Tween Bridge Solar Farm

Environmental Statement
Chapter 3: Site Description, Site Selection and Iterative Design Process

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

APFP Regulation 5(2)(a)

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3. Site Description, Site Selection and Iterative Design Process

3.1. Introduction

3.1.1. This chapter of the Environmental Statement (ES) provides a description of the Order Limits (or referred to as the 'Site') and its surrounding context. Detailed topic specific descriptions are expanded upon in the supporting ES Environmental Aspect Chapters and technical appendices. It also provides a description of the main alternatives considered, including the site selection process and the evolution of the Scheme to date.

3.1.2. This chapter includes the following sections:

- Site Description- a description of the existing conditions within the Order Limits and the surrounding areas and the key receptors that will be assessed in detail within the ES Environmental Aspect Chapters;
- Site Selection- an overview of the site selection process undertaken for the Scheme; and a description of the main alternatives to the Scheme;
- Iterative Design Process- an overview of the iterative design process undertaken.

3.1.3. This **ES Chapter 3 Site Description, Site Selection and Iterative Design Process [Document Reference 6.1.3]** is supported by the following figures as part of ES Volume 4: Figures:

- **ES Figure 3.1 Environmental Designations Plan [Document Reference 6.4.3.1]**
- **ES Figure 3.2 Design Evolution (PEIR) [Document Reference 6.4.3.2]**
- **ES Figure 3.3 Design Evolution (ES) [Document Reference 6.4.3.3]**
- **ES Figure 3.4 Local Ecological and Geological Designations Plan [Document Reference 6.4.3.4]**
- **ES Figure 3.5 Site Constraints Plan [Document Reference 6.4.3.5]**

3.2. Site Description

Order Limits Context and Description

The Order Limits

3.2.1. The Order Limits for the Scheme extends to approximately 1,831 hectares of land, presented in **ES Figure 1.1 Order Limits [Document Reference 6.4.1.1]** of which comprises the maximum area of land potentially required for the construction, operation and decommissioning of the Scheme.

3.2.2. The Order Limits is made up of five Land Parcels (described as Land Parcels A to E) as shown on **ES Figure 1.2 Land Parcel Plan [Document Reference 6.4.1.2]**, with each parcel further described in **Table 1-1** of **ES Chapter 1 Introduction [Document Reference 6.1.1].**

3.2.3. The **Land Plans [Document Reference 2.2]** show the extent of land over which rights of compulsory acquisition are sought as part of the Development Consent Order (DCO) application.

3.2.4. The Scheme has been subject to ongoing design development and the Order Limits have been refined in response to environmental and technical factors including the Environmental Impact Assessment (EIA) process, and consultation responses. This process has ensured that the Order Limits only include land which is required to deliver the Scheme.

Existing Condition within and surrounding the Order Limits

3.2.5. The Order Limits broadly lies between the settlements of Thorne and Crowle, occupying separate parcels of land within a relatively flat agricultural landscape predominantly in arable use for the cultivation of cereal crops with some areas of modified grassland and short rotation coppice. Many of the field boundaries are subdivided into rectilinear parcels by long linear drainage ditches, some with partial or sporadic hedgerows. The Order Limits is dissected by several major roads and routes, including the M180 motorway, the A18, the South Humberside Main Line railway route and Stainforth and Keadby Canal.

3.2.6. Numerous other minor roads cross the landscape connecting scattered residential properties and farmsteads, many of which lie adjacent or in proximity to the Order Limits. Tween Bridge Wind Farm and substation is situated in the northern part of the Order Limits[1]. Overhead power lines and lattice pylons runs across the northern

[1] Tween Bridge Wind Farm, also known as Tween Bridge Moor, was commissioned in 2012. It consists of 22 Vestas V90/2000 wind turbines with a combined rated output of 44 MW.

part of the Order Limits which creates other vertical elements within the landscape. There are wooden pole lines and masts within the Order Limits.

3.2.7. Bar the two areas of significant woodland to the north and south of the Order Limits associated with former peat extraction at Hatfield Moors and Thorn Moors, the landscape contains relatively limited areas of vegetation, largely limited to field boundaries in the form of hedgerows, which many are incomplete and gappy. There are occasional scattered trees or groups of trees and some small woodland copses.

3.2.8. There are a number of Public Rights of Way (PRoW) that are located within or close to the Order Limits. Public Footpath FP19 (Thorne) lies in the central northern part of the Order Limits and forms part of the access to the Scheme. Public Footpath FP15 (Thorne) lies just beyond the most north western boundary of the Order Limits. Public Right of Way (Footpath 17) lies beyond the north eastern part of the Order Limits forming a continuation of an unnamed north-east/south west Byway. Footpath 18 runs from the unnamed Byway south eastwards into the western side of Crowle.

3.2.9. **ES Figure 3.1 Environmental Designations Plan [Document Reference 6.4.3.1]** provides an overview of identified environmental constraints. Further detail on individual environmental constraints within, and outside of, the Order Limits are set out in further detail within the individual ES Environmental Aspect Chapters of this ES.

Landform and Topography

3.2.10. Landform within the Order Limits is predominantly flat and open in nature. The Order Limits is traversed by a network of network of watercourses and drainage ditches of varying scales and depths which form the field pattern and their boundaries. Some of these drainage ditches are maintained by the Internal Drainage Board (IDB).

3.2.11. The Stainforth and Keadby Canal runs through part of the Order Limits, which provides opportunity for recreation for walkers, cyclists and boat users. There is limited visibility to the north of Order Limits due to woodland and tree planting which borders the northern boundaries of the Order Limits. The topography of the wider area surrounding the Order Limits is generally low lying and displays similar characteristics to that found within the Order Limits. There are a number of drainage ditches and waterbodies scattered throughout the study areas as well as the wetland areas of Humberhead Peatlands National Nature Reserve, located to the north and south of the Order Limits.

