type and scale of development being proposed. The following criteria will be used:

- Landscape scale
- Landform and enclosure
- Landscape pattern and complexity

[1] John Campion Associates Ltd - Strategic Landscape Capacity Study for South Holland District Council – July 2003

- Settlement pattern and human influences
- Skylines
- Intervisibility
- Tranquillity

Landscape scale

3.24 Where the landscape surrounding the site remains predominantly agricultural in nature. The combination of a general level topography and typically open fields form a generally medium to large scale landscape.

Landscape and enclosure

3.25 The sense of enclosure in the landscape varies. Generally the landscape is open and there is little sense of enclosure. The sense of enclosure increases greatly where road and drainage embankments, tree belts and woodlands are present. These features together with the local landform curtail more distant views.

Landscape pattern and complexity

3.26 The pattern of the landscape within 2 km of the site is relatively simple. The pattern of the landscape is primarily geometric, with drainage channels, roads, woodland/tree belts and fields creating starkly linear forms. Agricultural fields are dominant with some orchards in the vicinity of Gorefield.

Settlement pattern and human influences

3.27 Settlement and human influences are conspicuous in the landscape. Small clusters of residential properties and individual farmsteads are scattered throughout the area. Larger settlements such as Sutton St Edmund are typically strongly linear in form. An overhead high voltage electricity transmission line with associated towers passes through the area and across part of the site. There are views of more distant wind turbines on the far horizon.

Skylines

3.28 Most skylines are extensive. Some views are foreshortened by the presence of built form and or tree belts/woodland.

Intervisibility

3.29 There is generally a strong level of intervisibility across the open areas of the landscape. Where vegetation occurs such as around farmsteads or along the edge of settlement etc, then the level of intervisibility is greatly reduced.

Tranquillity

3.30 Tranquillity is defined as being the absence of noise and activity. In this context, the landscape surrounding the site is relatively tranquil.

Baseline Visual Receptors

3.31 A visual assessment of the proposed development has been undertaken to determine how the proposals would have a bearing on the visual amenity of the surrounding landscape. This assessment was undertaken in September 2022, when leaf cover was still present on deciduous vegetation and visibility at a minimum.

3.32 In order to help make an assessment of the potential visual effects of the proposed solar farm development on the site, a screened Zone of Theoretical Visibility (SZTV) was been prepared based upon the initial site layout and potential site boundaries. Following refinement of the scheme, the SZTV was re-modelled (see Appendix 7).

Appendix 7 – Screened Zone of Theoretical Visibility (SZTV)

3.33 Based upon maximum height parameters, the SZTV shows from where in the landscape the proposed development would be theoretically visible. Using the SZTV and further desk top study, a series of initial representative views were selected on which to base a more detailed visual assessment. Subsequently a site visit has been made and the location and number of representative views has been refined.

3.34 The public highway and public right of way network surrounding the site, and within the SZTV, is relatively limited. The availability of public vantage points from which the proposed development would potentially be seen is similarly restricted.

3.35 A number of representative viewpoints have been identified on which to base a visual assessment . The detailed assessment of these representative viewpoints is given in section 8 (see also Appendix 8 - Representative Viewpoints). The location of the particular viewpoint is indicated on the individual display sheet.

Appendix 8 - Representative Viewpoints

Residential Properties

3.36 There are a number of residential properties in close proximity i.e. 500 metres or less of the site boundary. Of these, the majority are surrounded by belts of vegetation that restrict views of and into the site.

3.37 There is some intervisibility with the site from several properties with more open aspects. These residential properties are typically located to the east and south of the site boundary.

Public Highways

3.38 The greatest potential for intervisibility with the site, and the proposed development, would be from Guanockgate Road to the west of the site, from Elloe Bank to the north and south of the site, and from Harold's Bridge/Goredike Bank to the south. The open nature of these highways together with the open nature of the site, results in generally expansive views. Owing to the flat topography, and the typically level nature of the features on the site such as drainage channels, the site is difficult to distinguish in the wider landscape.

3.39 Elsewhere, views from the highway network, the views of and into the site are restricted through the orientation of the road, the presence of roadside and intervening vegetation and the presence of existing built form.

Public Rights of Way

3.40 The public right of way network – footpaths, bridleways and byways – in the local landscape containing the site is relatively limited. Three rights of way do, however, pass through the site. These rights of way afford views across large parts of the site. Notwithstanding this, the presence of the existing woodland copse, close to the centre of the site, acts as a screen to ensure that the whole of the site is not seen from one particular location.

Selection of representative viewpoints

3.41 A visual assessment has been undertaken of the study area. In line with the Guidelines for Landscape and Visual Impact Assessment (3rd Edition), a number of representative viewpoints (8 in total) have been selected to form the basis of a detailed visual assessment.

3.42 The chosen viewpoints are regarded as being representative of the range of potential views and receptors e.g. users of the public highway and public right of way networks,

etc. from various distances and directions around the site. A desk top study and field surveys has refined the number and exact location of the representative viewpoints so that their locations are ones from which there is anticipated to be an effect. The representative viewpoints are not intended to be exhaustive. A greater number of locations would have demonstrated no visual effect.

3.43 The following table summarises the overall sensitivity of the representative viewpoints.

Table 1 – Summary of viewpoint susceptibility, value and overall sensitivity

Viewpoint				
	Type of visual receptor	**Susceptibility**	**Value**	**Overall sensitivity**
Viewpoint 1 - View from Guanockgate Road	Users of the public highway network	Medium	Medium	Medium
Viewpoint 2- View from Honeyhill Farm	Users of the public highway network	Medium	Medium	Medium
Viewpoint 3 - View from Ashtree Farm	Users of the public highway network	Medium	Medium	Medium

Viewpoint				
	Type of visual receptor	**Susceptibility**	**Value**	**Overall sensitivity**
Viewpoint 4 – Goredike Bank and Turnover Road	Users of the public highway network	Medium	Medium	Medium
View 5 – View from Guanock House	Users of the public highway network	Medium	Medium	Medium
View 6 – View from Sutton St Edmunds	Users of the public highway network	Medium	Medium	Medium
Viewpoint 7 – View from Elloe Bank	Users of the public highway network	Medium	Medium	Medium
Viewpoint 8 – View from Treading Bank	Users of the public highway network	Medium	Medium	Medium

4. Proposed Development and Mitigation Measures

Description of the Proposed Development

4.1 The proposed development is for the, 'temporary ground mounted solar photovoltaic (PV) farm with battery storage along with continued agricultural use, ancillary infrastructure and security fencing, landscaping provision, ecological enhancements and associated works'.

4.2 A revised layout has been produced (see Appendix 9) upon which this full landscape and visual appraisal has been made. The proposals allow for fixed mounted panels (to a maximum 4 metres in height) to be arrayed across the site; arranged broadly east-west with the majority of panels facing south. The gaps between panels and rows will be grassed.

Appendix 9 – Proposed Site Layout (drawing UKZ157_09 Layout Plan – 17/11/2023)

4.3 The site would be protected by a security fence (approximately 2 metres in height) around its perimeter with gates to allow for maintenance access. The style of security fence will be a rural, 'deer fence', one with a timber post and mesh construction. The solar farm is intended to be unlit during hours of darkness. Post mounted CCTV cameras will be present at strategic points around the security perimeter site.

4.4 Both the security fence and the solar array will be contained within the existing retained field boundaries. Access into and through the proposed development would mainly use the existing farm tracks on the site. Additional tracks would be constructed internally to connect from the existing farm tracks to each of the remaining fields . With the exception of a short spur linking to the proposed substation, the proposed access tracks would follow the line of the existing drainage channels on site.

4.5 The proposed access tracks will be constructed of compacted MOT Type 2 graded stone. This will allow for the 'grassing over' of the track to reflect the frequency of maintenance visits and movement of vehicles.

Mitigation Measures

4.6 Mitigation measures to help minimise the potential impacts and effects have been incorporated into the distinct development stages of the proposed development, including:

- During the site selection process - by containing the proposed development within a discrete and well-defined area and by avoiding sensitive designations and areas;
- Through the design process - positioning the solar panels away from the edge of the site boundary to help minimise their visibility and to retain existing landscape features, using existing access points; and
- Incorporating additional mitigation measures - such as sensitive grassland management, retention of agricultural practices through the use of grazing, and planning for construction, operation and de-commissioning.

Mitigation through selection and siting of the proposed development

- The proposed development site was selected because of the absence of major environmental constraints including landscape protection designations, whilst taking into account commercial and technical considerations.
- The proposed development will not substantially disrupt the surrounding and established landscape pattern.
- The site has relatively few potential visual receptors in close proximity i.e. 500 metres or less to the site boundary.
- The proposed development is intended to fit into the existing landscape pattern so as to not be out of scale with the character of the local landscape so as to be accommodated successfully within the wider landscape.
- Any buildings or structures associated with the proposed development have been located so as to achieve a balance between operational requirements and restricting their wider visibility.
- As appropriate, the proposed built form would typically be of a dark recessive colour to minimise their influence.

Additional landscape mitigation measures incorporated into the proposed development design

4.7 Landscape relevant additional mitigation and enhancement measures incorporated into the proposed development design are shown on the Mitigation and Enhancement Plan (MEP) given at Appendix 10.

Appendix 10 - Mitigation and Enhancement Plan

4.8 These mitigation and enhancement measures include:

- Species rich grassland/biodiversity area covering proposed development that will be managed for biodiversity,
- New reedbed planting,
- New hedgerow planting,
- Creation of new woodland with understorey.

4.9 Mitigation measures, relevant to the LVA during the construction period, include:

- Minimising vegetation loss and allowing retained boundary vegetation to be maintained and managed at a taller height where appropriate;
- Limited access points,
- All temporarily disturbed and excavated areas will be reinstated following completion of construction activities

4.10 Mitigation measures, relevant to the LVA during the operation period, will include:

- All on-site cabling will be underground; and
- Existing entrances and tracks will be used where possible and new access points kept to a minimum so as to reduce direct effects on landscape elements.

4.11 It should be acknowledged that the operational effects of the proposed development are long-term given the 40-year operation period and the proposed development. Notwithstanding this, the operational effects would ultimately be temporary, and would be reversible. At the end of the operational period the proposed development would be dismantled and removed and the site reinstated to previous conditions.

4.12 Mitigation measures, relevant to the LVA during the de-commissioning period will be similar to the construction period, and will include:

- De-commissioning compound and all disturbed and excavated areas will be reinstated following completion of de-commissioning activities,
- Any concrete foundations (if used) and underground cabling will be broken up or left in situ and covered to make up levels;
- No vegetation loss;
- Existing entrances, tracks and access points will be used; and
- The site will be reinstated to previous use.

5. Planning Policy Context

National Planning Policy Framework (NPPF)

5.1 The latest iteration of the NPPF was published in September 2023 and superseded the previous version. The NPPF has a presumption in favour of sustainable development (paragraph 10). Specifically, paragraph 11 of the NPPF states that:

> "Plans and decisions should apply a presumption in favour of sustainable development. For plan-making this means that:
>
> a) all plans should promote a sustainable pattern of development that seeks to: meet the development needs of their area; align growth and infrastructure; improve the environment; mitigate climate change (including by making effective use of land in urban areas) and adapt to its effects;
>
> b) strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas6, unless:
>
> i. the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of development in the plan area; or
>
> ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole. For decision-taking this means:
>
> c) approving development proposals that accord with an up-to-date development plan without delay; or
>
> d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:
>
> i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or
>
> ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole."

5.2 Paragraph 8 of the NPPF defines the three dimensions to sustainable development. These dimensions are economic, social and environmental. In detail the environmental dimension is explained in the following terms:

> "an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy…"

5.3 Section 14 of the NPPF, 'Meeting the challenge of climate change, flooding and coastal change' specifically refers to renewable energy sources such as solar photovoltaic energy schemes. Particularly, paragraph 158 states:

> "When determining planning applications for renewable and low carbon development, local planning authorities should:
>
> a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and
>
> b) approve the application if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas."

5.4 Section 15 of the NPPF refers to 'Conserving and enhancing the natural environment'. Paragraph 174 states:

> "Planning policies and decisions should contribute to and enhance the natural and local environment by:
>
> a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
>
> b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
>
> c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."

5.5 Paragraph 175 of the NPPF states:

"Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries."

5.6 The first line of paragraph 176 expands on the requirements of paragraph 171 by saying:

"Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks. Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas."

Local Plan Policy.

5.7 The site is located across two local planning authorities – Fenland District and South Holland. In the Fenland Local Plan (adopted May 2014) the following policy is relevant to landscape and visual matters.

5.8 Policy LP16 - Delivering and Protecting High Quality Environments across the District states:

"High quality environments will be delivered and protected throughout the district. Proposals for all new development, including where appropriate advertisements and extensions and alterations to existing buildings, will only be permitted if it can be demonstrated that the proposal meets all of the following relevant criteria:

(a) protects and enhances any affected heritage assets and their settings to an extent commensurate with policy in the National Planning Policy Framework and in accordance with Policy LP18. (

b) protects and enhances biodiversity on and surrounding the proposal site, taking into account locally designated sites and the special protection given to internationally and nationally designated sites, in accordance with Policy LP19.

(c) retains and incorporates natural and historic features of the site such as trees, hedgerows, field patterns, drains and water bodies.

(d) makes a positive contribution to the local distinctiveness and character of the area, enhances its local setting, responds to and improves the character of the local built environment, provides resilience to climate change, reinforces local identity and does not adversely impact, either in design or scale terms, on the street scene, settlement pattern or the landscape character of the surrounding area.

(e) does not adversely impact on the amenity of neighbouring users such as noise, light pollution, loss of privacy and loss of light.

(f) provides adequate, well designed facilities for the storage, sorting and collection of waste that are user friendly and appropriate to the amount and type of development proposed (including taking account of any district or county Supplementary Planning Documents which are in force at the time of the proposal).

(g) provides publicly accessible open space for play, sport, recreation and access to nature, in accordance with the standards set out in Appendix B, or a financial contribution of equivalent value where on-site provision is impracticable.

(h) provides sufficient private amenity space, suitable to the type and amount of development proposed; for dwellings other than flats, as a guide and depending on the local character of the area, this means a minimum of a third of the plot curtilage should be set aside as private amenity space.

(i) provides well designed hard and soft landscaping incorporating sustainable drainage systems as appropriate.

(j) provides safe environments and incorporates security measures to deter crime in accordance with Policy LP17.

(k) enables flexible use and adaptation to reflect changing lifestyles.

(l) identifies, manages and mitigates against any existing or proposed risks from sources of noise, emissions, pollution, contamination, odour and dust, vibration, landfill gas and protects from water body deterioration.

(m)the site is suitable for its proposed use with layout and drainage taking account of ground conditions, contamination and gas risks arising from previous uses and any proposals for land remediation, with no significant impacts on future users, groundwater or surface waters.

(n) complements and enhances the quality of riverside settings, including ecological value, renaturalisation where possible, and navigation.

(o) does not result in any unreasonable constraint(s) or threaten the operation and viability of existing nearby or adjoining businesses or employment sites by introducing "sensitive" developments."

5.9 The Fenland District Council supplementary planning document, 'Delivering and Protecting High Quality Environments in Fenland' (adopted 24th July 2014) adds two more relevant polices in support of the Local Plan policy LP16. These are DM2 and DM3.

5.10 Policy DM2 Natural Features and Landscaping Schemes states:

"In order to satisfy the requirement of criteria (c) and (i) of Local Plan Policy LP16, all development proposals should, to a degree appropriate to the scale and impact of the development, consider:

a) the existing character and features of the particular site, including its landscape and ecological features, indicating how these have contributed to the overall design approach and which features, including trees, will be removed or retained; and

b) a specification of the new trees, shrubs and hedgerow planting suitable for the location including wildlife habitat creation; and

c) new landscape works, retention and protection of other natural features such as hedgerows, field patterns, drains and other water bodies, and where possible, incorporate them into proposed new development;

d) and to ensure the development integrates appropriately into its surroundings in terms of scale, enhances any existing positive character and features and especially

takes the opportunity to remove eyesores and improve disfigured or despoiled land; and

e) provision of areas for natural ecological regeneration in connection with major development proposals; and

f) the position, design and materials of all proposed site enclosures (e.g. fences and walls); and g) car parking layout and other vehicular and pedestrian areas

h) hard surfacing materials; and

i) minor structures (e.g. furniture, lighting, refuse areas, signs etc.); and

j) and any retained historic features and proposals for restoration.

