



Great North Road Solar and Biodiversity Park

Environmental Statement

Volume 2 – Chapters

Chapter 4 – Alternatives

Document reference – EN010162/APP/6.2.4

Revision number 1

June 2025

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, APFP Regulation 5(2)(a)

Contents

4.1	Introduction	2
4.1.1	Need for the Development	3
4.1.2	Consultation	4
4.1.3	Non-Statutory Consultation	11
4.2	Alternatives to the Development	11
4.2.1	Do Nothing Scenario	11
4.2.2	Alternative Locations for the Grid Connection Point	12
4.2.3	Alternative Technologies	12
4.2.4	A Smaller Solar Park	13
4.2.5	Grid Connection Alternatives	13
4.3	Site Selection	14
4.3.1	Stage 1: Identification of Site Search Area	14
4.3.2	Stage 2: Preliminary Constraints	15
4.4	Design Evolution	17
4.4.1	Stage 3: Land Assembly	17
4.4.2	Stage 4: Scoping Order Limits	18
4.4.3	Stage 5: Scoping to PEIR Order Limits	20
4.4.4	Stage 6: PEIR to Environmental Statement (ES) Order Limits	23
4.4.5	Summary	26
4.5	Post-consent Delivery	26

4.1 INTRODUCTION

- 1 This chapter of the Environmental Statement (ES) provides an overview of alternatives considered by the Applicant including the site selection process undertaken to identify the Development. It also provides a description of the evolution of the Development design up to the point of application submission.
- 2 This information meets the requirements of Regulation 14(2)(d) of the EIA Regulations¹ which states that an ES should include:
 - 3 *"a description of the reasonable alternatives studied by the applicant which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment"*.
- 4 This chapter includes the following sections:
 - Introduction. This includes a summary of relevant consultation comments;
 - Alternatives to the Development. Summarising fundamentally different scenarios, including doing nothing, alternative locations, alternative technologies and a substantially smaller solar park;
 - Site Selection. An overview of the site selection process undertaken for the Development;
 - Design Evolution. A description of the iterative design process undertaken for the Development and how it has responded to consultation comments; and
 - Post-consent Delivery. A summary of the further design process that will take place after consent.
- 5 These four sections combined provide the information required by the EIA Regulations, explaining why this site (rather than others) was selected, the reasons for this, and why the Development is designed in this way, rather than alternative ways. The process of developing detailed proposals for a large-scale solar and biodiversity park does not lead to simple alternatives; a continuum of alternatives exists, out of which the location and layout of the Development are selected. The selection and design process therefore implicitly states why other locations and layouts were not selected.
- 6 The chapter is supported by the following figures provided in Volume 2:
 - Figure 4.1a – Planning and Environmental Designations (sheet 1) [EN010162/APP/6.3.4.1.1]
 - Figure 4.1b – Planning and Environmental Designations (sheet 2) [EN010162/APP/6.3.4.1.2]
 - Figure 4.2: Site Selection - All Preliminary Constraint Considerations [EN010162/APP/6.3.4.2]
 - Figure 4.3: Site Selection - Physical and Developer Considerations [EN010162/APP/6.3.4.3];
 - Figure 4.4 Site Selection - Landscape and Visual Considerations [EN010162/APP/6.3.4.4];

¹ HMSO (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/572/regulation/14> [accessed on 06/12/2024]

- Figure 4.5 Site Selection - Heritage Considerations [EN010162/APP/6.3.4.5];
 - Figure 4.6 Site Selection - Land Use Considerations [EN010162/APP/6.3.4.6];
 - Figure 4.7 Site Selection - Hydrology Ecology and Geology [EN010162/APP/6.3.4.7];
 - Figure 4.8a: Design Evolution – Preliminary Environmental Information Report (PEIR) [EN010162/APP/6.3.4.8.1];
 - Figure 4.8b: Design Evolution – Changes from Scoping to Preliminary Environmental Information Report (PEIR) [EN010162/APP/6.3.4.8.2]
 - Figure 4.9a: Design Evolution – Environmental Statement (ES) [EN010162/APP/6.3.4.9.1];
 - Figure 4.9b: Design Evolution – Changes from Preliminary Environmental Information Report (PEIR) to Environmental Statement (ES) [EN010162/APP/6.3.4.9.2].
- 7 This chapter is supported by the following Technical Appendix (TA):
- TA A4.1: Public Rights of Way Strategy.
- 8 A glossary of terms is provided in ES Chapter 20, Glossary [EN010162/APP/6.2.20].

4.1.1 Need for the Development

- 9 The DCO Application is accompanied by a Statement of Need [EN010162/APP/7.2] and a Planning Statement [EN010162/APP/5.4] both of which set out the reasons why a solar PV electricity generating facility and an energy storage facility are needed in the context of the national need for renewable energy infrastructure. This chapter should be read in conjunction with those documents.
- 10 ES Chapter 6, Planning Policy, [EN010162/APP/6.2.6], Section 6.3, also sets out key policy that is relevant to the need for the Development. The most recent policy, The 'Clean Power 2030 Action Plan' (December 2024)² further reinforces that the route to a Clean Power system requires rapid mass deployment of renewable energy generation, including solar.
- 11 The Development will help the UK meet its legally binding carbon emissions targets and has the potential to support the operation and balancing of the National Electricity Transmission System through the delivery of an integrated electricity storage capability. This smart demand management has the potential to support further decarbonisation of the electricity sector through facilitating greater use of renewably generated electricity during peak periods.