Land use, Buildings and Infrastructure

3.2.12. The Order Limits is predominantly used for arable farming, which creates a low level patchwork appearance within the landscape. The land is made up of large scale agricultural fields often separated by drainage ditches of varying scales and depths. Some of the drainage ditches contain reed beds and associated field boundary vegetation.

3.2.13. Occasional hedgerows and woodlands define field boundaries or surrounding local farmsteads. In the northern part the Order Limits, at Land Parcel A there is woodland vegetation which separates the Order Limits from the Humberhead Peatlands National Nature Reserve at Thorne Moors. There are also occasional isolated trees along field boundaries throughout the Order Limits.

3.2.14. Tween Bridge Wind Farm and an overhead powerline and lattice pylons are located within the northern part of the Order Limits, in Land Parcel A. Both these features create tall vertical structures that contrast with the low lying landscape.

3.2.15. The Stainforth and Keadby Canal crosses through part of the Order Limits, at Land Parcel A, with both the northern and southern part of the Order Limits running along the edge of the canal, at Land Parcels A, B, and C.

3.2.16. The M180 motorway and the A18 cross the landscape in a predominantly north westerly to south easterly direction. The Order Limits run alongside these major routes and a network of minor roads which provide local access between settlements and to individual properties and farmsteads.

3.2.17. Humberside Main Line Railway line bisects through the northern part of the Order Limits in a broadly east to west direction. The Humberside Main Line Railway is predominantly outside (but adjacent) to the Order Limits, with a small section within the Order Limits boundary.

3.2.18. Urban development is largely limited to the settlements of Thorne and Crowle, with other areas predominantly consisting of isolated properties and farmsteads. There are some areas of industry located in proximity to the M180 motorway and the nearby Sandtoft Airfield.

3.2.19. To the north of the Order Limits, beyond Land Parcel A and to the east of the housing area of Moorends at Thorne, is an existing solar farm on part of the former Thorne Colliery.

3.2.20. The Humberhead Peatlands National Nature Reserve is located to the north of the Order Limits; and, to the south is the Hatfield Moors which provide large areas of wetland and wooded areas.

Landscape

Landscape Character of the Order Limits

3.2.21. The Order Limits and surrounding area located within a landscape that is characterised by open, generally low lying fields that are often bound by drainage ditches and vary in size from collections of small strip fields through to larger consolidated areas, the shapes of which reference collections of earlier groups of rectangular fields. Much of the land is characterised by arable farmland. In addition, there are woodlands and woodland blocks of varying sizes within the Order Limits and surrounding area which assist in limiting visibility particularly to the north and south of the Scheme. There are scattered trees and the occasional hedgerows which are often gappy and incomplete. The Humberhead Peatlands National Nature Reserves to the north and south of the Order Limits provide ecological habitats for birds and animals and public access for recreation. Both areas are bound by woodland and include water bodies.

3.2.22. There is the prominence of tall vertical features which include wind turbines associated with the Tween Bridge Wind Farm located within part of the Order Limits (within Land Parcel A) and exerting a visual influence across much of the remainder of the Order Limits plus a significant network of overhead power lines, their associated lattice pylons and more local power lines.

3.2.23. Transport corridors of the M180 and A18 dissect the Order Limits which run on a west to east axis. There are a network of A and B minor roads which run through or close to the Order Limits. The Stainforth and Keadby Canal cuts through the northern part of the Order Limits. The canal provides opportunity for recreational users as well as boat users of the canal. Humberside Main Line Railway line is situated north of the Stainforth and Keadby Canal and runs in a west to east direction dissecting through the Order Limits.

Landscape Designations

3.2.24. The land within the Order Limits is not covered by any designation at a national, regional or local level that recognises it as having specific landscape importance. An area of Special Landscape Value is located to the north west of Thorne, within the Doncaster district, but there is no intervisibility with this area located beyond

the M18 and the site Order Limits. An Area of Historic Landscape Interest, (The Isle of Axhole) is located to the south west extent of the Order Limits.

Registered Common Land

3.2.25. An area of Registered Common Land, identified as Thorne Moors or Thorne Waste, lies directly adjacent to the northern boundary of Land Parcel A and partly within a limited area of the Order Limits. Another small area of Registered Common Land is located to the south-east of the Order Limits, close to Land Parcel E, identified as Low Closes Turbary. An area of Registered Common Land is also located to the south of Land Parcel D, within the area identified as Hatfield Moors.

Arboriculture

3.2.26. An Arboricultural Survey has been undertaken for the Order Limits (see **ES Appendix 6.6 – Arboricultural Impact Assessment [Document Reference 6.3.6.6]**). The survey recorded 826 arboricultural features, of which 39 features (including trees, tree groups, woodlands and hedgerows) were recorded as high quality and 422 arboricultural features as moderate quality. No ancient woodland or veteran trees have been identified within the Order Limits, nor has any trees subject of a Tree Preservation Order been identified within the Order Limits.

3.2.27. The Scheme will not require the complete removal of any individual trees, or the removal of entire tree groups, woodlands or hedgerows. To facilitate the Scheme (in particular internal access tracks and culvert crossings), 49 linear meters of hedgerow and circa 8m of tree groups (4 no. semi mature, low quality trees) is required to be removed.

3.2.28. Full details of the landscape site context, description and baseline conditions are within **ES Chapter 6 Landscape and Visual [Document Reference 6.2.6].**

Ecology and Nature Conservation

Statutory Designated Sites for Nature Conservation

3.2.29. The Order Limits are situated outside of any statutory designated sites for nature conservation with the exception of a small 0.53ha area of Thorne & Hatfield Moors Special Protection Area (SPA), Thorne Moor Special Area of Conservation (SAC), Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Chase Ditches SSSI. Whilst the Moors SPA/SAC/SSSI lies within the Order Limit (Parcel A), they are outside the development footprint as it has been identified as an area for 'Indicative Area for Mitigation, Enhancement and/or Retained Agricultural Land' on **ES Figure 2.2a Indicative Operational Layout Plan**

(Fixed Solar Panel) [Document Reference: 6.4.2.2] and on **ES Figure 2.2b Indicative Operational Layout Plan (Fixed and Tracker Solar Panel) [Document Reference: 6.4.2.2]** and therefore no development work is scheduled within this designated site.