A landscaping scheme covering the above criteria should be submitted with all appropriate development proposals or, if acceptable to the Council, submitted at a later stage in order to satisfy a conditional planning permission."

5.11 Policy DM3 Making a Positive Contribution to Local Distinctiveness and Character of the Area states:

"In order to satisfy the requirement s of criteria (d) and (e) of Local Plan Policy LP16, all development (including new buildings, extensions and alterations to existing buildings) should achieve high design quality and as a minimum ensure that:

a) the development provides high quality and attractive public spaces; and

b) provision for parking motor vehicles does not dominate the design of the scheme or resulting street scene and

c) any existing views, vistas, focal points and landmarks of value are incorporated into the scheme;

d) and the character of the landscape, local built environment and settlement pattern inform the layout, density, proportions, scale, orientation, materials and features (including boundary treatment) of the proposed development, which should aim to improve and reinforce positive features of local identity; and

e) proposals are robust to withstand and adapt to the predicted impacts of climate change including measures to manage the risk of flooding and subsidence."

5.12 Current policy for determining planning applications within South Holland is contained within the 'South East Lincolnshire Local Plan 2011-2036' adopted 8th March 2019. Within the Local Plan the following policy is relevant to landscape and visual matters.

5.13 Policy 3: Design of New Development states:

"All development will create distinctive places through the use of high quality and inclusive design and layout and, where appropriate, make innovative use of local traditional styles and materials. Design which is inappropriate to the local area, or which fails to maximise opportunities for improving the character and quality of an area, will not be acceptable. Development proposals will demonstrate how the following issues, where they are relevant to the proposal, will be secured:

1. creating a sense of place by complementing and enhancing designated and non-designated heritage assets; historic street patterns; respecting the density, scale, visual closure, landmarks, views, massing of neighbouring buildings and the surrounding area;

2. distinguishing between private and public space;

3. the landscape character of the location;

4. accessibility by a choice of travel modes including the provision of public transport, public rights of way and cycle ways;

5. the provision of facilities for the storage of refuse/recycling bins, storage and/or parking of bicycles and layout of car parking;

6. the lighting of public places;

7. ensuring public spaces are accessible to all;

8. crime prevention and community safety;

9. the orientation of buildings on the site to enable the best use of decentralised and renewable low-carbon energy technologies for the lifetime of the development;

10. the appropriate treatment of facades to public places, including shop frontages to avoid visual intrusion by advertising, other signage, security shutters, meter boxes and other service and communication infrastructure;

11. residential amenity;

12.the mitigation of flood risk through flood resistant and flood resilient design and sustainable drainage systems (SuDS);

13.the use of locally sourced building materials, minimising the use of water and minimising land take, to protect best and most versatile soils;

14.the incorporation of existing hedgerows and trees and the provision of appropriate new landscaping to enhance biodiversity, green infrastructure, flood risk mitigation and urban cooling;

15. the appropriate use or reuse of historic buildings."

Response to Policy

5.14 The siting of the proposed solar farm development has been carefully considered to minimise any adverse effects on the character and appearance of the host landscape. Reference has been to the relevant SPD.

5.15 The proposals are to be located in an area with few residential properties in close proximity to the site so as to try and ensure that any effects on residential and general amenity would be kept to a minimum.

5.16 Consideration has been given to the existing landscape features on the site in particular the site's existing topography, drainage channels , trackways and woodland copse The proposed development has been designed so as to retain and incorporate these features as integral components of the overall scheme. Opportunities to enhance the character of the area have been taken through the proposed introduction of new areas of woodland and tree belts.

6. Effect on Landscape Elements and Features

Topography

6.1 The generally flat topography across the site would remain substantially unchanged as a result of the proposed development. The solar panels are to be arranged on a broadly east-west axis so as to be largely south facing.

6.2 Any minor changes to the site's landform would be restricted to temporary measures during the construction period, associated with the erection of the solar panels and associated structures/buildings and the construction of the proposed access track. Such changes would be localised and returned to the existing conditions immediately at the end of the construction works.

6.3 There would be no further changes to the topography during the operational phase. During the de-commissioning phase, above ground structures will be removed and the topography returned to its original state.

6.4 The susceptibility of the site topography to the proposed development is assessed as low. The topography of the site is typical of the host landscape and is not rare or unusual. Its value is assessed as low. With a low susceptibility and a low value, the overall sensitivity of the site topography to the proposed solar farm development is assessed as low.

6.5 At **year 1** and **year 10** of the operational phase, the magnitude of change to the site topography is assessed as negligible. With a negligible magnitude of change and a low sensitivity, the effect on the site's topography as a result of the proposed development is assessed as **negligible neutral**. The generally level profile of the site would continue to prevail with the proposals in place.

Arable land

6.6 The effect of the proposed solar farm would inevitably necessitate the loss of arable land on the site. However, grassland will replace this beneath and around the solar panels and arrays. Grassland will afford the opportunity for grazing, as part of the management regime for the proposed development, so maintaining an agricultural use on the site.

6.7 Arable land is assessed as having a high susceptibility to the proposed development. Though characteristic of the wider landscape, the arable land use on the site is not rare

or unusual and its value is assessed as low. The overall sensitivity of the arable land use is assessed as medium.

6.8 The loss of the arable land as a result of the proposed development would bring about a high magnitude of change on the site at both **year 1** and **year 10** operational phase that would lead to a **major adverse** effect. However, replacement of the arable land with grassland would, it is considered, result in the proposals having a beneficial effect by ensuring ground cover is maintained on the site at all times of the year and which could be of benefit to wildlife. Grassland margins and small pastoral fields are a component part of the existing landscape.

6.9 The effect on arable land would be long term – for the duration of the operational phase of the proposed development. Notwithstanding this, at the end of the operational phase of the proposed solar farm and following decommissioning there would be the opportunity to return the site to its current land use, if this was felt to be appropriate at the time.

Public Rights of Way

6.10 The public right of way network beyond the site boundary would be physically unchanged during the operational phase of the proposed development. On site, the existing public rights of way would remain along their definitive alignment. Several sections of the rights of way within the site would coincide with access tracks for the proposed development. This would lead to an improvement to the current surfacing of the particular routes and, it is considered, improved accessibility for users of the rights of way.

6.11 Rights of way are assessed as having a high value. The intent is to retain the existing routes across the site so that the susceptibility to the type of development being proposed is assessed as low. Overall, the sensitivity of the rights of way is medium. The magnitude of change brought about by physical change to the on-site rights of way is assessed as medium.

6.12 With a low sensitivity and a medium magnitude of change the scale of effect on the pubic rights of way within the site at **year 1** of the operational phase would be **minor**. The nature of the effect is considered to be **beneficial**. During the operational phase the access tracks would be infrequently used. Their form would be rural in appearance and would provide a good year-round accessible surface for users.

6.13 By **year 10** of the operational phase of the proposals, it is considered that the access tracks on the site would have partially grassed over so that the scale of effect would remain **minor beneficial**.

6.14 Any effect on the public right of way network beyond the site boundary would be experiential. There would also be some experiential change to the on-site rights of way too. The proposed development would be inert and largely silent. The primary experiential change would be visual (see section 8).

Woodland and hedgerow resource

6.15 The site is largely devoid of woody vegetation at present, except for a small copse/shelter belt located close to the centre of the site. This small woodland block comprises a mixture of native and non-native species including some evergreen trees. The trees are of varying condition but are generally poor.

6.16 There are presently no hedgerows on the site. However, some sections of hedgerow are found in close proximity to the site boundary.

6.17 Although of poor quality and condition, the existing woodland (and hedgerow) resource on the site is assessed as having a medium value. Similar woodland copses to the one on site form a characteristic feature of the wider landscape. The existing copse is assessed as having a low susceptibility to the type of development being proposed. Consideration has been given in the design of the proposed development to retain the existing copse. Overall, the sensitivity of the existing tree resource on the site is assessed as low.

6.18 At year 1 of the operational phase, it is assessed that the magnitude of change on the existing woodland and hedgerow resource on the site would be low. The existing copse on the site would be retained as integral part of the proposed solar farm development. The proposed solar panels and infrastructure would be set back from the woodland edge so as to help ensure its long term viability.

6.19 New woodland and hedgerow planting would be introduced onto the site as part of the proposals to enhanced biodiversity/habitat and reinforcement of a key landscape feature. The new planting would also function to provide visual mitigation. The location of the new woodland and hedgerow planting is shown on the MEP at appendix 10.

6.20 At year 1 of the operational phase the new woodland and hedgerow planting would be relatively immature. With a low magnitude of change and a low sensitivity, the effect on the existing tree and hedgerow resource on the site at **year 1** is assessed as **negligible neutral**.

6.21 By **year 10** of the operational phase, the retained existing woodland copse would have been allowed to grow on and would be managed. New woodland and hedgerow planting would have fully established and would be filling out so as to be a noticeable feature in the landscape. It is assessed that the effect on the existing woodland and

hedgerow resource on the site would have increased to **moderate**, and that the nature would be **beneficial**.

Water Features

6.22 The site is criss-crossed and contained by several drainage ditches. These features are presently in varying condition, with some overgrown with marginal vegetation. The Lady Nunn's Old Eau forms a more sinuous feature running south-north and bisecting the site.

6.23 The existing drainage channels are an important functional feature of the site and a key landscape feature. They are assessed as having a high value. The water features are assessed as having a low susceptibility to the type of development being proposed. Overall, the water features' sensitivity is assessed as medium.

6.24 At both year 1 and year 10 of the operational phase, it is assessed that the magnitude of change on the existing wate feature resource on the site would be negligible. The drainage channels would be retained on their existing alignments as an integral component of the proposed development. With a medium sensitivity and negligible magnitude of change at **year 1** of the operational phase of the proposals, the scale of effect on the site's water features is assessed as **negligible neutral**.

6.25 The water features would be protected as necessary during the construction phase as part of an agreed Construction Management Plan for the proposed development . The layout plan for the proposals includes for the solar panels to be off-site away from the drainage channels so as to enable their retention and functioning throughout the operational phase of the proposed development.

6.26 The proposals include for the creation of new reedbed planting along parts of the drainage channel network. The reedbeds are intended to provide an ecological resource but would also reinstate a landscape feature. It is assessed that the effect on the site's water features would be **minor beneficial** by **year 10** of the operational phase.

Summary

6.27 It is evident that the proposed development would not appreciably physically harm the existing landscape elements and features associated with the site. The following conclusions can be reached.

- The generally flat topography of the site would remain unchanged during the operational period of the proposed development.

- Outside the site boundary, the public right of way network would be unaltered physically with the proposed solar farm in place on the site. Inside the site boundary some sections of footpath would be improved through the creation of new access tracks. There would be some experiential change of being able to view the proposed development.
- The existing woodland copse on site would be retained. The introduction of new woodland and understorey planting together with some hedgerow planting would help to mitigate the visual effect of the proposals in the medium to longer term and provide an enhanced ecological resource on the site.
- Grassland and herbaceous vegetation could be established beneath the rows of solar panels to benefit biodiversity and wildlife. This grassland, which would replace the existing arable land on the site, would have the opportunity to be managed through a grazing regime that would allow for an agricultural function to be maintained on the site during the operational phase.
- The existing water features on site would be retained within the proposed development. They would be protected as necessary during the construction period. Their primary function as drainage ditches would be maintained during the operational phase of the proposals. The solar panels would be off-set from the edge of the water features so as to avoid any potential conflict. New reedbeds would be established along sections to recreate a landscape feature.
- The existing landscape features within the site will benefit from an agreed programme of management which would help their long-term viability within the landscape.

7. Effect on Landscape Character

Value and Susceptibility of the Local Landscape

7.1 In order to determine its value, the local landscape is evaluated based on the assessment of various landscape factors (based upon Box 5.1 page 84 of GLVIA3 and the criteria given in Landscape Institute Technical Guidance 02/21 'Assessing landscape value outside national designations) such as:

- Landscape quality (condition).
- Scenic quality.
- Rarity.
- Representativeness.
- Conservation Interests.
- Recreational Value.
- Perceptual Aspects.
- Associations.

Landscape quality (condition)

7.2 The landscape, broadly speaking, appears to be in good condition. The landscape appears well managed as part of its generally intensively farmed regime.

Scenic quality

7.3 The landscape around the site is considered to have limited scenic quality. The flat topography and strongly geometric/linear pattern of the landscape combines to make the landscape somewhat monotonous.

Rarity

7.4 The landscape containing the site is not recognised as being particularly rare or unique; as evidenced through the absence of any national or local landscape designations. At a district level, a similar landscape extends across large parts of the both South Holland and Fenland District.

Representativeness

7.5 The local area is representative on a typical fenland agricultural landscape.

Conservation Interests

7.6 The site is not in or near a Conservation Area and does not contain any listed buildings or overt heritage assets. The wider landscape containing the site does have some conservation interest.

Recreational Value

7.7 There are several public rights of way on and in the immediate vicinity of the site. The site and the wider landscape surrounding the site is considered to have some value for recreation.

Perceptual Aspects

7.8 Human influences such as roads and built form development are readily apparent in most views. Nevertheless, there is a general absence of noise and movement that give rise to a feeling of relative remoteness and of tranquillity.

Associations

7.9 There are no known specific cultural or historic associations with the site or the area surrounding the site.

Sensitivity of the Local Landscape

7.10 It is considered that taken into account the above factors, the local landscape is of medium value. It is considered that the local landscape has a medium susceptibility to the type of development proposed. Overall, it is assessed that the local landscape has a medium sensitivity to the type of solar farm development proposed.

Construction and De-commissioning Effects

7.11 Construction activities which have the potential to temporarily affect the landscape character and include:

- Deliveries to site and vehicle movements on and off site;
- Installation of solar panels; and
- Reinstatement works to areas disturbed by construction activities.

7.12 De-commissioning activities which have the potential to affect the landscape character include:

- Dismantling and removal of all installed infrastructure; and
- Reinstatement works to areas disturbed by de-commissioning activities.

7.13 From the description of the construction and de-commissioning activities as outlined above, any effects on landscape character during the construction and de-commissioning phases will be only temporary in duration.

7.14 The short-term, reversible and temporary nature of the construction and decommissioning activities on landscape character will ensure that the overall effects will be, at worst, minor adverse.

Operational Phase

7.15 The key characteristics of the site, which comprises several arable agricultural fields, are well represented in the surrounding area. The wider site context is characterised by a generally flat topography, with a medium to large scale predominantly agricultural landscape divided by main roads and drainage ditches/drains. It is considered that changes to the character of the site will not impact to any great extent upon these characteristics identified, for the wider local landscape.

7.16 There would be a notable change to the character of the site. The proposed development would introduce new elements of built form within the site. Nevertheless, the proposed solar farm development would be contained within the existing field boundaries. The proposed development would also retain the site's existing landscape features of woodland copse, and drainage channels together with a flat topography. The retained landscape features will continue to contribute to both the character of the site and the wider landscape during the operational phase of the proposed development.

7.17 The set back of the solar panels from the field boundaries and drainage channels, and the introduction of new woodland block and hedgerow planting will help reduce both the perceived physical extent of the proposed solar panels and their visibility.

7.18 The nature of the fields on the site with the proposals in place would alter, especially with the change from arable to mainly grassland. Such a change would diminish the seasonal transformations associated with an arable crop from ploughing to harvest etc. Notwithstanding such a change of nature, the fields would still be recognisable as a feature in the landscape and would still contribute to the generally medium to large scale field pattern found in the wider landscape.

7.19 The landscape elements and features in the surrounding landscape would be physically unaltered with the proposals in place. In particular, the perception of the typically flat landform across the local landscape would continue to prevail. The proposed development would maintain the strong geometric/linear pattern of the existing landscape expressed in the roads, areas of settlement, land drains, crops and woodland blocks and tree belts (where they occur). The straight rows of panels would be consistent in their form to these existing typically linear features already present in the landscape. The proposals would have no physical or perceived influence on the settlement pattern in the local landscape.

7.20 The retention of the existing woodland copse on site, in combination with the proposed landscape mitigation strategy, would assist in creating a robust and more verdant landscape setting for the proposed development. It is considered that the proposed woodland features created as part of the proposed development would be entirely consistent with the character of the local landscape as identified in the published landscape character assessments and the author's own assessment. Once mature, over the course of the operational phase of the proposals, it is considered that this new planting would have the ability to make a positive contribution as a functional, and aesthetic feature, to the local landscape.

7.21 The visual appearance of the proposed development would be constrained from outside the site boundary to a fairly limited area of the wider host landscape. The generally flat topography of the site and the wider local landscape means that the screening and filtering effect through the presence of existing vegetation, built form, drainage channel embankments etc, is amplified. The proposed new planting on the site will, once established and beginning to fill out, help to mitigate the visual effects of the proposals and to limit intervisibility of views of the proposed development from publicly accessible locations.

7.22 The proposed solar farm and battery storage development would not move and would be substantially silent from publicly accessible areas. The level of tranquillity in the local landscape would not change noticeably with the proposals in place.

7.23 With respect to noted views, features, and landmarks, their perception would not be compromised or materially harmed. The dominant vertical elements in the landscape would remain the existing overhead high voltage electricity transmission line and towers and the tree belts/woodland blocks together with wind turbines on the horizon.

7.24 In the context of other development already present, the proposals would introduce a degree of additional complexity to the area's landscape. Solar energy infrastructure on the site would alter the site character but would also enable the existing landscape

features of topography and vegetation, together with the existing field pattern, to continue to prevail. Careful management of the site and proposed ecological enhancements would provide some beneficial change.

7.25 Overall, the magnitude of change is considered to be medium with the proposed development having only limited influence over certain aspects of the local landscape but the primarily effect would be a visual. On that basis the proposed development would bring about **moderate adverse** effect upon the character of local landscape i.e. within 2 km of the site boundary, as expressed in the published landscape character assessments and the author's assessment at **year 1**of the operational phase.

7.26 An adverse effect on the local landscape would be persist over the long-term operational phase of the proposed development. Nevertheless, it is considered that by year 10 of the operational phase, the proposed tree planting on the site would have become fully established and would have filled out so as to be making a positive contribution to the site and the wider local landscape. It is considered that by **year 10** of the operational phase of the development that the effect on the local landscape would have diminished to **minor adverse**.

Summary

7.27 The proposed solar farm would include strings of solar panels, inverters, battery storage containers and other associated infrastructure. It is accepted that this may be viewed by some to be 'utilitarian and industrial in appearance'. Nonetheless, the relatively low solar panels, the presence of existing retained site vegetation, the introduction of new woodland and hedgerow planting, and the typically flat topography would help prevent them appearing overtly prominent or dominant a feature.

7.28 In appearance terms, the proposed solar farm would add some limited complexity to the character of the local landscape. However, the siting, scale and massing of the solar panels, transformers, inverters, battery storage area and security fencing would, following the first 10 years of the operational phase and the establishment and growth of the proposed new tree planting, generally only appear as a discrete elements in the landscape, rather than being observed as a single entity.

7.29 The proposed solar farm development would retain the site's existing structure of drainage channels and individual field pattern and would not substantially affect the pattern of the wider landscape. The proposed development would maintain the overall pattern of the existing landscape expressed in the roads, areas of settlement and development, and agricultural land.

7.30 The proposed development would maintain the generally strong geometric/linear pattern of the existing landscape expressed in the roads, areas of settlement, land drains, crops and woodland blocks and tree belts (where they occur). The straight rows of panels would consistent in their form to these existing typically linear features already present in the landscape.

7.31 In respect of notable views, features, and landmarks, their perception would not be unduly compromised or harmed with the proposals in place. The landscape elements and features in the surrounding landscape beyond the site boundary would be physically unaltered with the proposals in place. Any perceived changes in the character and appearance of the local landscape would be limited.

7.32 It is considered that the proposed solar farm would not completely redefine the character of the local landscape; the prevailing settled and agricultural character of the local landscape would remain. The key characteristics of the local landscape, which differentiate the local landscape from other areas, would not be fundamentally changed and would continue to prevail. On balance, it is considered that the proposed solar farm would result in an acceptable level of effect on the character of the local landscape.

8. Visual Assessment

Detailed visual assessment

8.1 Based upon the initial projected SZTV, a visual assessment was undertaken from the representative viewpoints to determine how the proposed development might influence the visual amenity of the surrounding landscape. The assessment was undertaken as part of the site survey, with the photographic assessment recording the nature of the view and the existing visibility of the site.

8.2 The site survey and photographic assessment were undertaken in September 2022. Leaf cover on existing vegetation was present and visibility at a minimum but consideration has also been given to when the vegetation is without leaf cover. The detailed assessment of the effects of the proposed development on the various representative viewpoints is given below. Reference should be made to Appendix 8.

Construction and De-commissioning Effects

8.3 Construction activities which have the potential to temporarily affect views and visual amenity receptors include:

- Deliveries to site and vehicle movements on and off site;
- Installation of solar panels and other infrastructure;
- Reinstatement works to areas disturbed by construction activities;
- Implementation of new planting.

8.4 De-commissioning activities which have the potential to affect views and visual amenity receptors include:

- Dismantling and removal of all installed infrastructure; and
- Reinstatement works to areas disturbed by de-commissioning activities.

8.5 From the description of the construction and de-commissioning activities as outlined above, any effects on visual amenity receptors and their views during the construction and de-commissioning phases will be very temporary in duration.

8.6 Therefore, the short-term, reversible and temporary nature of the construction and decommissioning activities on visual amenity receptors and their views will ensure that the overall effects will be, at worst, negligible adverse.

8.7 The detailed visual assessment focuses on the operational phase of the proposed solar farm. 4 of the viewpoints have been prepared as photomontages.

8.8 All the respective viewpoints are assessed at year 1 (short-term) and year 10 (medium-term). This is so as to take into account the development of the proposed mitigation/enhancement planting.

Viewpoint 1 – View from Guanockgate Road

Description of the baseline view and sensitivity of receptor

8.9 This view is taken from the junction of Guanockgate Road and public right of way Tydd/4/1. The latter follows an existing farm track into the site. The highway has no footway so the view is representative of those users of the highway on the carriageway. The view looks in an easterly direction and is oblique to the direction of travel of the users of the highway.

8.10 The view looks across an arable field towards the site. The site appears in the middle distance but its boundaries are formed by drainage channels and are not readily seen. The existing woodland copse on the site is seen in the centre of view.

8.11 Users of the public highway are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.12 At year 1 of the operational phase, solar panels and security fencing would be seen on the horizon in the middle distance. Not all the proposed development would be visible in the field of view. The existing copse would be visible above the solar array, as would the existing overhead electricity transmission line and towers that would still form a feature on the skyline.

8.13 At year 1 the proposed development the magnitude of change to the view is assessed as medium.

Scale of visual effect

8.14 For users of the public highway, with a medium sensitivity and a medium magnitude of change the effect on the view at **year 1** is assessed as **moderate adverse**.

8.15 At **year 10** of the operational phase, the effect would diminish to **minor adverse**. The growth of the proposed tree planting would screen a large section of the proposed

development (together with much of the overhead electricity transmission line and towers) from view. Trees would be the dominant skyline feature.

Viewpoint 2 – View from Honeyhill Farm

Description of the baseline view and sensitivity of receptor

8.16 This view is taken from Turnover Bank opposite the entrance to Honeyhill Farm. The view looks west along Turnover Bank.

8.17 A small part of the site is just discernible to the right (north) of the view. The overhead electricity transmission line and towers that pass through the southern edge of the site can be seen on the skyline. The majority of the site is screened from view through a combination of existing built form and vegetation in the intervening landscape between the observer and the site boundary.

8.18 Users of the public highway are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.19 The view would be substantially unchanged with the proposals in place. The view demonstrates that most of the proposed development would be screened from view by existing vegetation and built form in the intervening landscape between the observer, the person using the highway, and the site boundary.

8.20 At year 1 the proposed development the magnitude of change to the view is assessed as negligible.

Scale of visual effect

8.21 For users of the public highway, with a medium sensitivity and negligible magnitude of change the effect on the view at **year 1** is assessed as **negligible neutral**.

8.22 At **year 10** of the operational phase, it is assessed as remaining **negligible neutral**.

Viewpoint 3 – View from Ashtree Farm

Description of the baseline view and sensitivity of receptor

8.23 This view is taken from Broad Drove West to the north-east of Ashtree Farm. The farm itself is contained in a tree-belt and a woodland block (centre of the view). The site is

visible (though not easily distinguishable owing to the flat topography) across arable fields to either side of the highway carriageway.

8.24 Users of the public highway are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.25 At year 1 of the operational phase, the foreground and middle distance elements of the view would be unaltered. The proposed development would be seen in part in the far distance to either side of the carriageway. The edge of the solar array would be seen but owing to its comparatively low profile it would not appear as the most prominent skyline feature.

8.26 The two point of connection masts (POC-mast) associated with the proposed sub-station would be seen to the left of the view. It is considered that these elements would be similar in prominence to the existing transmission towers that cross the site. Most of the proposed development would not be visible from this location.

8.27 At year 1 the proposed development the magnitude of change to the view is assessed as medium.

Scale of visual effect

8.28 For users of the public right of way, with a medium sensitivity and medium magnitude of change the effect on the view at **year 1** is assessed as **moderate adverse**.

8.29 At **year 10** of the operational phase, the effect would diminish to **minor adverse**. The growth of the proposed tree planting would screen a large section of the proposed development from view. Trees would be the dominant skyline feature.

Viewpoint 4 – View from Goredike Bank and Turnover Road

Description of the baseline view and sensitivity of receptor

8.30 This view is taken from the junction of Goredike Bank and Turnover Road. The view is an expansive one and looks northwards across a large arable field in the direction of the site. The site extends across the view but is not readily discernible owing to the flat topography and the absence of field boundaries other than the sunken drainage channels.

8.31 The existing overhead electricity transmission line and towers that forms a feature on the skyline as it passes through the southern part of the site. The existing woodland copse on the site is also a feature in the centre of the view.

8.32 Users of the public highway are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.33 At year 1, security fencing and the edge of the solar array would be seen across the view in the far distance. The existing woodland copse and trees in the wider landscape would, however, still form the skyline together with the existing overhead electricity transmission line and towers. The foreground elements of watercourse and reeds and the arable field in the foreground to middle distance of the view would remain unaltered. The magnitude of change is assessed as medium.

Scale of visual effect

8.34 With a medium sensitivity and a medium magnitude of change, the scale of visual effect with the proposed development in place at **year 1** of the operational phase would be **moderate adverse**.

8.35 At year 10 of the operational phase, new tree belt and woodland copse planting would have full established and begun to fill out. Sections of the proposed development along the site' southern boundary would be screened from view. The new tree planting would combine with existing vegetation to create an almost continuously treed skyline. It is considered that the scale of visual effect of the proposed development at **year 10** would diminish to **minor adverse**.

Viewpoint 5 – View from Guanock House

Description of the baseline view and sensitivity of receptor

8.36 This view is taken the edge of the curtilage to Guanock House on Guanockgate Road and looks south across several fields in the direction of the site. Owing to the flat topography the site, with its generally level features, is not easily distinguishable in the wider expansive view. The existing woodland copse at the centre of the site can be seen in the far distance. Trees form much of the skyline in the view.

8.37 Users of the public highway network are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.38 The foreground and middle distance elements of arable fields and drainage channels in the view would remain unchanged in the view. Solar panels would be seen in the far distance across the view. It is assessed that there would be a low magnitude of change at year 1.

Scale of visual effect

8.39 For users of the public highway network, with a medium sensitivity and low magnitude of change the effect on the view at **year 1** is assessed as **minor adverse** .

8.40 At **year 10** of the operational phase, the scale of effect of the proposals would remain **minor adverse**. However, the growth of the proposed new tree belt planting would have begun to screen the western part of the site from view.

Viewpoint 6 – View from Sutton St Edmund

Description of the baseline view and sensitivity of receptor

8.41 This view is one taken from Broadgate at the northern end of the village of Sutton St Edmund. The view is from a break in the building line of the village and is not a typical view. Existing built form and vegetation restricts most potential views of the site from Broadgate.

8.42 The view looks eastward across several arable fields in the direction of the site. Much of the site is not visible in the view. Built form and vegetation are the dominant features in the view. The view is representative of users of the public highway network.

8.43 Users of the highway network are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.44 At year 1 solar panels would be seen in the far distance. It is assessed that there would be a low magnitude of change at year 1.

Scale of visual effect

8.45 For users of the highway network, with a medium sensitivity and a low magnitude of change the effect on the view at **year 1** is assessed as **minor adverse** .

8.46 At year 10 of the operational phase, tree planting implemented as part of the proposed development would have fully established and begun to fill out. The tree planting would screen much of the proposed development previously visible in the view. It is assessed that at **year 10** of the operational phase, the scale of effect would diminish to **negligible neutral**.

Viewpoint 7 – View from Elloe Bank

Description of the baseline view and sensitivity of receptor

8.47 This view is taken from Elloe Bank where it becomes a road to the north of the site. The view looks south and west across an arable field in the direction of the site. The site is not easily distinguishable. An area of scrubby trees is visible in the middle distance in the centre of the view . This area of vegetation is off site but adjoins Field J on the site.

8.48 Users of the public highway are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the public highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.49 At year 1 of the operational phase, most of the proposed development would not be seen in the field of view. However, solar panels would be seen in the middle distance extending to the right (west) of the view from the area of scrubby trees along the edge of Fields J and T.

8.50 Some solar panels would also be visible in the far distance to the left (east) of Elloe Bank. It is assessed that there would be a medium magnitude of change at year 1.

Scale of visual effect

8.51 For users of the public highway network, with a medium sensitivity and a medium magnitude of change the scale of effect on the view at **year 1** is assessed as **moderate adverse**.

8.52 At year 10 of the operational phase, tree planting implemented as part of the proposed development would have fully established and begun to fill out. The tree planting would

screen much of the proposed development previously visible in the view. It is assessed that at **year 10** of the operational phase, the scale of effect would diminish to **minor adverse**.

Viewpoint 8 – View from Treading Bank

Description of the baseline view and sensitivity of receptor

8.53 This view is taken from the highway section of Treading Bank just before it becomes a farm access track and the public right of way Tydd St Giles 238/19. The view looks westward across two arable fields towards the site. The high voltage overhead electricity transmission line and towers that cross the southern part of the site are the most prominent feature in the view.

8.54 Users of the public highway are assessed as having a medium susceptibility to the type of development being proposed. The view is assessed as medium value. Overall, the sensitivity of the visual receptor i.e. those using the highway, is assessed as medium.

Predicted view at year 1 and magnitude of change

8.55 At year 1 of the operational phase of the proposed development solar panels would be visible in the middle distance to the right (north) of the view. It is assessed that there would be a medium magnitude of change at year 1.

Scale of visual effect

8.56 For users of the public highway network, with a medium sensitivity and medium magnitude of change the effect on the view at **year 1** is assessed as **moderate adverse**.

8.57 At year 10 of the operational phase, tree planting implemented as part of the proposed development along the eastern edge of Field B would have fully established and begun to fill out. The tree planting would screen much of the proposed development previously visible in the view. It is assessed that at **year 10** of the operational phase, the scale of effect would diminish to **minor adverse**.