3.2.30. A further four international statutory designated sites occur within 10km of the Order Limits boundary and eight national statutory designated sites occur within 5km of the Order Limits, including Local Nature Reserves (LNR) and SSSI's The Humberhead Peatlands National Nature Reserve (NNR) is also located directly adjacent to the Order Limits boundary.

Non-Statutory Designated Sites for Nature Conservation

Ten non-statutory designated Local Wildlife Sites (LWS) fall within the Order Limits and four candidate non-statutory Local Wildlife Sites (CLWS) fall within the Order Limits.. These are all associated with 'drain' watercourses within the Order Limit, except for Whittaker's Plantation CLWS which related to plantation woodland.

3.2.31. A further two LWS, one CLWS and a Lincolnshire Wildlife Trust Reserve (LWT) are located directly adjacent to the Order Limits boundary, with a further 19 LWS, five CLWS and one Local Geological Site (LGS) situated within 2km. The locations of these Local Ecological and Geological Sites can be seen on **ES Figure 3.3 Local Ecological and Geological Designations Plan [Document Reference: 6.4.3.3].**

Habitats

3.2.32. Habitats within the Order Limits predominantly comprise arable fields (94% of the total area) that are bounded by a combination of deep drains and ditches with some hedgerows, tree lines, grassland field margins. A small woodland copse called Whittaker's Plantation is present within the centre of the Order Limits. Nine ponds are located within the Order Limits, one of which was found to be dry during surveys in spring 2023. A further 32 ponds have been identified within 250m of the Order Limits.

3.2.33. Full details of the ecology and nature conservation site context, description and baseline conditions are within **ES Chapter 7 Ecology and Nature Conservation [Document Reference 6.2.7].**

<u>Cultural Heritage</u>

3.2.34. There are no Scheduled Monuments (SM's) or Conservation Areas (CA's) located within the Order Limits. The nearest Scheduled Monument is the Peel Hill motte and bailey castle located circa 1.3km west of the Order Limits. Much of the central

core of Thorne town, to the west of the Order Limits, is within a Conservation Area. The appearance of the Conservation Area is characterised by a predominance of small scale residential and commercial properties in the main from the 18th and 19th century, although there are a few significant buildings surviving from earlier. Within the Conservation Area there are 14 listed structures. There are 32 Grade II Listed Buildings located within close proximity to the Order Limits.

3.2.35. Full details of the built heritage and archaeological assets in the site context, description and baseline conditions are within **ES Chapter 8 Cultural Heritage and Archaeology [Document Reference 6.2.8].**

Agricultural Land

3.2.36. Agricultural land can be graded according to its inherent limitations for agricultural use. Grade 1 is excellent quality and Grade 5 is very poor quality. Grade 3 is divided into subgrades 3a 'good' and 3b 'moderate' quality land. Grades 1, 2 and 3a are defined as the 'Best and Most Versatile' (BMV) in the Overarching National Policy Statement (NPS) EN-1 **[Ref.3-1]** at Paragraph 5.11.12.

3.2.37. The land within the Order Limits is mostly level, agricultural land in arable farming use (82.52% of the total area).

3.2.38. An Agricultural Land Classification (ALC) assessment (see **ES Appendix 15.1 Agricultural Land Classification [Document Reference 6.3.15.1]** was undertaken between May 2023 and June 2025 across the Order Limits. Samples were taken on a regular 200m grid for the solar panel areas, such that the survey is described as a "semi-detailed" survey. In areas proposed for fixed infrastructure where soil movement is required and accordingly there is the potential to affect land quality, additional auger sampling has been undertaken to a detailed (100m regular grid) level, such that the survey is described as a "detailed" survey. Therefore, a mix of detailed and semi-detailed ALC survey work has been completed across the Order Limits.

3.2.39. The soils across the Order Limits include some sandy and loamy medium sands, and areas where soils are clayey. The ALC classification has identified soils limited by droughtiness and soils limited by wetness.

3.2.40. The ALC survey results identify at the Order Limits 44.4% (813 ha) is BMV land, of which predominantly is Grade 3a (586 ha). The remaining Site area is non-BMV land, 55.6% (1029 ha).

3.2.41. Full details of the agricultural circumstances site context, description and baseline conditions are within **ES Chapter 15 Agricultural Circumstances [Document Reference 6.2.5].**

Water Resources

Hydrology

3.2.42. There are many field drain ditches running across the Order Limits, assumed to be used for agricultural drainage. The closest Main Rivers noted by the Environment Agency (EA) are the two drains running adjacent to the canal crossing the midsection of the Order Limits and the Hatfield Waste Drain at the southern end of the Order Limits. Ground levels on site as defined by the topographic survey are generally in the approximate range of -0.2mAOD and 2.6mAOD.

3.2.43. The latest EA published Flood Zone map (see **ES Figure 10.1 Flood Map for Planning [Document Reference 6.4.10.1]**) identifies that the majority of the Order Limits is located within Flood Zone 3, at High risk of flooding, impacted by a 1 in 200 year tidal flood event and 1 in 100 fluvial (river) event. Tidal flood risk at the Order Limits is associated with the tidally influenced River Trent. The risk of flooding from surface water shows that the majority of the Order Limits is not predicted to be impacted by a 1 in 1000 year rainfall event and has a Very Low Risk likelihood of surface water flooding. There are small areas of High to Low likelihood, predicted to be impacted by a 1 in 30 and 1 in 1000 year rainfall event, respectively, spread across the Order Limits. These 'at-risk areas' are generally isolated and associated with surface water arising within the Order Limits boundary itself.