Summary of detailed visual assessment

8.58 A summary of the effects on visual amenity of the 8 representative viewpoints is given in Table 2 below.

Table 2 – Summary of the effects on representative viewpoints

Viewpoint	Sensitivity	Magnitude of change	Scale of Effect at years 1 and 10
Viewpoint 1 - View from Guanockgate Road	Medium	Medium	Year 1 – Moderate adverse Year 10 – Minor adverse
Viewpoint 2- View from Honeyhill Farm	Medium	Negligible	Year 1 – Negligible neutral Year 10 – Negligible neutral
Viewpoint 3 - View from Ashtree Farm	Medium	Medium	Year 1 – Moderate adverse Year 10 – Minor adverse
Viewpoint 4 – Goredike Bank and Turnover Road	Medium	Medium	Year 1 – Moderate adverse Year 10 – Minor adverse

Viewpoint	Sensitivity	Magnitude of change	Scale of Effect at years 1 and 10
View 5 – View from Guanock House	Medium	Low	Year 1 – Minor adverse Year 10 - Minor adverse
View 6 – View from Sutton St Edmunds	Medium	Low	Year 1 – Minor adverse Year 10 - Minor adverse
Viewpoint 7 – View from Elloe Bank	Medium	Medium	Year 1 – Moderate adverse Year 10 – Minor adverse
Viewpoint 8 – View from Treading Bank	Medium	Medium	Year 1 – Moderate adverse Year 10 – Minor adverse

8.59 Of the 8 representative views, none are assessed as experiencing a major adverse effect. The proposed development would typically be seen at a distance from publicly accessible locations outside the site boundary.

8.60 In more open areas, away from existing built form and settlement, with its associated vegetation, the visual effects of the proposals would generally be greater and would lead to a moderate adverse effect at year 1, when new tree planting implemented as part of the proposals is immature.

8.61 Once the proposed woodland and hedgerow planting has become fully established and is beginning to fill out at year 10 of the operation phase (the medium term) the moderate adverse effects on the representative viewpoints would, it is considered, diminish to minor adverse. The new planting would provide screening to the proposals both during the summer months , with full leaf cover on deciduous species, and during winter without leaf cover. The width of the proposed woodland belts and copses is such that the layering effect of tree branches and stems would be sufficient so that views of the proposed development would still be greatly restricted during the winter period.

8.62 In the long term, over the duration of the operational period of the proposed development, both the existing and proposed tree resource on the site would continue to grow and develop. The ability of the tree resource to mitigate the visual effects of the proposals would, with suitable management, continue and also to improve.

Summary

8.63 A detailed visual assessment of a selection of representative viewpoints indicate that higher level of visual effects would be generally be experienced from within or in close proximity to the site boundary. The public highway and public right of way network surrounding the site is relatively limited so that the availability of public vantage points from which the proposed development would potentially be seen is similarly restricted.

8.64 Where potential views do exist, the proposed development would be seen only as discrete parts rather than in its entirety. The flat topography and generally low level of the component elements of the proposed development would ensure that typically only the outer edge of the solar array would be seen from a particular location rather than seeing the proposals in depth. The retention of the existing woodland copse and the proposed woodland and hedgerow planting, once established and filling out, would provide visual 'breaks' in the landscape from where areas of the proposed development would be screened from view.

8.65 Typically the proposed development would be experienced visually over a distance, and in a generally wide field of view, where the proposals would not be unduly prominent or dominant. Overall it is considered that the proposed development would have a limited effect and harm on the visual amenity of the wider landscape beyond the site boundary.

9. Summary and conclusions

9.1 This Landscape and Visual Appraisal (LVA) has been prepared by Briarwood Landscape Architecture by a Chartered Member of the Landscape Institute, who through qualifications and experience is deemed competent at preparing such an assessment. The LVA has been prepared on behalf of Pathfinder Clean Energy UKDev Limited in respect of a proposed solar farm at Land east of Guanockgate Road, Gorefield ('the site').

9.2 The site comprises several agricultural arable fields and a small woodland copse and is geometric but irregular in shape. The fields within the site are almost entirely defined by a series of drainage channels and ditches. The site straddles the boundary between the districts of South Holland and Fenland District.

9.3 The proposed development is described as, "Temporary ground mounted solar photovoltaic (PV) farm with battery storage along with continued agricultural use, ancillary infrastructure and security fencing, landscaping provision, ecological enhancements and associated works." It is accepted that this may be viewed by some to be 'utilitarian and industrial in appearance'. Nonetheless, the relatively low solar panels, the presence of existing retained site vegetation, the introduction of new woodland and hedgerow planting, and the typically flat topography would help prevent them appearing overtly prominent or dominant a feature.

9.4 In appearance terms, the proposed solar farm would add some limited complexity to the character of the local landscape. However, the proposed solar farm development would retain the site's existing structure of drainage channels and individual field pattern and would not substantially affect the pattern of the wider landscape. The proposed development would maintain the overall pattern of the existing landscape expressed in the roads, areas of settlement and development, and agricultural land.

9.5 The proposed development would maintain the generally strong geometric/linear pattern of the existing landscape expressed in the roads, areas of settlement, land drains, crops and woodland blocks and tree belts (where they occur). The straight rows of panels would consistent in their form to these existing typically linear features already present in the landscape.

9.6 In respect of notable views, features, and landmarks, their perception would not be unduly compromised or harmed with the proposals in place. The landscape elements and features in the surrounding landscape beyond the site boundary would be physically

unaltered with the proposals in place. Any perceived changes in the character and appearance of the local landscape would be limited.

9.7 It is considered that the proposed solar farm would not completely redefine the character of the local landscape; the prevailing settled and agricultural character of the local landscape would remain. The key characteristics of the local landscape, which differentiate the local landscape from other areas, would not be fundamentally changed and would continue to prevail. On balance, it is considered that the proposed solar farm would result in an acceptable scale of effect on the character of the local landscape.

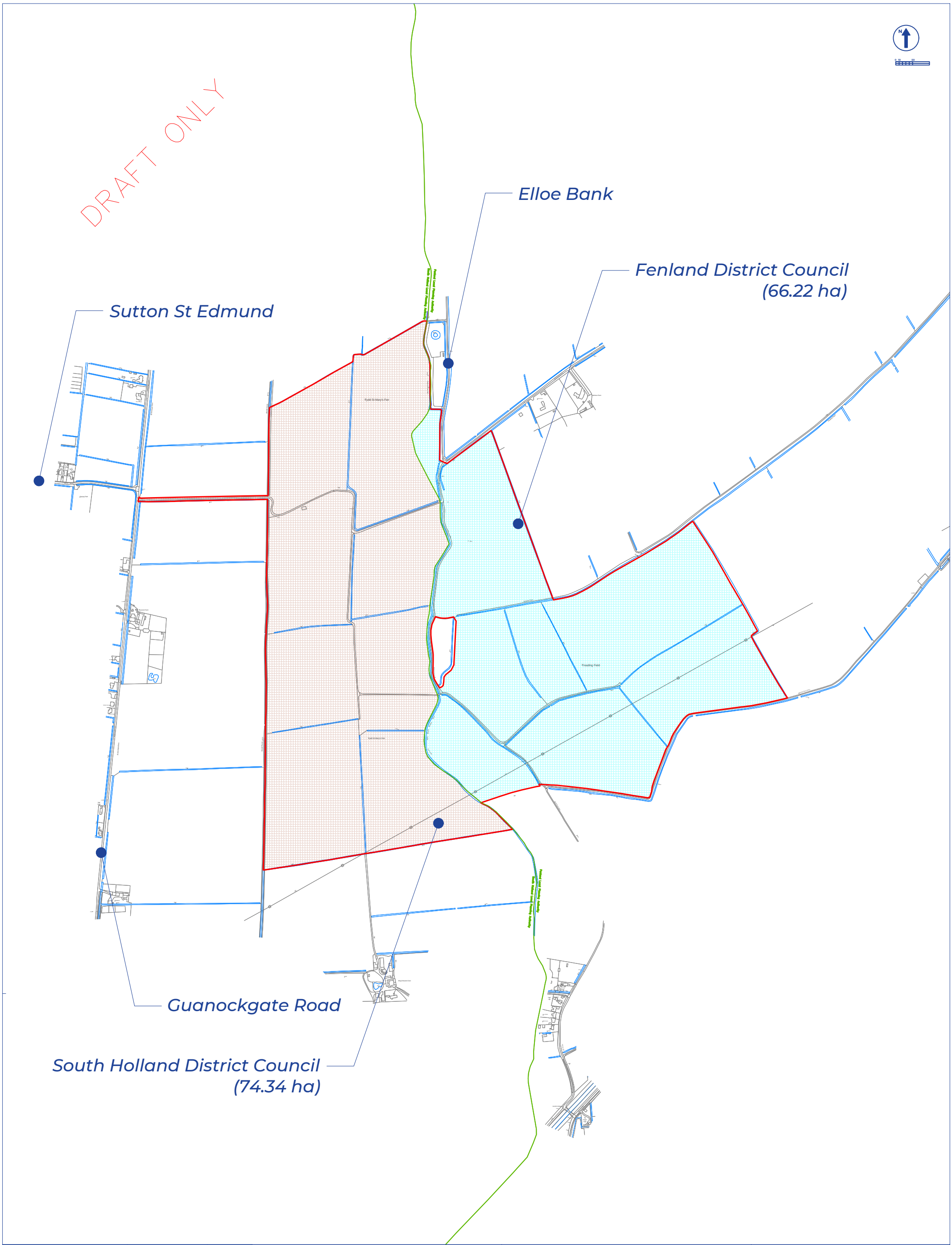
9.8 A detailed visual assessment of a selection of representative viewpoints indicate that higher level of visual effects would be generally be experienced from within or in close proximity to the site boundary. The public highway and public right of way network surrounding the site is relatively limited so that the availability of public vantage points from which the proposed development would potentially be seen is similarly restricted.

9.9 Where potential views do exist, the proposed development would be seen only as discrete parts rather than in its entirety. The flat topography and generally low level of the component elements of the proposed development would ensure that typically only the outer edge of the solar array would be seen from a particular location rather than seeing the proposals in depth. The retention of the existing woodland copse and the proposed woodland and hedgerow planting, once established and filling out, would provide visual 'breaks' in the landscape from where areas of the proposed development would be screened from view.

9.10 Typically the proposed development would be experienced visually over a distance, and in a generally wide field of view, in which it is considered that the proposals would not appear unduly prominent or dominant. Overall it is considered that the proposed development would have a limited effect and harm on the visual amenity of the wider landscape beyond the site boundary.

10. Appendices

Appendix 1 - Site Location Plan



Scale:	1:10000 (A3)	
Redline:	140.56 ha	

PACE
PATHFINDER CLEAN ENERGY

Filename: UKZ157.dwg

Drawing Title:
UKZ139_08 Location Plan

Site:
UKZ157 Tydd

Date:
24/11/2023

Key

Site Outline:

Local Planning Authority Boundary:

Fenland District Council:

South Holland District Council:

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Appendix 2 - Detailed Methodology

DETAILED METHODOLOGY

Introduction

1. This Landscape and Visual Appraisal (LVA) has been undertaken with reference to best practice, as outlined in the following published guidance:

    - Guidelines for Landscape and Visual Impact Assessment (3rd edition) - Landscape Institute/ Institute of Environmental Management and Assessment (2013)
    - GLVIA3 Statement of Clarification 1/13
    - An Approach to Landscape Character Assessment – Natural England (2014)
    - Technical Guidance Note 02/21 – Assessing landscape value outside national designations – The Landscape Institute

2. The proposed scheme is assessed for the purposes of the landscape and visual analysis.
3. As outlined in paragraph 1.11 of GLVIA3, though the processes used to undertake them are very similar, the term Landscape and Visual Appraisal has been used to distinguish this standalone report from a Landscape and Visual Impact Assessment which normally constitutes part of a larger, formal, EIA document.

Study Area

4. The initial study area for the LVA is taken to be a 5km radius from the site. Unless otherwise stated, the main focus of the assessment is taken as a radius of 2km from the site as it is considered that beyond this distance, even with good visibility, the proposed development would not be perceptible in the composite landscape.
5. The effects on settings of heritage assets or ecological/environmental assets are not considered within this LVA.

Nature of Effects

6. An impact is an action e.g. building a wall. An effect is the consequence of a particular action on the integrity of the landscape, feature or view.
7. The nature of any effect will be adverse beneficial or neutral and are summarised as:

    - Adverse - where on balance there is a negative effect on the quality, integrity or key characteristics of the landscape or visual receptor

- Beneficial - where on balance there is a positive effect on the quality, integrity or key characteristics of the landscape or visual receptor
- Neutral – where on balance the effect would maintain the quality, integrity or key characteristics of the landscape or visual receptor or where the change is different but represents neither a deterioration nor enhancement

8. Unless expressly noted, effects are deemed to be adverse in nature.

Landscape Elements and Character Assessment Methodology

9. A baseline landscape assessment is carried out to determine the current elements and character of the landscape within and surrounding the site. This involved an initial desktop study of but not necessarily limited to:
    - Ordnance survey maps at 1:50,000, 1:25,000 scales
    - Aerial photographs of the site and surrounding area
    - Datasets for rural designations from the MAGIC website (Multi Agency Geographic Information for the Countryside)
    - Relevant planning policy
    - National and local scale landscape character assessments

Visual Assessment Methodology

10. The assessment of visual effects is undertaken on the basis of viewpoint analysis as recommended in best practice guidelines. The viewpoints which are in different directions from the site and are at varying distances and locations were selected to represent a range of views and visual receptor types.
11. The viewpoints are representational and not exhaustive. They are taken from publicly accessible land and not from any third party, private, land.
12. The viewpoints were used as the basis for determining the effects of visual receptors within the entire study area. The viewpoints were photographed at 1.6 metres above ground level.

Sensitivity of Landscape Elements and Features

13. The sensitivity attributed to a landscape element or feature is determined by a combination of the value that is attached to a particular landscape element feature and the susceptibility of the landscape element/feature to changes that would arise as a result of the Proposed Development as outlined in pages 88-90 of GLVIA3. Both value and susceptibility are assessed as high, medium or low.

Table 1: Value of Landscape Elements and Features

Low	Ones that: • have no or little rarity and/or, • make no and/or make only a limited contribution to the character and local visual and amenity value and/or • are of such poor condition that the element/feature has lost its ability to contribute effectively to the character of the landscape
Medium	Ones that: • are notable in the landscape, with some visual and/or amenity interest but, • do not make a particularly strong or important contribution to the character of the landscape and/or, • ones that are an intrinsic element of landscape but in poor condition
High	Ones that: • make an important contribution to the character of the landscape and/or • have particular historical or cultural reference and/or • are distinctive or rare and typically of good condition

Table 2: Susceptibility of Landscape Elements and Features

Susceptibility to change	Criteria
High	A very limited ability of the landscape element of feature to accommodate the type of development being proposed – a particular susceptibility. Few opportunities for mitigation and enhancement.
Medium	A moderate ability of the landscape element of feature to accommodate the type of development being proposed – some susceptibility. Some opportunities for mitigation and enhancement .
Low	A well-defined ability of the landscape element of feature to accommodate the type of development being proposed – little susceptibility. Good opportunities for mitigation and enhancement .

Susceptibility of Landscape Elements and Features

14. The susceptibility criteria of landscape elements and features is given in Table 2 but a judgement has been made by linking back to the evidence gathered at the baseline stage.

Table 3: Sensitivity of Landscape Elements and Features

	VALUE			
SUSCEPTIBILITY		HIGH	MEDIUM	LOW
	HIGH	High	High	Medium
	MEDIUM	High	Medium	Low
	LOW	Medium	Low	Low

Magnitude of Change on Landscape Elements and Features

15. Professional judgement, using the criteria given in Table 4 , and also considering geographic extent and the duration and reversibility of the effect, has been used to determine the magnitude of direct physical impacts on individual existing landscape elements and features

Table 4: Criteria for magnitude of change for landscape elements and features

NB Alterations may include the addition of new elements and features

Negligible	No loss or very minor alteration to part of an existing landscape element and/or feature
Low	Minor loss or alteration to part of an existing landscape element and or feature
Medium	Some loss or alteration to part of an existing landscape element and/or feature
High	Total/major loss or alteration of an existing landscape element and/or feature

Sensitivity of Landscape Character

16. Sensitivity is determined by a combination of the value that is attached to a landscape and the susceptibility of the landscape to changes that would arise as a result of the Proposed Development as outlined in pages 88-90 of GLVIA3. Both value and susceptibility are assessed as high, medium or low.