Hydrogeology

3.2.44. Geological data held by the British Geological Survey (BGS) data show that the bedrock geology at the Order Limits is split between 'Sherwood Sandstone Group – Sandstone' in the west and 'Mercia Mudstone Group – Mudstone' in the east. It is considered likely that the sandstone in the west will be permeable, whilst the mudstone in the east is expected to be impermeable. There is potential for groundwater emergence where these two bedrocks meet.

3.2.45. The hydrogeology aquifer classification defines the western half of the Order Limits (where sandstone is generally the underlying bedrock) as a highly productive aquifer, whilst the eastern half (generally underlain by mudstone) is defined as a low productivity aquifer. As with having two different bedrocks, there is potential for groundwater emergence where these two aquifer types meet.

3.2.46. BGS record a wide range of superficial deposits at the Order Limits. These deposits include: 'Alluvium – Clay, Silt, Sand and Gravel,' 'Hemingbrough Glaciolacustrine Formation - Clay, Silty,' 'Warp – Clay and Silt,' 'Peat,' 'Glaciofluvial Deposits, Devensian - Sand and Gravel,' 'Breighton Sand Formation - Sand, Silty' and 'Sutton Sand Formation – Sand.' Any clay superficial deposits across the Order Limits are expected to restrict groundwater emergence.

3.2.47. The Soilscape soils data shows the Order Limits to be ' Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils' and 'Raised bog peat soils' and 'Loamy and clayey soils or coastal flats with naturally high groundwater.' Therefore, it can be considered that the Order Limits does not benefit from a high rate of infiltration.

3.2.48. Full details of the agricultural circumstances site context, description and baseline conditions are within **ES Chapter 10 Water Resources [Document Reference 6.2.10].**

Geology and Ground Conditions

3.2.49. The area is underlain by thick sequences of complex superficial deposits including former lake laminated silt/clay deposits, sands and gravels and infill sediments to deep glacial period channels. Thick alluvial clay and silt blankets these and overlaps marginal peat deposits. The old rivers have been historically diverted and artificial alluvium (floodwarp) deposited to provide better draining agricultural soils.

3.2.50. Surface soils are loamy or clayey, slowly to moderately permeable, or relatively impermeable and seasonally wet with impeded drainage. This helps maintain a naturally high groundwater table. There are no bog peat soils mapped. The Order Limits lie beyond the Hatfield Moors gasfield and two Petroleum Exploration and Development Licence areas cover parts of the western Order Limits. The area has a prolonged agricultural history with isolated farmsteads. Peat working is not specifically mapped but has likely occurred historically, with peat works beyond the boundaries.

3.2.51. Permeable alluvial superficial deposits typically form a Secondary A Aquifer, whilst the peat and laminated silt/clay deposits are Unproductive. Sherwood Sandstone at depth forms a Principal Bedrock Aquifer. Groundwater levels are maintained below ground level for much of the year by drainage and there is likely hydraulic continuity between groundwater and water courses. The overall level and flow will also be controlled by local factors such as former drainage courses or historical features. The western and central zones are in Source Protection Zone (SPZ) 3, due to a SPZ 1 at a pumping station 600m west of the Order Limits, and SPZ 2, 250m

West. Groundwater vulnerability to pollution is typically Medium, with parts being High where sands of the Secondary Superficial Aquifer occur.

3.2.52. Four past pollution incidents within the Order Limits are considered as plausible contaminant sources have been considered within the conceptual modelling.

3.2.53. Other potential sources of contamination identified include the former RAF Sandtoft airfield extending into the south of Land Parcel E including a possible bomb storage area, unspecified ground workings, and pumps.

3.2.54. Full details of the ground conditions circumstances site context, description and baseline conditions are within **ES Chapter 9 Ground Conditions [Document Reference 6.2.9]**.

Air Quality and Greenhouse Gases

3.2.55. The Order Limits is not located within an Air Quality Management Area (AQMA) and is approximately 7km west from the nearest AQMA, named 'North Lincolnshire AQMA', which is located in North Lincolnshire Council (NLC) administrative area. This AQMA has been declared for exceedances of the 24-hour mean PM_{10} Air Quality Objective (AQO).

1.1.1. Doncaster Council has declared eight AQMAs for exceedances of the annual mean nitrogen dioxide objective, the nearest of which, covering a section of the M18 near Bessacarr, is over 10km from the western boundary of the Order Limits.

3.2.56. The majority of the area within the Order Limits currently consists of arable land, which will have associated GHG emissions from the use of agricultural machinery; fertilisers; and transportation of goods, as well as hedgerows and scattered trees that act as a carbon sink. There are also portions of the Order Limits that contain peatland, which has the potential to sequester and store GHGs, and thus act as a carbon sink.

3.2.57. Full details of the air quality and greenhouse gases site context, description and baseline conditions are within **ES Chapter 14 Air Quality and Greenhouse Gases [Document Reference 6.2.14].**

Noise and Vibration

3.2.58. The noise climate within and in the vicinity of the Order Limits is typical of a relatively rural area, consisting of sound generated by vehicle movements along the local and more distant wider road network, existing wind turbines, birds and

wildlife, farm machinery, localised human activities and overhead aircraft movements.

3.2.59. Full details of the noise and vibration site context, description and baseline conditions are within **ES Chapter 13 Noise and Vibration [Document Reference 6.2.13]**.

3.3. Site Selection

Alternatives in EIA

Legislation, Policy and Advice Notes

3.3.1. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 **[Ref. 3-2]** (hereafter referred to as the EIA Regulations), note in Schedule 4, Paragraph 2 the following for inclusion in an ES:

"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

3.3.2. NPS EN-1 at Paragraph 4.3.9 states that:

"As in any planning case, the relevance or otherwise to the decision making process of the existence (or alleged existence) of alternatives to the proposed development is, in the first instance, a matter of law. This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option from a policy perspective…."

3.3.3. The NPS EN-1 confirms that from a policy perspective there is no general requirement to consider alternatives or to establish whether a development represents the best option.

3.3.4. There are specific legislative requirements and policy circumstances which require the consideration of alternatives. These include the requirement to avoid significant harm to biodiversity and geological conservation interests; flood risk; and development within national designated landscapes set out in respective sections 5.4, 5.8 and 5.10 of NPS EN-1.

3.3.5. Additionally, paragraph 4.3.22 of NPS EN-1 states that "*given the level and urgency of need for new energy infrastructure, the Secretary of State should, subject to*

any relevant legal requirements (e.g. under the Habitats Regulations) which indicate otherwise, be guided by the following principles set out in the NPS EN-1 when deciding what weight should be given to alternatives:

• the consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner; and

• only alternatives that can meet the objectives of the proposed development need to be considered."

3.3.6. Paragraphs 4.3.23 to 4.3.29 of NPS EN-1 go on to explain:

"the Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security, climate change, and other environmental benefits) in the same timescale as the proposed development;

the Secretary of State should not refuse an application for development on one site simply because fewer adverse impacts would result from developing similar infrastructure on another suitable site, and it should have regard as appropriate to the possibility that all suitable sites for energy infrastructure of the type proposed may be needed for future proposals;

Alternatives not among the main alternatives studied by the applicant (as reflected in the ES) should only be considered to the extent that the Secretary of State thinks they are both important and relevant to the decision;

As the Secretary of State must assess an application in accordance with the relevant NPS (subject to the exceptions set out in Section 104 of the Planning Act 2008), if the Secretary of State concludes that a decision to grant consent to a hypothetical alternative proposal would not be in accordance with the policies set out in the relevant NPS, the existence of that alternative is unlikely to be important and relevant to the Secretary of State's decision;

Alternative proposals, which mean the necessary development could not proceed, for example, because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision;

Alternative proposals which are vague or immature can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision; and

It is intended that potential alternatives to a proposed development should, wherever possible, be identified before an application is made to the Secretary of State (so as to allow appropriate consultation and the development of a suitable evidence base in relation to any alternatives which are particularly relevant). Therefore, where an alternative is first put forward by a third party after an application has been made, the Secretary of State may place the onus on the person proposing the alternative to provide the evidence for its suitability as such, and the Secretary of State should not necessarily expect the applicant to have assessed it. "

3.3.7. NPS EN-3 **[Ref. 3-3]** and NPS EN-5 **[Ref. 3-4]** are not considered to include any additional policy on alternatives to that cited above.

3.3.8. The Nationally Significant Infrastructure Projects - Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements **[Ref. 3-5]** sets out that the Planning Inspectorate considered that a good ES is one that, among other things:

"explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment."

3.3.9. This chapter has been prepared in compliance with the requirements of the EIA Regulations to provide a description of the reasonable alternatives studied by the Applicant. In complying with the EIA Regulations, this chapter is also in accordance with NPS EN-1.

Scope of Assessment

3.3.10. This chapter seeks to describe the alternatives studied in developing the siting and design of the Scheme, taking into account the requirements of the EIA Regulations and the policy position of NPS EN-1.

3.3.11. The main alternatives to the Scheme that the Applicant has considered are:

- The 'No Development' Alternative,
- Alternative Sites through the Site Selection process, and
- Alternative Designs / Layouts.

3.3.12. An important factor when considering alternatives for the Scheme is the land acquisition strategy proposed by the Applicant, which seeks to deliver the Scheme through voluntary agreement which are either agreed or are being negotiated at the time of writing. The Applicant will be seeking compulsory acquisition powers for works as fall back to ensure the Scheme can be delivered in any event.

The 'No Development' Alternative

3.3.13. The 'No Development' Alternative refers to the option of leaving the Order Limits in its current use and physical state.

3.3.14. Without development, it is anticipated that the Order Limits would continue to be primarily in agricultural use. The agricultural processes within the Order Limits may change over the next 40 years, depending on a number of factors, including the global market for products and chemical costs.

3.3.15. The 'No Development' alternative would result in the loss of opportunity for providing much needed renewable energy generation within the UK. In the British Energy Security Strategy **[Ref. 3-6]**, published in April 2022, there is the target of increasing the quantity of solar generation within the UK by 5 times by 2035. At the time of publication of the Strategy there was 14GW of solar operating within the UK, a five-fold increase on the 14GW would mean 70GW of installed capacity by 2035. Such a target will be challenging and so all opportunities and possible locations for solar farms need to be considered.

3.3.16. In July 2024, the Energy Secretary chaired their first Clean Energy Superpower Mission Board, where the drive to make Britain a clean energy superpower with a push for British-based clean, homegrown energy was continued. Following this, the Clean Power 2030 Action Plan **[Ref.3-7]** was developed in December 2024 to set out a path to decarbonise the electricity grid and strengthen Britain's energy security. The Action Plan sets the objective of reaching 45GW-47GW solar generation capacity by 2030.

3.3.17. No further assessment has been undertaken for the 'no development' scenario because this option is not considered a reasonable alternative to the Scheme as it would not deliver the additional electricity generation and electricity storage proposed.

3.3.18. As set out in NPS EN-1 at Paragraph 4.2.1, the Government has committed to fully decarbonising the power system by 2035, underpinning its 2050 net zero contributions. The Government has therefore concluded that there is a Critical National Priority (CNP) for the provision of nationally significant low carbon

infrastructure (Paragraph 4.2.4 of NPS EN-1). The Scheme (if consented) would contribute to this need.

3.3.19. NPS EN-1 notes however at Paragraph 4.2.7 that the CNP policy does not create an additional or cumulative need case or weighting to that which is already outlined for each type of energy infrastructure. The policy applies following the normal consideration of the need case, the impacts of the project, and the application of the mitigation hierarchy.

3.3.20. Not assessing the no development alternative is supported by NPS EN-1 at Paragraph 4.3.27 which states that:

"Alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision.."