17. Table 5 below provides a series of criteria by which the 'value' of the landscape is assessed. Such criteria are based upon Box 5.1 on page 84 of GLVIA3.

Table 5: Value of Landscape Character

Low	An area that is in a recognisably poor condition/quality and/or with a weak strength of character that typically has a clear indication of being damaged and/or contains a high number of detractors, and/or is of limited visual cohesion; rare or distinctive elements and features are not a notable component that contribute to the character of the area. No known associations with cultural/historic people.
Medium	An area is recognisable as being in reasonable condition/quality and/or with a strength of character but likely to exhibit some damage or deterioration and/or some visual cohesion and interest; rare or distinctive elements and features make some contribution to the character of the area. Possible or limited associations with cultural/historic people.
High	Areas with international or national landscape designations, i.e. National Parks and Areas of Outstanding Natural Beauty or occasionally landscapes non-designated landscape in particularly good condition/quality and/or strong strength of character or of particular local value and/or with few visual detractors; rare or distinctive elements and features are likely to be a key component that contribute to the character of the area. Recorded associations with cultural/historic people may be present.

Table 6: Susceptibility of Landscape Character

Susceptibility to change	**Criteria**
High	A very limited ability of the landscape to accommodate the type of development being proposed – a particular susceptibility. Few opportunities for mitigation and enhancement.
Medium	A moderate ability of the landscape to accommodate the type of development being proposed – some susceptibility. Some opportunities for mitigation and enhancement .
Low	A well-defined ability of the landscape to accommodate the type of development being proposed – little susceptibility. Good opportunities for mitigation and enhancement .

Susceptibility of Landscape Elements and Features

18. The susceptibility criteria of landscape elements and features is given in Table 6 but a judgement has been made by linking back to the evidence gathered at the baseline stage.

Table 7: Sensitivity of Landscape Character

	VALUE			
SUSCEPTIBILITY		HIGH	MEDIUM	LOW
	HIGH	High	High	Medium
	MEDIUM	High	Medium	Low
	LOW	Medium	Low	Low

Magnitude of Change on Landscape Character

19. Professional judgement using Table 8, and also considering geographic extent and the duration and reversibility of the effect, has been used to determine the magnitude change on landscape character

Table 8: Criteria for magnitude of change for landscape character

Negligible	No notable introduction of new elements into the landscape or change to the scale, landform, land cover or pattern of landscape
Low	Introduction of minor new elements into the landscape or some minor change to the scale, landform, land cover or pattern of landscape
Medium	Introduction of some notable elements into the landscape or some notable change to the scale, landform, land cover or pattern of landscape

High	Introduction of major elements into the landscape or some major change to the scale, landform, land cover or pattern of landscape

Sensitivity of Visual Receptors

20. Sensitivity is determined by a combination of the value that is attached to a view and the susceptibility of the receptor to changes in that view that would arise as a result of the Proposed Development as outlined in pages 113-114 of GLVIA3. Both value and susceptibility are assessed as high, medium or low.

21. GLVIA3 says a judgement should be made as to the value of a particular view being experienced. In making a professional judgement as to the value attached to a view, the following criteria have helped guide the process. Not all the criteria have to apply to a particular view and the criteria are not in a hierarchy.

Table 9: Criteria for judging levels of visual value

Low	• Views from within or towards undesignated landscapes and/or features of either importance to the site only or of no importance • View has little aesthetic merit e.g. has numerous visual detractors, is badly degraded etc. • View makes a limited contribution to the understanding of the function or wider pattern of the landscape • Views with no known social, cultural or historic associations • Views from locations that are not necessarily destination points or that are infrequently visited
Medium	• Views from within or towards undesignated landscapes and/or features of local importance • View with some limited aesthetic appeal • View makes a reasonable contribution to the understanding of the

	function or wider pattern of the landscape • Views with some known local social, cultural or historic associations • Views from locations that are locally popular destination points or that are frequently visited by locals but not necessarily by visitors from further afield
High	• Views from within or towards designated landscapes and/or features of importance at district level and above • View with great aesthetic appeal • View makes an important contribution to the understanding of the function or wider pattern of the landscape • Views with some known national or international social, cultural or historic associations especially to art and literature • Views from locations that are popular regional, national or international destination points or that are frequently visited by large numbers of visitors from further afield

Susceptibility of Visual Receptors

22. GLIVA3 advises (on page 113) that susceptibility of a particular visual receptor (observer) to change in a view is mainly a function of the nature of the activity or occupation of the person or people experiencing a view at a particular location and the extent to which their interest or attention is drawn to the view.

23. In general, it is considered that occupiers of residential properties and people using public rights of way (where enjoyment is primarily drawn from the view) have a high susceptibility to change. Users of roads, railways and open space or engaged in an activity where an appreciation of the view forms a part of the experience are considered to be of medium susceptibility. People engaged in formal sport or occupiers of commercial premises or in areas of employment, where the view has limited importance to the activity being undertaken, are considered to be of low susceptibility to change.

Table 10: Sensitivity of Visual Receptors

	VALUE			
SUSCEPTIBILITY		HIGH	MEDIUM	LOW
	HIGH	High	High	Medium
	MEDIUM	High	Medium	Low
	LOW	Medium	Low	Low

Magnitude of Change on Visual Amenity

24. Professional judgement has been used to determine the magnitude change on landscape character based upon the criteria outline in Table 11 but also considering the size and scale of change (including the loss or addition of features, changes in visual composition etc.) , the geographic influence of the change (orientation and angle of view in relation to the visual receptor, distance of the viewpoint from the main development, extent of area over which change would occur etc.) and, the duration and potential reversibility of any change (short term 0-5 years, medium term 5-10 years, long term 20 years +, temporary, permanent, intermittent, continuous and whether the views will be full, partial or glimpsed).

Table 11: Criteria for magnitude of change for visual receptors

Negligible	No notable change in the view
Low	Some change in the view that is not prominent / few visual receptors affected
Medium	Some change in the view that is clearly visible and forms an important but not defining element in the view
High	Major change in the view that has a defining influence on the overall view / many visual receptors affected

Scale of Effects

25. The scale of the landscape and visual effects is determined by cross referencing the sensitivity of the landscape feature, landscape character or view with the magnitude of change. The scale of effects is described as major, moderate, minor or negligible.

Table 12: Scale of effect thresholds for landscape character, landscape elements/features and visual receptors

		Magnitude of Change			
		High	**Medium**	**Low**	**Negligible**
Sensitivity	**High**	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible

Appendix 3 – Context Views

Briarwood
Landscape Architecture

Context View 1 - Looking north across the site

Context View 2 - Looking east across the site

Briarwood
Landscape Architecture

Context View 3 - Looking south across the site

Context View 4 - Looking west across the site

Appendix 4 – Landscape Features Plan

Image source: Google Earth. Date of image: 2018

The Site

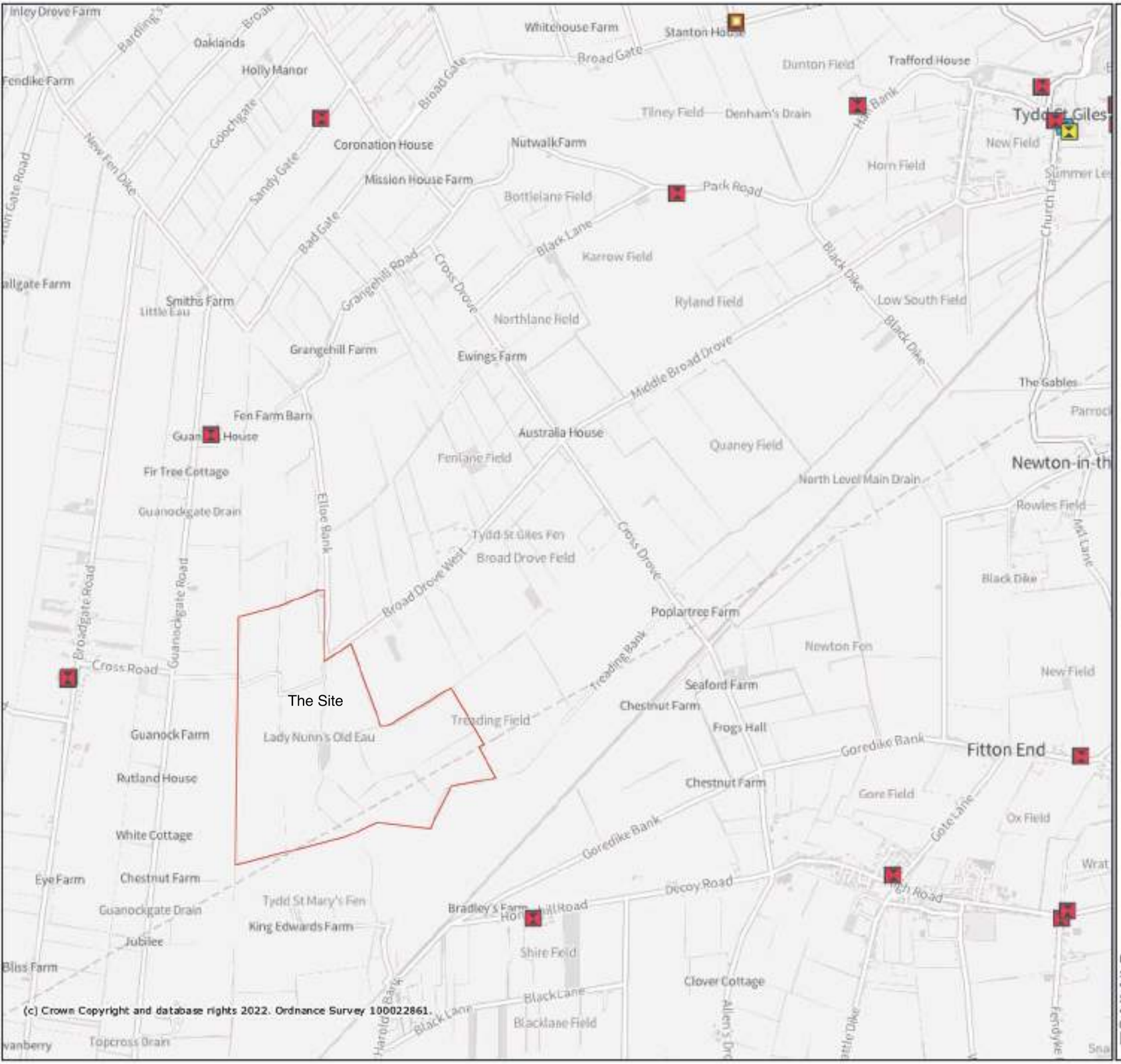
Briarwood
Landscape Architecture

PROJECT UKZ157 - Tydd Solar Farm			
CLIENT Pathfinder Clean Energy UKDev Limited			
DRAWING Landscape Features Plan			
SCALE NTS	DATE 18/10/2022	DRAWN SW	
DRAWING NUMBER BLA175-02		REVISION	

Appendix 5 – Designations

MAGIC

Tydd Solar Farm - Designations



Legend

- Areas of Outstanding Natural Beauty (England)
- Scheduled Monuments (England) - points

Listed Buildings (England)

- I
- II
- II*
- Registered Battlefields (England)
- Registered Parks and Gardens (England)

Projection = OSGB36
xmin = 531200
ymin = 310100
xmax = 548200
ymax = 318100

0 0.5 1
km

Map produced by MAGIC on 18 October, 2022.
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Appendix 6 – Extract from NCA 46 The Fens

National Character Area profile:

46. The Fens

www.gov.uk/natural-england

NATURAL ENGLAND

Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper,[1] Biodiversity 2020[2] and the European Landscape Convention,[3] we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

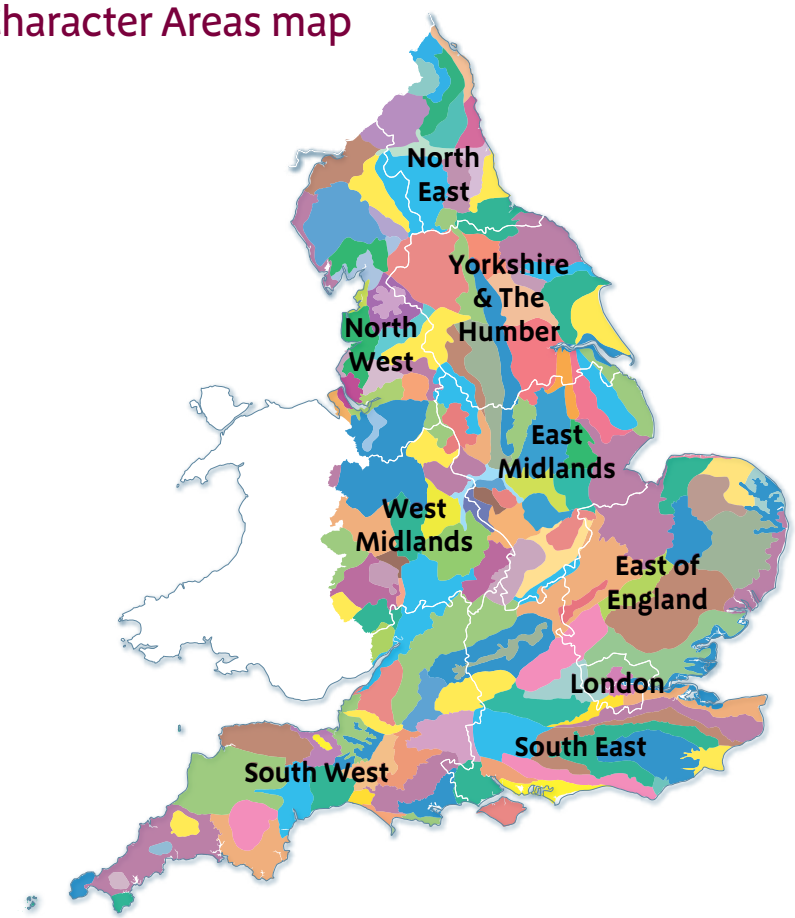
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage broader partnership working through Local Nature Partnerships. The profiles will also help to inform choices about how land is managed and can change.

Each profile includes a description of the natural and cultural features that shape our landscapes, how the landscape has changed over time, the current key drivers for ongoing change, and a broad analysis of each area's characteristics and ecosystem services. Statements of Environmental Opportunity (SEOs) are suggested, which draw on this integrated information. The SEOs offer guidance on the critical issues, which could help to achieve sustainable growth and a more secure environmental future.

NCA profiles are working documents which draw on current evidence and knowledge. We will aim to refresh and update them periodically as new information becomes available to us.

We would like to hear how useful the NCA profiles are to you. You can contact the NCA team by emailing ncaprofiles@naturalengland.org.uk.

National Character Areas map



[1] The Natural Choice: Securing the Value of Nature, Defra (2011; URL: www.official-documents.gov.uk/document/cm80/8082/8082.pdf)
[2] Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf)
[3] European Landscape Convention, Council of Europe (2000; URL: http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm)

Summary

The Fens National Character Area (NCA) is a distinctive, historic and human-influenced wetland landscape lying to the west of the Wash estuary, which formerly constituted the largest wetland area in England. The area is notable for its large-scale, flat, open landscape with extensive vistas to level horizons. The level, open topography shapes the impression of huge skies which convey a strong sense of place, tranquillity and inspiration. One per cent of the NCA falls within the Norfolk Coast Area of Outstanding Natural Beauty.

It is a large, low-lying, flat landscape with many drainage ditches, dykes and rivers that slowly drain towards the Wash, England's largest tidal estuary. The single obvious factor uniting the Fens is the low-lying, level terrain reflecting its geological past. With the exception of the Isle of Ely, which reaches above 20 m, elevations rarely pass the 10 m contour, and typically vary by little more than one or two metres over long distances. Much of the land is below sea level, relying on pumped drainage and the control of sluices at high and low tides to maintain its agricultural viability. The level horizons and the huge scale of the landscape create a strong sense of isolation and tranquillity, and a distinctive sense of place. There are, typically, large open panoramas and enormous skies, whose changing weather patterns have a strong influence on the observer. Four major rivers drain into the Wash: the Witham, Welland, Nene and Great Ouse. All rivers now have artificial canalised courses that run straight for long distances and are bounded by high banks to contain the watercourse from the lower adjacent fields.

The Fens are the bread basket of Britain. The drainage of this area from the 17th century onwards presented valuable soils which provide excellent conditions for large-scale cultivation of arable and horticultural crops; holdings of more than 100 ha make up 77 per cent of farmed land. As cultivation techniques have become more intensive, however, the soil resource is increasingly diminished through desiccation and erosion. Clays and silts laid down by marine incursions dominate the area abutting the Wash and extend inland along the rivers, forming the fertile horticultural soils of the silt fens. This area is now marginally higher in altitude than the inland peatlands which have 'wasted'. The fertile peat soils have been historically drained and managed to support national food production at the expense of other ecosystem services. Drained peat is more vulnerable to loss, particularly where the deposits are deep and the water table is kept artificially low. Peat wastage through shrinkage, oxidation and wind erosion is a long-term issue affecting the ecosystem services of the Fens.

The Wash includes salt marsh and mudflats that support large, internationally important populations of seals, waders and wildfowl, including pink-footed and Brent geese, shelduck, knots, oystercatchers, common terns and various plover species. It is accordingly designated a Ramsar site, a Special Area of Conservation (SAC), a Special Protection Area (SPA), a European Marine Site (EMS), a Site of Special Scientific Interest (SSSI), a National Nature Reserve (NNR) and a Local Nature Reserve (LNR). Other important wetland habitats include areas of relic old fen, washland, rivers, drains and a network of lesser drainage channels known locally as ditches, dykes or sewers.

Several SSSI in the Fens are designated for their buried interest – a geological record contained in the sediments of the Wash basin and fenland – making

an important contribution towards our understanding of the effects of climate and environmental change over millions of years. Also, the Oxford Clay and Kings Dyke brick pit have been very important for palaeontology, with major Jurassic reptiles including the pliosaur *Pachycostasaurus dawnii* unearthed here. *Leedsichthys*, the world's largest fish, was discovered in these sediments and is still being unearthed from them.

There is a long history of human occupation here, accounts of which can be found in the Historic Environment Records for Norfolk, Suffolk, Cambridgeshire, Peterborough and Lincolnshire. Early prehistoric sites are mostly deeply buried beneath the fen sediments or occur on the low slopes of the higher fen 'islands'. Scheduled Ancient Monuments of prehistoric to post-medieval date are located across the fens and many undesignated sites and monuments are known, again mainly from the fen edges and islands. However, Flag Fen is a site of international importance – a preserved, wooden, bronze-age platform and causeway crossing the marsh to the east of the Peterborough fen edge, off which votive deposits (symbolising a wish, desire or prayer) of bronze and iron tools, weapons and decorative items were thrown into the marsh.

Ancient remains of settlements or task sites are increasingly being discovered as the peat dries out across the fenland area, or through development – for example eight log boats were found in an ancient river channel along with associated riverside settlements at Whittlesey, and numerous artefact scatters of prehistoric to Roman sites are annually ploughed up where the peat is thinnest on the gravel island edges and emerging crests. The impressive Ely Cathedral is a major landmark dominating the Cambridgeshire peat fen from its location atop the Isle of Ely, as is 'Boston Stump' (St Botolph's Church, Boston) in the Lincolnshire silt fen, while similar island-top locations were also used for monastic and secular establishments across the fenland region (such as Ramsey, Thorney, Crowland and Chatteris). Lodes, slades and canals historically formed the early transport opportunities across the fens, commencing after the Roman conquest of Britain but increasingly in the late Saxon and medieval periods.

Authors Sir Harry Godwin and H.C. Darby have written major works on the Fens, and Rex Sly has chronicled the history of the Fens from Roman times until the present and written about fenland families and life in a series of three books published in the 2000s. Chris Gerrard has authored a book of work by fenland artists showcasing the landscapes and biodiversity of the Fens.

Although many of the Fens waterways are heavily embanked, limiting views across the landscape, water-based recreation is a popular pastime with a focus at Ely marina. Angling is popular here.

Click map to enlarge; click again to reduce

Statements of Environmental Opportunities:

- **SEO 1:** Manage the agricultural landscape and soils which allow the Fens to be a major provider of food and horticultural produce, while seeking to enhance opportunities for biodiversity.
- **SEO 2:** Manage the core wetland complexes and increase their connectivity by enhancing the main rivers, waterways and their associated riparian habitats and improve recreational access opportunities to the Fens.
- **SEO 3:** Plan for the creation of new coastal landscapes in the Wash area that are adapted and resilient to the impact of climate change, for the benefit of people and wildlife.
- **SEO 4:** Conserve, manage and enhance the Fens landscape and increase educational opportunities to access its geodiversity, archaeology and cultural heritage to enhance enjoyment and understanding for those who live and work in and visit the Fens.

The Fens today.

Description

Physical and functional links to other National Character Areas

The area abuts a number of other National Character Areas (NCAs). To the east lie North West Norfolk and The Brecks NCAs. To the south-east rises the gently rolling East Anglian Chalk NCA and to the south-west is the undulating Bedfordshire and Cambridgeshire Claylands NCA. To the west rise the gently shelving slopes of the Kesteven Uplands and the South Lincolnshire Edge NCAs. To the north-west the woods and gravel workings of the Central Lincolnshire Vale NCA gradually slope down to the Lincolnshire fens, while due north the Lincolnshire Wolds NCA rises to create a dominant 'upland' horizon. The Steeping River marks the quieter north-east boundary to the Lincolnshire Coast and Marshes NCA. The land boundary of the Fens is typically drawn along a series of catchwater drains, dykes, canalised rivers and lodes. To the north-east the Fens are bounded by the North Sea.

Four main rivers, the Witham, Welland, Nene and Great Ouse, drain much of the surface water from the East Midlands across the Fens. The rivers often flow in canalised channels before discharging into the large Wash estuary. The rivers and their associated networks of ditches and dykes provide ecological networks and functional links to other NCAs.

Marine processes strongly influence the physical and biological character of the Wash. Marine sediments originating from the eroding nearshore seabed off central Lincolnshire and the Holderness coast of East Yorkshire predominate, although some accreted sediments originate from further north. While much of this sediment settles within the Wash, some moves seaward again to help supply the coastal structures along the North Norfolk coast.

Due to its low-lying landform, views to and from the neighbouring NCAs strongly reflect their geology, particularly the higher ground of the gently rolling East Anglian Chalk NCA to the south-east, the undulating Bedfordshire Claylands to the south-west, and to the west the gradually shelving slopes of the Kesteven Uplands and the South Lincolnshire Edge NCAs, while due north the Lincolnshire Wolds NCA rises to create a dominant elevated horizon. There are vast, open views of the sky throughout and wide, flat panoramic views, particularly over the mudflats of the Wash in the east.

Fenland farming is nationally important with, for example, a quarter of England's potatoes grown here and over one-third of English vegetables. Agriculture is the major source of employment, with approximately 27,000 people employed either permanently or seasonally/temporarily throughout the year. Nearly 90 per cent of the Fens were classified as either Grade 1 or Grade 2 agricultural land under the Provisional Agricultural Land Classification (ALC) survey of the late 1960s and early 1970s. Peat wastage will have reduced this since then.

The Fens play host to several major transport links. The East Coast railway mainline cuts across the south-western corner and there are east–west rail passenger and freight lines running through the area. Major roads include the A47, the A16 and A17, among numerous other A roads which form transport corridors across the landscape. Other major infrastructure, such as power stations, major gas and electrical distribution networks, either supply surrounding NCAs or the Fens are supplied by them.

Distinct areas

- Open coastal marshes
- Drained coastal marshes
- Settled inland fens
- Open inland fens

Key characteristics

- Expansive, flat, open, low-lying wetland landscape influenced by the Wash estuary, and offering extensive vistas to level horizons and huge skies throughout, provides a sense of rural remoteness and tranquillity.
- Jurassic clays are overlain by rich, fertile calcareous and silty soils over the coastal and central fens and by dark, friable fen peat further inland. The soils are important for agriculture, which is hugely significant for the rural economy in the Fens. There are over 4,000 farms in the Fens; enough wheat is grown here annually to produce a quarter of a million loaves of bread and one million tons of potatoes are grown here. In addition to traditional vegetables, exotics such as pak choi are now cultivated. Some 40 per cent of England's bulbs and flowers are also produced in the Fens.
- The Wash is the largest estuarine system in Britain, supporting internationally important intertidal and coastal habitats influenced by constant processes of accretion and deposition, forming salt marsh and mudflats and providing habitats for wildfowl, wading birds and other wildlife, including grey seals and approximately 90 per cent of the UK's common seals. It also provides important natural sea defences and plays a key role in climate change regulation. Flood storage areas on the Nene, Cam, Lark and Ouse washes also provide significant biodiversity interest. True fen mainly occurs at remnant conservation sites, such as Baston or Wicken Fen.
- Overall, woodland cover is sparse, notably a few small woodland blocks, occasional avenues alongside roads, isolated field trees and shelterbelts of poplar, willow and occasionally leylandii hedges around farmsteads, and numerous orchards around Wisbech. Various alders, notably grey alder, are also used in shelterbelts and roadside avenues.
- The predominant land use is arable – wheat, root crops, bulbs, vegetables and market gardening made possible by actively draining reclaimed land areas. Associated horticultural glasshouses are a significant feature. Beef cattle graze narrow enclosures along the banks of rivers and dykes and on parts of the salt marsh and sea banks.
- Open fields, bounded by a network of drains and the distinctive hierarchy of rivers (some embanked), have a strong influence on the geometric/rectilinear landscape pattern. The structures create local enclosure and a slightly raised landform, which is mirrored in the road

Key characteristics (continued)

network that largely follows the edges of the system of large fields. The drains and ditches are also an important ecological network important for invertebrates, fish including spined loach, and macrophytes.

- The area is very rich in geodiversity and archaeology, with sediments containing evidence for past environmental and climate changes and with high potential for well-preserved waterlogged site remains at the fen edge, within some of the infilled palaeo-rivers and beneath the peat.

- Large, built structures exhibit a strong vertical visual influence, such as the 83 m-high octagonal tower of 'Boston Stump' (St Botolph's Church), Ely Cathedral on the highest part of the Isle of Ely dominating its surrounding fen, wind farms and other modern large-scale industrial and agricultural buildings, while drainage and flood storage structures and embanked rail and road routes interrupt the horizontal fen plain.

- Settlements and isolated farmsteads are mostly located on the modestly elevated 'geological islands' and the low, sinuous roddon banks (infilled ancient watercourses within fens). Elsewhere, villages tend to be dispersed ribbon settlements along the main arterial routes through the settled fens, and scattered farms remain as relics of earlier agricultural settlements. Domestic architecture mostly dates from after 1750 and comprises a mix of late Georgian-style brick houses and 20th-century bungalows.

Wisbech North Brink - the tidal River Nene and inland port.

The Fens today

The Fens are an expansive, flat, open, clay and peat landscape that slowly drains towards the Wash, England's largest tidal estuary. The obvious factor characterising the Fens is the low-lying, level terrain, with much of the land below sea level. The level horizons, large open panoramas and enormous skies create a strong sense of remoteness and isolation. The geological history and human intervention are strongly evident in this landscape, especially in the strong rectilinear drainage pattern that has long been used to make the land viable for agricultural production. The Fens are the bread basket of Britain and the silt and peat soils are a major and essential resource of national importance for agriculture, with wheat, vegetables and sugar beet of major value here.

The geology of the Fens can generally be described as glacial deposits on Jurassic and Cretaceous bedrock. During the Holocene (Flandrian) period, these were overlain by diverse deposits, including sands, silts, clays and peat. Elevated islands of Jurassic clay occur at the inner margins of the area where they may be overlain by Pleistocene tills or glacial sands and gravels. The soils over the wide central and coastal fens comprise rich, fertile, stoneless, calcareous, silty soils of marine origin; while inland there are swathes of dark, friable, organic-rich mineral soils and deeper fen peat, which contains partly fossilised trees known as 'bog oaks'. Due to wastage, the peats are becoming increasingly thin and in extensive areas only remnants of the former peat coverage still remain.

Agriculture is tremendously important to and in the Fens. Fenland farming is nationally important, with a quarter of England's potatoes grown on 25,000 ha here and more than a third of English vegetables on 29,000 ha. Sugar beet, at 21,500 ha, is another major fenland crop. Farmers have recently diversified into more exotic crops such as pak choi. Agriculture is a major employment sector, attracting workers from across Europe.

Water from much of the East Midlands drains eastwards across the Fens into the Wash through four major rivers: the Witham, Welland, Nene and Great Ouse. All rivers now have artificial canalised courses that run straight for long distances and are bounded by high banks to contain the watercourse from the lower adjacent fields. In some locations 'roddons', sinuous silt banks that are fossilised remnants of tidal creek systems, are elevated, in some places up to 2–3 m above the dark peat soils which have subsequently wasted as a result of continuous cultivation, drainage and wind erosion of the peat. This irreversible wastage creates an ever-greater demand for artificial drainage of the land. Remnants of the original fen, as at Wicken Fen, are rare exceptions.

There are marked variations and graduations in the Fens landscape, shaped by the differing lengths of settlement history. The 'settled inland fens', which run in a broad arc inland from the Wash between King's Lynn and Boston, form an ancient, small-scale landscape of sinuous lanes and relative intimacy with a higher density of settlements, some fine churches and remnant grasslands. The extensive 'peaty fens' or 'black fens', which were finally comprehensively drained in the 17th to 19th centuries, comprise broad rectilinear fields and straight roads. The only consistent relief to the level landform are the notches of the drainage ditches and the raised berms and banks of the artificial drainage channels. The fens of south-east Lincolnshire between the settled inland fens, where there are some hedgerows along the sinuous lanes, and the Wolds were the last area to be drained. The drainage here was so thorough that scarcely a vestige remains of what had been one of Britain's richest wildlife habitats. This is an open, productive landscape with a strongly rectilinear form. The band of marshes reclaimed from the Wash by the construction of a series

of sea wall defences begun in the 17th century has fields of vegetable crops that stand alone against the sky. Beyond the defensive walls, salt marshes and tidal mudflats, often abundant with wildfowl, stretch out into the Wash.

The Wash, an internationally important Special Protection Area (SPA)/ Ramsar site, is the largest estuarine system in Britain and this vast seascape supports an extensive habitat mosaic of salt marshes, intertidal banks of sand and mud, shallow waters and deep channels. It is the most important staging post and overwintering site for migrant wildfowl and wading birds in eastern England. It supports a valuable commercial fishery for shellfish, is an important nursery area for flatfish and holds one of the North Sea's largest breeding populations of common seals and some grey seals.

The Fens are also very important for biodiversity. The Ouse Washes and Nene Washes SPA/Ramsar sites are areas of seasonally flooded grassland important for national and international populations of breeding and overwintering waders and wildfowl. Both sites are of note for their diversity of plant and animal life. Their associated watercourses are designated for important spined loach populations. In the Welland catchment, the Counter Drain in Baston Fen Special Area of Conservation (SAC) contains high densities of spined loach. Fenland SAC holds large areas of calcareous fen and is also important for populations of spined loach and great crested newt. The Wash and North Norfolk Coast SAC is considered to be one of the best areas in the UK for sand banks and Atlantic salt meadows. In terms of biodiversity, Wicken Fen is the richest site in the UK; Holme and Woodwalton Fens are also important relic habitats.

There is negligible woodland throughout the Fens landscape, with a few trees lining roads or clustering around villages and the fen estates, as at Thorney. Exceptions include Woodwalton to the west and small ex-decoy woodlands such as in the Eastern Fens, where for instance Friskney Decoy Wood is a Lincolnshire Wildlife Trust (LWT) reserve. Extensive orchards and associated windbreaks are located in the Wisbech area to create a distinctive though dwindling landscape cover.