Alternative Sites and technologies through Site Selection

3.3.21. This section sets out the key technical and environmental elements that were considered when determining a suitable site to accommodate the Scheme.

3.3.22. There is no standard methodology for the selection of sites for renewable energy generation projects, however, assessing the environmental impacts of a nationally significant infrastructure project (NSIP) requires consideration of how a 'site' was selected for development and how any alternatives to the Scheme were reviewed.

3.3.23. NPS-EN 1 also requires an explanation of alternatives considered when a proposal involves development of a site in a flood zone, and a **Sequential Test [Document Reference 7.11]** has been prepared separately outside the EIA process. Additionally, **ES Chapter 10 Water Resources [Document Reference 6.2.10]** of this ES demonstrates how a wide range of factors, including flood risk have been considered by the Applicant in identifying a site for development.

3.3.24. In determining a suitable location for the Scheme, the Applicant sought to develop a single new NSIP. The Applicant sought to make the most efficient use of land for renewable energy development at its existing Tween Bridge Wind Farm understanding that grid connection capacity would be available. The Applicant also wanted to build on its wider environmental and technical understanding of the Order Limits and relationships with landowners, the community and stakeholders from its operation of the existing Tween Bridge Wind Farm.

3.3.25. In making this decision, the Applicant took into account the following factors:

- Connections to Northern Power Grid for projects below 50MW would not be available in the area, so the proposals would need to be of sufficient scale to justify the cost of a connection to the National Electricity Transmission System (NETS)
- It was not possible to extend the existing Tween Bridge Wind Farm due to the effects this would have on the operational needs of Doncaster Sheffield Airport
- A solar farm would be capable of utilizing the existing land between the wind turbines most efficiently in order to generate the required amount of electricity
- Previous knowledge and experience of the Order Limits demonstrated that a solar farm could be developed while avoiding sensitive landscapes and environments
- Access for construction and operation would be readily available
- Existing landowner relationships meant that land could be acquired voluntarily

3.3.26. The location of the Scheme was then selected through a staged process to ensure that a site could be identified which would be suitable for solar energy generation and feasible to deliver, whilst avoiding and minimising the potential for harm to the environment and communities.

3.3.27. The key stages for site selection were:

- Stage 1: Identifying available grid connection capacity
- Stage 2: Land assembly.
- Stage 3: Consideration of environmental and planning constraints.
- Stage 4: Initial identification of panel areas.

3.3.28. These are described below.

<u>Stage 1: Identifying available grid connection capacity</u>

3.3.29. In order for the Scheme to be feasible, it requires a connection to the national grid through which the energy it generates would be delivered and would contribute to the national energy supply. The grid connection capacity has informed both the site location and the overall size of the Scheme, as it has been sized for the availability of this connection capacity. In doing so, it seeks to ensure that the delivery of solar energy can be provided to the national grid when the construction of the solar farm is complete.

3.3.30. The Applicant received a Grid Connection Offer in 2022 for a 340MW connection and land assembly began on this basis. In 2023, a second Grid Connection Offer increased the connection capacity to 590MW. In 2024, a third Grid Connection Offer increased the connection capacity to 800MW.

3.3.31. At the time of the first Grid Connection Offer in 2022, the point of connection (POC) was assumed to be available on or close to the land being assembled, adjacent to the existing 400kV overhead line running east-west. During 2024, the Applicant was informed that the POC location would be moved from its anticipated location due to other projects applying for grid capacity at the same location. At the end of 2024 it was confirmed likely that the POC is to be moved to the East of Area E. The likely POC and the associated 10km search area is shown on [**ES Figure 1.4 Site Selection Buffer Plan [Document Reference 6.4.1.4]**. In all cases, the POC is within close proximity of the Scheme and the Wind Farm.

3.3.32. Another factor in the availability of the POC in this location was the Applicant's ownership and operation of the Tween Bridge Wind Farm. This meant that the Scheme would be capable of co-location with the wind farm, sharing infrastructure and lowering potential environmental effects. The Applicant also had pre-existing relationships with landowners due to the Tween Bridge Wind Farm who were amenable to further development.

3.3.33. The approach to land assembly focussed on proximity to the anticipated POC and co-location with the existing Wind Farm. This approach minimised as far as possible the length of the cable corridor to the POC.

Stage 2: Land assembly

3.3.34. The Applicant began engagement with relevant landowners to receive expressions of interest. From the outset, the Applicant has sought to deliver the Scheme via landowner agreement rather than relying on executing compulsory acquisition rights. The Applicant approached landowners with a sufficient area of land for panel areas, mitigation and enhancement to enter into an option agreement. At the point of submission of the Scoping Report, approximately 1500 hectares (ha) was

sought for the generation of 600MW of electricity. Following the increase in the available grid capacity of approximately 800MW, this requirement increased to approximately 1831ha. Further land was identified and added to deliver the increased capacity.

3.3.35. The Applicant had existing relationships with landowners at the location of the Tween Bridge Wind Farm and assumed original POC location due to its development and ownership of the Wind Farm. Given the anticipated location of the POC, The Applicant engaged with these landowners first to establish whether it would be feasible to use land around the Wind Farm for the Scheme.

3.3.36. As further grid capacity was identified, engagement with landowners was focussed to the south of the Scheme, due to the constraints to the west, north and east of the original site. Section 3.4 below sets out the design iteration of the Scheme, which responded to ongoing consultation and environmental assessment.

Stage 3: Consideration of environmental and planning constraints

3.3.37. A search corridor of 10km was reviewed around the anticipated POC in order to identify potential alternatives to the land identified. This corridor was defined by the extent to which a solar farm of the proposed scale could be viable when taking into account the distance from the originally anticipated location of the POC and the cost of underground cabling. It was reviewed to confirm that the proposed location represented the most suitable alternative.