On the island crests and at the fen margins, archaeological features occur in large numbers, while fewer are known from the undulating deeper parts of the fen basin as here they are covered by blanketing deposits of marine clays, peat and silts. Flag Fen Archaeology Park and Scheduled Ancient Monument is home to a bronze-age wooden causeway, some 3,500 years old, and is a site of national and international importance.

Stonea Camp iron-age hill fort near March in the Cambridgeshire Fens is the lowest-lying hill fort in Britain. It has been suggested as the site of Boudicca's last stand against the Romans. Having defeated the local tribes, the Romans erected a substantial administrative/military building near Stonea Camp to impose their authority in the Fens, by then a probable imperial estate. The Fens were very important in Roman times and the Fen Causeway, or Fen Road, stretched for over 40 km between Denver, Norfolk, and Peterborough through Flag Fen, where it joined the major Roman north–south route, Ermine Street.

Around the low, clay hills, most notably the Isle of Ely, occasional remnant ridge-and-furrow pasture is evident.

The settlement pattern follows the historical development of the area. The settled inland fens or 'townlands' comprise medium to large settlement clusters around Boston, Spalding, Holbeach and Wisbech, with many villages having fine medieval churches, such as West Walton. The medieval pattern of north–south drove lines, between parent and daughter settlements on the coast and fen edge

respectively, was crossed in the 19th century by the A17 and A47. Since then the settlements in these townlands have spread along these principal routes to create ribbon developments of smallholdings, modern bungalows, farmsteads with large agricultural barns, and food processing buildings, such as Sutton Bridge.

The 'peaty fens' inland are, by contrast, very sparsely settled with isolated farmsteads and houses on local areas of raised land being the only built elements for long distances. Many fenland buildings are now derelict; either standing at alarming angles or shored up, while the linear roads have likewise suffered showing significant undulations.

Ely, Boston, Wisbech, Spalding and King's Lynn provide the major historic settlements within the Fens. Ely Cathedral dominates the skyline over a large area 'like a great ship tugging at its moorings' (Betjeman). At Boston, once England's largest port, the 83 m-high octagonal tower known as the 'Boston Stump' is a marker across the open fen. Stone for large buildings, including Ely Cathedral and the Boston Stump, was imported from the quarries of Lincolnshire (Ancaster), Northamptonshire (Barnack, now Cambridgeshire), Rutland and Yorkshire. The brick industries around Whittlesey have provided key vernacular characteristics for the landscape in that area, the products of which have been used for the traditional building style of brick and slate-roofed farmhouses and brick-pantile workers' cottages. The subtle variation in settlement patterns from fen to fen reflects settlement history and the length of time since drainage took place. A few historic pumping stations such as Stretham bear witness to the latter. Local building materials include reed for thatching and clay for bricks, with its variations in colour and texture, but the use of thatch is now exceptional as a result of the loss of reedbeds.

Roads and rail links are often situated on elevated banks, and long straight roads crossing the large fenland fields are typical. Road schemes, power lines, industrial and residential development have had an impact on local character, and light pollution associated with transport networks has become increasingly prevalent.

Communities in this NCA include many migrant workers, have high indices of multiple deprivation (IMD), and various health issues, including obesity, lower-than-average life expectancy and high levels of physical inactivity, and many experience issues with isolation. The ageing population is also an issue.

The fenland waterways are an important recreational resource and there is a major marina at Ely. Long-distance walking routes include the Ouse Valley Way, Hereward Way and Nene Valley Way while the old drove roads are an important cycling resource. Access to wildlife is of major importance for recreation and tourism, especially at the many designated sites with good visitor access. For example, the Wildfowl and Wetlands Trust (WWT) Welney Wetland Centre, part of the Ouse Washes SPA/Ramsar site, is a spectacular swan spectacle and major attraction, and Wicken Fen is one of the top tourist sites in the Fens.

Agriculture in the Fens.

The landscape through time

The solid geology of the Fens is dominated by Upper Jurassic marine clays, including the Oxford, Ampthill and Kimmeridge Clays (formed around 157–152 million years ago). Tectonic activity and sea-level changes have raised these deposits above sea level; the clays have yielded tremendously important fossil reptiles and fish new to science, including the pliosaur *Pachycostasaurus dawnii* and *Leedsichthys*, the largest fish ever discovered, as well as many invertebrate species. Additionally, an isolated mass of richly fossiliferous Upper Jurassic Corallian Limestone, including coral reef deposits, out-crops around Upware. Lower Greensand rocks at Ely and Stuntney, and Lowestoft Till at March, also form 'islands' for historic centres of human settlement.

Much of this geology is overlain by Quaternary deposits: the area was covered by a large ice sheet during the Anglian glaciation around 50,000 years BP and glacial erosion beneath the ice sheet is thought to be responsible for the scouring-out of the Fen Basin and the area now occupied by the Wash. The ice sheet deposited sands, gravels and clays across the area and left a shallow basin in which later deposits accumulated. During the Holocene, a cyclic succession of peats, estuarine and marine silts, clays and sands was deposited in both terrestrial and marine environments, reflecting sea-level changes and river flood plain activity. These demonstrate a detailed record of climatic and environmental changes over the last 11,500 years although part of this record is threatened by the shrinking peat, increased exposure and erosion. Several Sites of Special Scientific Interest (SSSI) within the NCA have been designated for this geological climate- and landscape-change record.

Much of the human history of the Fens has been a battle of man against the

A modern addition to the landscape.

forces of nature to bring out the full agricultural potential of the land. Much of the early archaeological evidence is now becoming apparent as peat wastage exposes evermore well-preserved remains. In the deepest areas of the fen basin, Mesolithic and Neolithic occupation remains lie buried beneath 4–5 m of later water-related deposits. However, these early prehistoric sites occurred on former, dry, land surfaces, indicating a period when these lowest-lying parts of the fen basin were host to dry grassland with areas of pine and deciduous woodlands – a time before the fens were wet. Nationally important designated sites of the Bronze Age are known from Flag Fen, Peterborough and Must Farm, Whittlesey, where wooden platforms, raised causeways, piled settlements and a group of eight boats have been found. In Lincolnshire, evidence of Neolithic and bronze-age occupation is often closer to the surface and tends to be known only towards the western edge.

Roman settlements occurred mainly on the high, drier islands and above the fen edge, while contemporary transport canals indicate huge efforts to traverse and control the fens. Car Dyke links the River Witham to the River Cam, while the Fen Causeway canal and road system linked a major Roman settlement at Peterborough with the Norfolk fen edge at Denver. Although salt-making sites were known throughout the fens from the 1st millennium BC, such as at Northborough, the industrialisation of this economy took off in the Roman period (for example at Deeping and Morton Fens and in the tidal creeks at March) with further expansion during the Saxon and medieval period.

In the Middle Saxon period, from around 650 AD, high-status centres and hermitages on the fen islands became centres of communities which later became monasteries with massive estates such as that at Crowland, Ramsey and Thorney. The earliest sea defences, the sea banks and sea dykes date from this period although they were subsequently expanded and modified.

At the time of the Domesday Book in 1086, monastic houses owned the vast majority of the fen and fen-edge land. The swamps of the 'black fen', veined with watercourses, famously provided refuge for the Saxon folk hero Hereward the Wake in his resistance to the Norman authorities. A monastery preceded the establishment of the abbey and the cathedral church at Ely and lands on the clay island were granted to the monks to tend. The monasteries were at the heart of large-scale attempts to drain the fens, including the creation of stretches of canalised waterways. The River Great Ouse was diverted to run close to the Isle of Ely in the 13th century.

During the Middle Ages, the wetland resource of the Fens was widely used and was a centre of productivity for fishing, wildfowling, grazing, peat extraction and salt production. Medieval fisheries owned by the numerous fen monasteries occur at the margins of the former fen meres, for example those at Whittlesey, Willingham and Soham, and eels were a dominant element of the fenland food repertoire and manorial/local economies. Requiring greater connectivity across the marshes, the medieval monasteries and abbeys promoted the realignment and canalisation of some of the fenland rivers, as at March and Ely, and created canals and slades for transport between various islands – such as those between Ely, Chatteris and Ramsey.

In the 15th century, further attempts to create comprehensive drainage systems included the 22-km Mortons Leam, which still functions today, cut between Peterborough and Guyhirn under the aegis of Bishop Morton to carry waters of the River Nene to the Wash. This was the prototype for post-medieval fenland drainage schemes. Piecemeal drainage through 'assarting',

the process by which common land was enclosed under licence from landlords, allowed areas off the fen edge to be drained. This can be seen in the field systems surrounding some of the fen islands.

Seasonal grazing was prevalent in the medieval period when a pattern of radiating drove lines known as 'The Smeeth' developed between the coast and the inland grazing on the fens. Salt-making was also characteristic at that time. Residual mounds or 'salterns' remain in many places, especially at Spalding and around Boston. There is a line of salterns extending several kilometres southwards from Wainfleet.

The earthworks of 17th-century English Civil War defences are preserved in many parts of the fens, especially at the river estuaries and around the Wash. In the same century, the most important phase of land claim began when the 4th Earl of Bedford gained a Royal Charter to drain the 'wastelands' to create good summer grazing. The first engineering works commenced in the 1630s, but progress was halted by the Civil War. In the 1650s, Cornelius Vermuyden, a Dutch engineer, was appointed to continue the works. Rivers were straightened to increase water flow and sluices created against tidal inflow. The Hundred Foot or Ouse Washes were created to enable temporary controlled flooding at high tides and high river levels. Through this process the North, Middle and South 'Bedford' Levels were created. At this time, the economy in the area depended heavily on fishing, especially of eels, wildfowling and mixed farming. The fiercely independent locals, known as the 'Fen Tigers', fought against the drainage works which they thought would take away their livelihoods.

As peat soil was drained, it wasted and land levels lowered, which necessitated artificial pumping. In the 18th century, wind-powered pumps covered the landscape, to be replaced by steam pumps in the 19th century which allowed the shallower open water of the meres to be drained. Whittlesey Mere was the last mere to be drained in the 19th century. Reclamation of the coastal salt marshes has also been significant, with new sea walls built to extend the rich agricultural land into the Wash resulting in loss of estuary habitats. Today, diesel and electric pumps are used to manage water levels.

The drainage was so advantageous to the productivity of the land that the former pastoral areas were converted to Grade 1 soils suitable for intensive arable, vegetable and horticultural production, with rebuilt farmsteads accommodating the yard-fed cattle whose manure further boosted fertility. The wealth created by the drainage of the area also came from new sources such as seed and bulb cultivation. The last areas to be drained were the East, West and Wildmore Fens of south-east Lincolnshire. Besides the draining of the inland fens, the reclamation of the coastal salt marshes has been significant. Council smallholdings developed as a distinctive feature of the Fens in the late-19th to mid-20th centuries.

The most noticeable change in the landscape at the end of the 20th and beginning of the 21st centuries has been caused by improved farming techniques such as trickle irrigation and the use of more precise technology. The Fens have remained mainly rural, although infrastructure – including wind turbines and rail gantries, visible from long distances – has been constructed. The bombing range at RAF Wainfleet has now closed but RAF Holbeach is still in regular use with aircraft noise carrying across wide areas. There have been recent efforts to re-create fenland to provide important habitat for rarer species and there has been focused activity on re-creating areas of wet grassland and fen, in particular at the Great Fen through the Great Fen Project, with the intention of creating an important link between Woodwalton and Holme Fens in the Cambridgeshire Fens. Partnership working elsewhere is also focusing efforts to re-create fenland to provide important habitat for rare species.

Ecosystem services

The Fens NCA provides a wide range of benefits to society. Each is derived from the attributes and processes (both natural and cultural features) within the area. These benefits are known collectively as 'ecosystem services'. The predominant services are summarised below. Further information on ecosystem services provided in the Fens NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision**: Of the soils in the Fens, 87 per cent are classified as Grade 1 and Grade 2 agricultural land. The Fens NCA is one of the most important areas of food production in the UK, producing 37 per cent of our outdoor vegetables, 24 per cent of our potatoes, and 17 per cent of our sugar beet. An estimated 4,000 farms employ 27,000 people, pointing to some very intensively managed systems of food provision. Cropping includes a mix of arable crops, field-scale vegetables and fruit (for example around Wisbech). Glasshouses, polytunnels and plastic sheeting are a feature on the productive soils and multiple cropping is often undertaken with irrigation to satisfy market forces. This can place significant stress on soil and water resources.

- **Water availability:** There are a number of major rivers in the NCA, including the Great Ouse, rising on the Yardley–Whittlewood Ridge on the Northamptonshire–Buckinghamshire border, and the Nene and Welland, which rise in the Northamptonshire Uplands NCA. Small parts of a number of major aquifers fall just within the Fens NCA boundary. Where catchment abstraction management strategy (CAMS) assessments have been undertaken, their status is assessed as 'no water available' in the summer months and 'water available' during the winter months. Rivers in the south and far south-east of the NCA generally have an 'over-abstracted' status. This has implications for active river processes, and the ecosystem services provided, throughout the system. Groundwater is also over-abstracted and again the underlying geology has implications for storage and yield.

- **Genetic diversity:** There are opportunities to preserve old varieties of fruit from traditional orchards for their taste, their genetic information and possible future crop breeding for resistance to diseases, for instance. A few rare breed livestock are maintained in the Fens – these are an important genetic resource.

Regulating services (water purification, air quality maintenance and climate regulation)

- **Climate regulation:** Peat deposits represent a key part of the carbon storage resource of the UK. Salt marshes and mudflats also have potential for long-term storage of carbon. Based on a review of the available literature, it appears likely that fenland peat soils are wasting at up to around 2.1 cm/year. For the surviving areas of deep peat it is estimated that the average wastage rate is around 1.5 cm/year. This is equivalent to around 9 per cent of the annual loss of organic carbon from 0–15 cm depth of all soils across England and Wales reported by Bellamy and others (2005) and about 0.3 per cent of the UK's annual industrial emissions of carbon dioxide.

- **Regulating soil erosion:** Loamy and clayey soils with impeded drainage, particularly those with a high silt content, are easily compacted by machinery or livestock if accessed when wet, increasing risks of localised water run-off. Lighter-textured, silt-rich soils are at risk of water erosion

and sediment loss where cultivated or if bare soil is exposed, but this is likely to be localised due to lack of gradients. The coarser-textured (fine sandy and silty) mineral soils are also prone to wind erosion, particularly where low in organic matter content.

The peat-rich soils in this NCA are at risk of erosion. Loss of peat soil through peat wastage as a result of shrinkage by drainage and oxidation and wind erosion of exposed soils is particularly problematic with spring-sown root cropping such as sugar beet, carrots and parsnips where land is exposed throughout the winter. Wind erosion can be a major problem – 'fen blows' during prolonged dry spells can quickly erode large quantities of soil and, if they occur shortly after seeding, can result in large economic losses.

The loamy and sandy soils with naturally high groundwater and a peaty surface and the fen peat soils typical of inland areas are permeable soils with good infiltration and therefore at low risk of water erosion (except where cultivated land is susceptible to flooding) but are at high risk of wind erosion (blowing), especially where spring-sown crops are grown. Drainage and cultivation are leading to ongoing loss (wastage) of surface peat through shrinkage and oxidation.

Water erosion of soils is an issue in the Little Ouse priority catchment with light sandy soils, under maize and root cropping. In the Lincolnshire Coast Rivers catchment, water erosion may be associated with outdoor pig rearing or intensive cereal and oilseed rape production.

Increased rates of erosion and weathering are also likely as a consequence of future climate change.

- **Regulating soil quality:** The fine, light silty fens and the dark, humus-rich peaty fens are the key natural resource of the Fens. Wastage and lowering of the inland peat areas and the gradual transformation of their soils over time from peaty to mineral dominated, together with sea-level rise in an area dominated by pumped artificial drainage, will have a major impact on the ecosystem services provided in the longer term. In some wasted peat soils, locally the subsoils become highly acidic giving rise to hard, iron-rich 'drummy' layers affecting crop rooting and growth, and for damaging iron-ochre formation which blocks drains.

- **Regulating water quality:** Excess nitrates, phosphates and pesticides have led to pollution and eutrophication in watercourses. In addition, soil erosion is identified as an issue. The Anglian River Basin Management Plan indicates that the ecological status of rivers and waterways in the NCA is either good or moderate. Owing to a range of factors (cross-compliance, Environment Agency (EA) schemes, catchment sensitive farming (CSF), technological improvements and better understanding among farmers), water quality is improving. Chemical water quality is generally good apart from sections of the Nene and Great Ouse which fail to reach good status within the majority of their lengths within the NCA. Where the groundwater chemical status has been assessed, it is rated as good.

- **Regulating water flow:** The Fens are low lying with much land below sea level. The Environment Agency flood risk map indicates that the majority of the NCA is at high risk of river and/or coastal flooding. Flood control is a key issue for most of the NCA, particularly since the major flooding events in 1953. Possible increases in precipitation associated with climate change may lead to an increase in flooding. However, most settlements are offered some protection from flooding by manmade defences on

the coast and main rivers. In addition, washlands (areas of permanent grassland deliberately flooded to prevent rivers overtopping) have been created on the major river systems.

- **Regulating coastal flooding and erosion:** The coastline within this NCA is formed of mudflats and salt marshes, which provide internationally important habitats for wildlife as well as important natural sea defences, backed by manmade coastal defences. The salt marshes are currently increasing in area, affording increased natural protection for the coastline. Over the medium and long term, it is probable that the balance of salt marsh and mudflats will change or be lost altogether through erosion, as a result of climate change, and associated isostatic adjustment will increase coastal squeeze where the salt marsh is constrained by coastal defences on its landward side. In the short term, the policy approach is to hold the existing sea bank alignments and in the medium and long term (with the risk of erosion of mudflats and salt marshes) landward realignment will need to be considered as an alternative to holding the line. Climate change presents a challenge to how we regulate/change the balance.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration**: The sense of place in the Fens is provided by the geodiversity underpinning the large-scale, flat and open landscape with long views, expansive skies and spectacular sunsets. The feeling of scale is further emphasised by the rich and varied, intensive agricultural land use that also produces strong seasonal changes from the black of bare, peaty soils to the rich colours of agriculture to the whites of winter. The feel and light in the landscape can quickly change with weather conditions. The landscape and its associated wildlife have inspired artists including Sir Peter Scott (who founded the Wildfowl and Wetland Trust) and more recently Carry Akroyd. Traditional activities such as ice skating on frozen marshes, eeling and punting through reedbeds have become even more marginalised during the 20th and early 21st centuries. Graham Swift's 1980s novel Waterland keenly identifies the changing lifestyles of fenland people.

- **Sense of history**: The Fens' distinct history and character is inextricably associated with the rich soils which are only accessible as a result of persistent efforts to drain the area. The drainage infrastructure (including the network of drainage ditches, embankments and pumping stations) provides an evident reminder of the area's reclaimed past. The sediments themselves contain a record of ancient landscape and climates, with the currently wasting peat revealing well-preserved remains of prehistoric landscapes with especially rich archaeology, including prehistoric and Roman artefacts and features found on fen margins. Diverse field patterns are being exposed, ranging from the ancient semi-regular enclosure of the settled fens to the engineered 18th-century fields of the open inland fens.

  The underlying clay has enabled a brick-making industry which has been a major part of local economies and provided much employment at the 'brick pits.'

- **Tranquillity:** Many parts of the Fens are tranquil, particularly around the edge of the Wash. The open and empty landscape means different things to different people; some can find it featureless and intimidating whereas others value the tranquillity that still persists away from the settlements and major transport corridors. Sense of tranquillity is likely to be particularly associated with the area's remaining wetland habitats, notably the large marsh areas adjacent to the Wash.

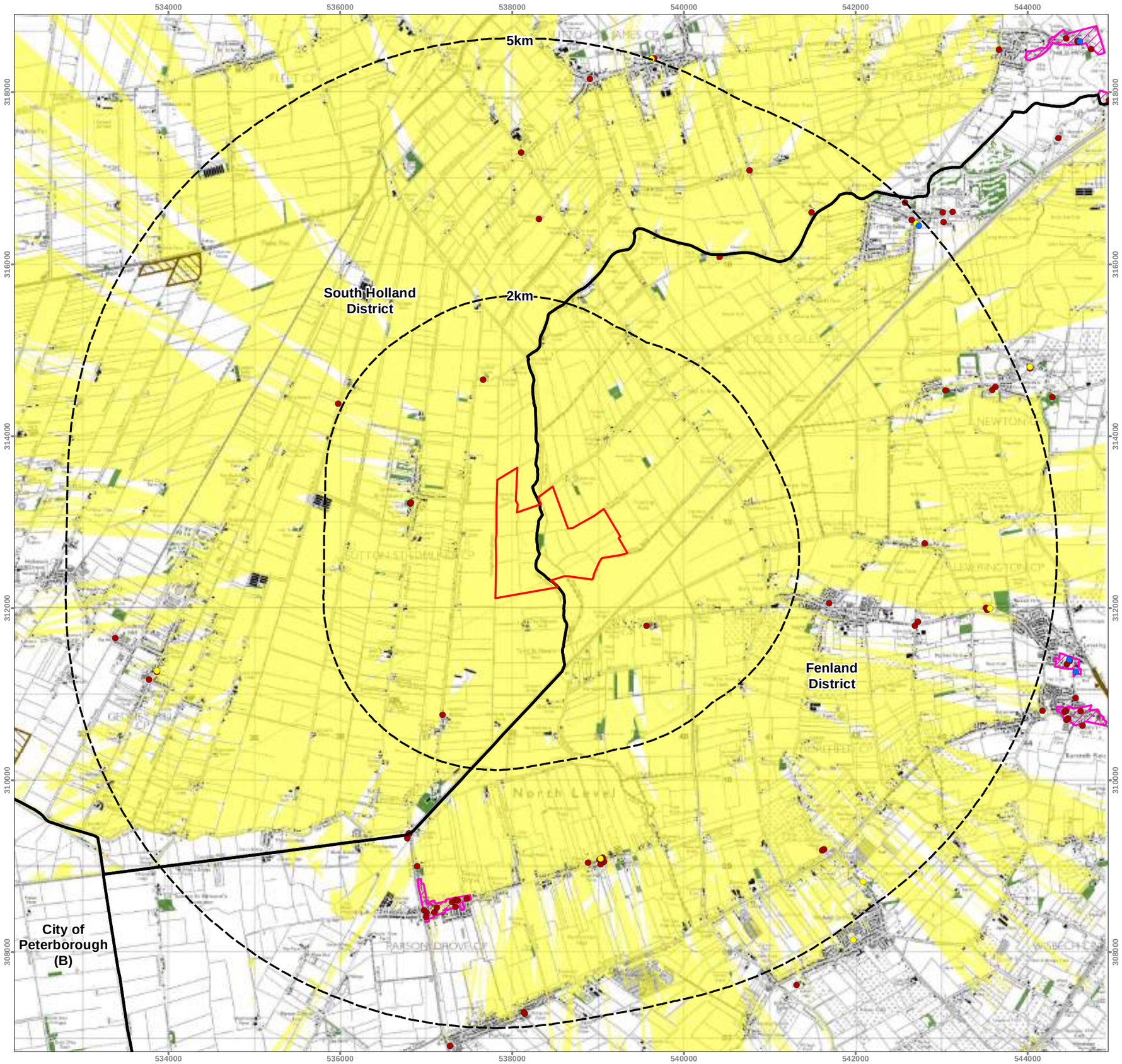
- **Recreation:** Major habitat restoration projects at Great Fen, Willow Tree Fen and Wicken Fen offer opportunities for improving and creating new access. There is a visionary long-term plan for a Fens Waterway Link joining Lincoln, Boston and Ely, which will progressively open up the Fens for boating. New national coastal access routes are planned and there are opportunities for promoting long-distance walking (such as the Ouse Valley Way, Hereward Way and Nene Valley Way). In addition to the Fens Waterway Link project, the Fens for the Future project is providing a long-term vision. Both aim to give local people a sense of ownership of their local waterways and a sense of belonging, with opportunities for recreation, enjoyment and healthy activities.

- **Biodiversity:** The Fens are particularly important in terms of their biodiversity. Areas of the Fens have been designated as Special Areas of Conservation (SAC) and Special Protection Areas (SPA) because they are internationally important for species including the spined loach. Important habitats include seasonally flooded, wet grassland such as the Ouse Washes, calcareous fen and ditches. The large embayment of the Wash, with its associated salt marsh and mudflats, provides important habitats for a number of bird species including pink-footed and Brent geese, shelduck, lapwings, oystercatchers, common terns and various plover species. The Fens are important as a feeding ground for marsh harriers; the Wash also has 90 per cent of the UK's common seals.

- **Geodiversity:** Geodiversity is also very important in determining the wider landscape and character of the Fens, from the topography to the soils. More locally, the Jurassic clays are significant for palaeontology, with major Jurassic reptiles present and many smaller fossils – ammonites, belemnites and other genera – common. Leedsichthys, the world's largest fish, was discovered in, and is still being unearthed from, these same sediments. The Quaternary deposits contain important records of climate and environmental change. These provide an important context and insight into our understanding of the potential impacts of future climate change and global warming. Several Sites of Special Scientific Interest (SSSI) have been notified for their buried Holocene (Flandrian) sediments, which record fluctuations of relative land and sea levels during the Holocene. The Ouse Washes are geomorphologically significant as a notable example of a naturally functioning flood plain system.

The famous Holme Post demonstrates the historic wastage of peat.

Appendix 7 - Screened Zone of Theoretical Visibility



Key

- Site Boundary
- Local Authority Boundary
- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Conservation Area
- Scheduled Monument
- ZTV - 4m High Development Theoretically Visible
- OS Open Map Local Buildings
- OS Open Map Local Woodland

Screened ZTV Production Information -
- DTM data used in calculations is OS Terrain 5 that has been combined with OS Open Map Local data for woodland and buildings to create a Digital Surface Model (DSM).

- Indicative woodland and building heights are modelled at 15m and 8m respectively.
- Viewer height set at 1.7m (in accordance with para 6.11 of GLVIA Third Edition)
- Calculations include earth curvature and light refraction

N.B. This Zone of Theoretical Visibility (ZTV) image illustrates the theoretical extent of where the development may be visible from, assuming 100% atmospheric visibility, and includes the screening effect from vegetation and buildings, based on the assumptions stated above.

N
GRID NORTH

0 0.5 1 1.5 2
km

PROJECT TITLE

Land East of Guanockgate Rd, Gorefield

DRAWING TITLE

Screened Zone of Theoretical Visibility Plan

SCALE			DRAWING NUMBER	
1:45,000 @ A3			BWL_026_01	
DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
AD	SW	-	-	09/09/2022

COORDINATE SYSTEM / DATUM

British National Grid / Newlyn Datum (AOD)

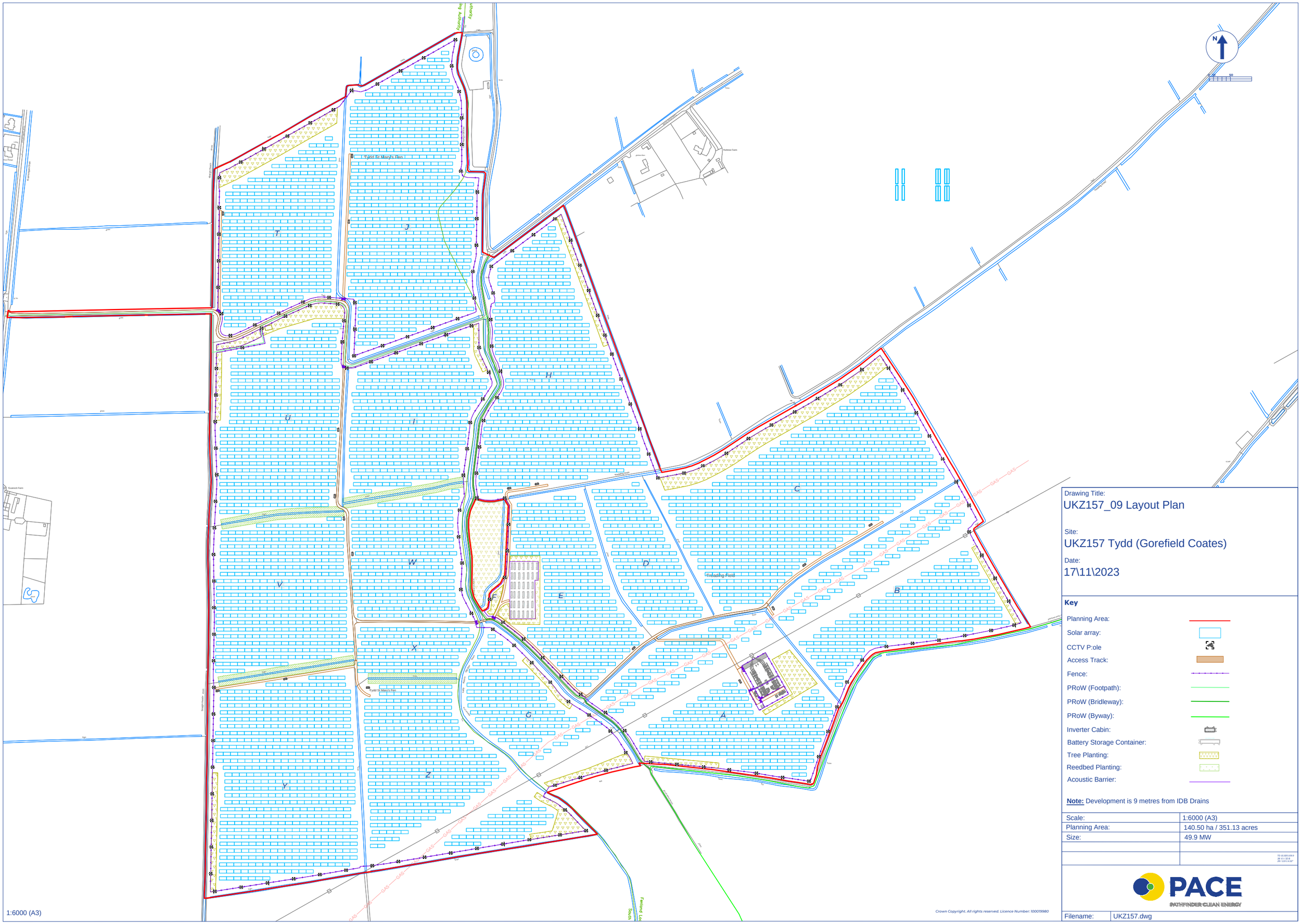
2022 Emapsite Licence number 0100061264.
Ordnance Survey Copyright Licence number 100054267.

Briarwood
Landscape Architecture

Appendix 8 – Representative Viewpoints

Presented separately alongside Figures to ES Chapter 5

Appendix 9 – Proposed Site Layout – UKZ157_09 – 17/11/203


Byway
Bridleway
Tydd St Mary's Fen
Tydd St Mary's Fen
Kettlewell Drive
Kettlewell Drive
Kettlewell Drive

Appendix 10 – Mitigation and Enhancement Plan

UKZ157_10 Mitigation and Enhancements Plan
Key
New trees with native Shrub understorey
Solar Panel
Existing Planting
Existing Hedgerows
Species rich native hedgerows
Wildflower Meadow
Deer Fence
Existing Public Right of Way
Mammal Gate
Reedbed
Site Fence
Date: 24/11/2023
Revision: V4
PACE
New trees planting with native shrub understorey around the site to help protect long range views and create new habitat.
Deer fence to protect new tree planting
Wildlife gates installed strategically along the fenceline adjacent to existing ditches, site corners and access gates
Wide corridor for public rights of way
New trees planting with native shrub understorey around the site to help protect long range views and create new habitat.
Equipment positioned at significant distance from all existing trees.
Native wildflower meadow around and underneath solar panels can be maintained by managed sheep grazing.
Site set back from ditch, restoring former reed strips creating field margins with high botanical and invertebrate interest.
Recepter Site for any captured wildlife (except hedgehogs)
New wood piles as refugia for reptiles and amphibians, positioned close to water sources.
0
500
1,000 m