3.3.38. The analysis reviewed the following constraints within the search corridor, as shown on **ES Figure 3.5 Site Constraints Plan [Document Reference 6.4.3.5]:**

- Proximity to dwellings
- Topography
- Accessibility
- Brownfield land register (previously developed land)
- Agricultural Land Classification
- Ecological designations
    - Biosphere Reserves
    - Environmentally Sensitive Areas (ESAs)

- Local Nature Reserves (LNRs)
- Nature Improvement Areas (NIAs)
- Proposed Ramsar sites
- Ramsar sites
- Royal Society for Protection of Birds (RSPB) reserves
- Sites of Special Scientific Interest (SSSI)
- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)
- National and Community Forest

- Flood Zones
- Cultural Heritage
  - Registered Battlefields
  - Conservation Areas
  - Country Parks
  - Heritage at Risk
  - Listed Buildings
  - Registered Parks and Gardens
  - Roman Roads and Antiquity Lines
  - Scheduled Monuments
  - World Heritage Sites
- Landscape designations
  - Greenbelt
  - Area of Outstanding Natural Beauty (AONB) (now referred to as National Landscapes)

- Countryside and Rights of Way Act 2000 Designations
- National Parks

- Public Rights of Way (PRoW)

3.3.39. A map of environmental constraints is provided in **ES Figure 3.1 Environmental Designations Plan [Document Reference 6.3.3.1].**

3.3.40. In considering this, the Applicant concluded that no other available site within the search area would have lower potential environmental constraints. This was supported by the benefits of the proposed Scheme location in terms of minimising the need for a cable corridor and co-location with the existing Tween Bridge Wind Farm and making efficient use of land for renewable energy generation.

Stage 4: Initial identification of panel areas

3.3.41. Stage 2 and Stage 3 of the site selection process established that within the search corridor, there was sufficient available land, secured via agreement, located outside of major environmental and planning constraints. This was considered to fulfil the requirement to deliver a viable solar farm and the process progressed to developing an initial layout design for the Scheme.

3.3.42. The panel areas changed in response to the increased grid connection capacity. Sufficient land was identified for a grid connection capacity of 600MW, which formed the basis for the submission of the Scoping Report and non-statutory consultation. Following this, further land was added to accommodate the increase in the grid connection capacity to 800MW. Land was also removed following the non-statutory consultation in response to matters raised at consultation and ongoing environmental assessment. This version of the scheme was consulted on at statutory consultation.

3.4. Iterative Design Process

3.4.1. The Applicant has carried out statutory consultation as described in the **Consultation Report [Document Reference 5.1]** submitted as part of the application for development consent. The Consultation Report provides a detailed account of the feedback received in response to statutory consultation and how the Applicant had due regard to the matters raised. It also reports on the design changes that were implemented as a result of the feedback.

3.4.2. The Applicant has continued to engage with relevant stakeholders in finalising the design and assessment of the Scheme ahead of the submission of the DCO application

Design iteration: EIA Scoping and non-statutory consultation to Preliminary Environmental Information Report (PEIR)

3.4.3. Whilst not exhaustive, a list of the key changes made to the Order Limits and layout from the EIA Scoping stage to the PEIR is provided below. Relevant design changes numbers are shown on **ES Figure 3.2 Design Evolution (PEIR) [Document Reference 6.4.3.2]**

Table 3-1: Design Changes from EIA Scoping and non-statutory consultation to Preliminary Environmental Information Report (PEIR)

Design change number	Design Change	Reason
Area A		
1 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the north-western region Area A was inserted into the draft Order Limits. The area became part of Field A4 at the PEIR design stage.	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
2 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the western region of Area A was inserted into the draft Order Limits. The area became parts of Fields A11, A12 and A23.	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
Area B		
No design changes.		
Area C		

3 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the western region of Area C was removed from the draft Order Limits. The area was located adjacent to Double Bridges Farm.	Land was removed from the draft Order Limits owing to landscape and visual impacts on residential properties.
4 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the western region of Area C was removed from the draft Order Limits. The area was located adjacent to Clay Bank Farm.	Land was removed from the draft Order Limits owing to landscape and visual impacts on residential properties.
5 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the northern region of Area C was inserted into the draft Order Limits. The area became Field C6.	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
6 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the eastern region of Area C was inserted into the draft Order Limits. The area became Field C7, C8 and C9.	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
7 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the southern region of Area C was inserted into the draft Order Limits.	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
Area D		

8 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the western region of Area D was removed from the draft Order Limits. The area of land sits adjacent to the M180.	Land was removed from the draft Order Limits owing to landscape and visual impacts on residential properties.
9 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Area of land within the northern region of Area D was removed from the draft Order Limits. The area of land lies adjacent to an existing farmhouse.	Land was removed from the draft Order Limits owing to landscape impacts on residential properties.
10 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Areas of land within the southern region of Area D was inserted into the draft Order Limits. The areas of land became Fields D13, D1, D14 and D17	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
Area E		
11 **(shown on ES Figure 3.2) [Document Reference 6.4.3.2]**	Areas of land within the western region of Area E was inserted into the draft Order Limits. The areas of land became Fields E5, E7, E4, E6, and E8.	Land was added to the draft Order Limits to allow for the export capacity for the Scheme to increase to 800MW.
Overarching Changes		
12	Increased in MW from 600MW to 800MW and increased battery capacity from 200MW BESS storage capacity to	Owing to available grid capacity and land ownership, the Scheme was increased in capacity from 600MW to 800MW export capacity

	400MW storage capacity.	as well as from 200MW BESS storage capacity to 400MW storage capacity.

Design iteration: Preliminary Environmental Information Report (PEIR) to ES and DCO Application

3.4.4. The design of the Scheme submitted for development consent includes a number of changes made since the PEIR and statutory consultation. The design development since March 2025, resulting in the final DCO application design, has been informed by three key factors: statutory consultation feedback, landowner engagement, and further technical assessment.

3.4.5. The Applicant continued to progress technical assessment of the Scheme, both in relation to EIA and the potential effects of the Scheme on the environment and in relation to its operational function through modelling and viability testing. The technical assessment remained iterative throughout the preparation of the DCO Application, with regular reviews of any potential design changes arising as an outcome of such assessment.

3.4.6. The Applicant has also reduced the extent of the Order Limits within the eastern region of the site where it was previously anticipated the connection to an National Grid Electricity Transmission (NGET) would occur. The reason for this change between the statutory consultation stage and the DCO application was due to there being limited information over the location of the NGET 400kV Substation and subsequently the route of the 400kV from the RWE on-site 400kV Substation.

3.4.7. The key design changes made to the Scheme between PEIR publication and DCO application are summarised in below Relevant design changes numbers are shown on: **ES Figure 3.3 Design Evolution (ES) [Document Reference 6.4.3.3]**

Table 3-2: Design changes from Preliminary Environmental Information Report (PEIR) to ES and DCO Application

Design change number	Design Change	Reason
Area A		

1 **(shown on ES Figure 3.3) [Document Reference 6.4.3.3]**	Access amended into Field A6 to remove access through an existing farmhouse	Following ongoing discussions with the owners of the existing farmhouse, the design has been amended to remove the access and use the land adjacent to the farmhouse.
2 **(shown on ES Figure 2.6 Indicative Layouts and Cross Section Plans)**	Water tanks to added into the design to sit adjacent to the BESS	Following consultation with statutory consultees and technical specialists, water tanks have been provided adjacent to the BESS to provide a source of water in the event of a fire breaking out at the BESS during the operation period.
Area B		
3 **(shown on ES Figure 2.2a and 2.2b Indicative Operational Layout Plan (Fixed Solar Panel and Fixed and Tracker Solar Panel)**	Set back of solar panels north and south of Moor Bottom Road adjacent to Fields B2, B3, B4.	The solar panels were moved back from the Moor Bottom Road owing to the existing PRoW that runs adjacent to the solar panels.
4 **(shown on ES Figure 2.2a and 2.2b Indicative Operational Layout Plan (Fixed Solar Panel and Fixed and Tracker Solar Panel)**	Movement of a construction compound area from Field B1 to Field B3	The construction compound area was relocated from Field B1 to B3 owing to B3 offering a more efficient area to store construction materials from the existing highway.
Area C		

5 **(shown on ES Figure 2.2a and 2.2b Indicative Operational Layout Plan (Fixed Solar Panel and Fixed and Tracker Solar Panel)**	Movement of a single 132kV Substation into Field C6	The location of the 132kV substation was moved to reduce technical constraints.
Area D		
6 **(shown on ES Figure 3.3) [Document Reference 6.4.3.3]**	Removal of solar panels from the northern region of Area D adjacent to Field D5 and D9.	The panels were removed to provide a larger buffer to reduce potential landscape and visual impacts on the residential receptor following feedback at Statutory Consultation.
Area E		
7 **(shown on ES Figure 2.2a and 2.2b Indicative Operational Layout Plan (Fixed Solar Panel and Fixed and Tracker Solar Panel)**	Removal of solar panels from Field E1 to provide a buffer from the residential property at Plains House Farm	The panels were removed from Field E1 to provide a larger buffer from the existing residential property
8 **(shown on ES Figure 2.2a and 2.2b Indicative Operational Layout Plan (Fixed Solar Panel and Fixed and Tracker Solar Panel)**	Access point into Field E2 amended to take access directly from the A18.	The access was amended into Field E2 which was previously proposed from Field E1 owing to technical constraints which crossing an existing ditch. The new access provides a more suitable access point during construction and operation.

Overarching Changes		
9 **(shown on ES Figure 3.3) [Document Reference 6.4.3.3]**	Removal of cable corridor search area	The uncertainty of the location of the export cable has resulted in the Applicant opting to consent the location of the export cable through a separate consent.
10 **(shown on ES Figure 2.6 Indicative Layouts and Cross Section Plans)**	Increase in footprint of the 132kV substation areas	The size of the seven 132kV substations has been increased owing to technical constraints with the area proposed at the PEIR stage.
11	Removal of EV Charging points	In response to matters raised in consultation confirming this was not desired by the local community.
12	Introduction of design option for solely fixed solar panels	This flexibility has been introduced in response to ongoing technical review of the most efficient design.

3.5. Summary

3.5.1. There are some aspects of the Scheme which are required to remain flexible into the detailed design and construction phases, following the grant of development consent. As set out in **ES Chapter 4 Approach to EIA [Document Reference 6.1.4]** this flexibility has been accounted for in the EIA process through application of the Rochdale Envelope and the use of design principles and specified parameters for the Scheme. **The Design Approach Document Appendix A: Parameters Document [Document Reference 5.6.1]** document defines the design principles

and parameters to be authorised by the DCO. This will ensure that any changes or further development of the design of the Scheme remains within the parameters assessed within this ES and delivers a high quality development in accordance with those principles.

3.5.2. This chapter sets out a description of the Order Limits. In accordance with the EIA Regulations and the requirements of NPS EN-1, this chapter also sets out reasonable alternatives studied by the Applicant in both the site selection process and in the design iteration process carried out in preparing this DCO Application. It sets out the main reasons for selecting the chosen option and how the effects of the proposals on the environment have been taken into account.

3.6. References

- Ref.3-1 : Department for Energy Security and Net Zero (2025) Overarching National Policy Statement for Energy (EN-1)
- Ref. 3-2: HMSO (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
- Ref. 3-3: Department for Energy Security and Net Zero (2025) National Policy Statement for Renewable Energy Infrastructure (EN-3)
- Ref. 3-4: Department for Energy Security and Net Zero (2025) National Policy Statement for Electricity Networks Infrastructure (EN-5)
- Ref. 3-5: PINS (2025) Nationally Significant Infrastructure Projects - Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements
- Ref. 3-6: Department for Energy Security and Net Zero (2022) British energy security strategy
- Ref. 3-7: Department for Energy Security and Net Zero (2024) Clean Power 2030 Action Plan