² UK Government (Dec 2024) 'Clean Power 2030 Action Plan: A New Era of Clean Electricity' Available at: <https://assets.publishing.service.gov.uk/media/677bc80399c93b7286a396d6/clean-power-2030-action-plan-main-report.pdf> (Page 28) (accessed on 23.04.25)

- 12 As well as addressing the requirements of the EIA Regulations set out in section 4.1 of this chapter, this chapter addresses the requirement set out in section 3.3, Alternatives, of NPS EN-1³.

4.1.2 Consultation

- 13 Table 4.1 summarises comments relating broadly to site selection, design, and alternatives from consultees to the Scoping Report and to the Preliminary Environmental Information Report (PEIR). These are referred to as “Scoping” and “PEIR”, respectively.
- 14 Consultation undertaken throughout the development process, up to the point of application submission, included:
- Discussions with landowners;
 - Environmental Impact Assessment (EIA) Scoping;
 - Engagement directly with key stakeholders (Newark and Sherwood District Council, Nottinghamshire County Council, Parish Councils, Environment Agency, Natural England, Historic England, National Highways and others);
 - Non-statutory consultation (which mirrored the statutory process) in January-February 2024;
 - Statutory consultation on the PEIR, in January – February 2025; and
 - Targeted consultation on changes to proposed access routes and points in the northeastern area in May-June 2025.
- 15 Wherever direct requests were made for design changes, these were considered by the project team and provisional amendments were identified where these were consistent with the design principles and proportionate. Where large-scale changes have been made to the layout in response to consultation comments, these are noted in Section 4.4.

³ Department for Energy Security & Net Zero (November 2023) Overarching National Policy Statement for Energy (EN-1). Available here <https://assets.publishing.service.gov.uk/media/65bbfbd709fe1000f637052/overarching-nps-for-energy-en1.pdf> (accessed 01.05.25)

Table 4.1: Consultation Responses Relating to Site Selection, Design and Alternatives

Consultee and Stage	Comment	How This Is Addressed in the ES
Planning Inspectorate - Scoping	The ES should provide a detailed explanation as to how the site selection principles have been used to identify the land and proposed layout within the boundaries of the Proposed Development.	Section 4.3 of this chapter sets out the site selection process, and Section 4.4 of this chapter sets out the process of refining the Order Limits and the layout within the Order Limits. There are three key stages, Scoping Order Limits, PEIR Order Limits and ES Order Limits.
Newark and Sherwood District Council (NSDC) – Scoping	In the absence of an outline/summary of the reasonable alternatives considered, NSDC is concerned the Applicant has not duly considered this requirement of the EIA Regulations from the outset.	There is no requirement in the EIA Regulations for alternatives to be set out in the Scoping Report. Alternatives are summarised in this chapter, as required by the EIA Regulations, in Sections 4.3 (Site Selection), 4.4 (Design Evolution) and 4.2 (Alternatives to the Development).
NSDC – Scoping	It is clear that a number of aspects of the Development in terms of its design are yet to be determined. Consequently, the ES should detail any alternatives considered within this section.	Alternatives are summarised in this chapter, as required by the EIA Regulations, in Sections 4.3 (Site Selection), 4.4 (Design Evolution) and 4.2 (Alternatives to the Development).
Laxton and Moorhouse Parish Council – PEIR	The East Midlands is not a good area for solar farm placement. Placing the same array in other areas would experience greater irradiated solar energy for more sunshine hours per year. As an alternative to farmland, there is extensive commercial south facing roofing which could be employed for solar capture and their distributed nature would	The Development is viable in its proposed location, as set out in Section 4.3. The Applicant believes that solar PV should also be located on residential and commercial roofs, where suitable, but that an 800 MW (AC) solar development could

Consultee and Stage	Comment	How This Is Addressed in the ES
	lessen the need for significant distribution infrastructure upgrades.	not viably be distributed across roofs within the search area. There is no requirement for infrastructure upgrades in utilising a spare connection bay at the National Grid Staythorpe substation and this, therefore, avoids these additional associated environmental and financial grid costs (which affect the ultimate cost of energy to the consumer).
Laxton and Moorhouse Parish Council – PEIR	The whole of the area surrounding Moorhouse and Laxton are ancient and continued use farmland. In medieval times the whole of Laxton and Moorhouse Parish was strip farmed with maps from the 1600's detailing land use held in Laxton Church and in the Bodleian Library. Laxton still operates a strip farming system under the Court Leet which is protected by a parliamentary undertaking given by the Thoresby Estate. The identified fields listed above form part of the historically sensitive East Nottinghamshire landscape and should be spared from development which would change its historic and agriculturally important nature.	The area used by Laxton's strip farming system has been avoided from the outset of the Site Selection as set out in Section 4.3.1. It will not be affected by the Development and is outside the ES Order Limits, as shown on Figure 7.3 [EN010162/APP/6.3.7.3].
Laxton and Moorhouse Parish Council – PEIR	The parish council requests that the impact on the hamlet of Moorhouse is specifically considered and addressed.	The assessment of effects of construction, operation and decommissioning of the Development has considered the whole Development, including Moorhouse. The assessments are presented in the technical chapters (7 to 19) of the ES [EN010162/APP/6.2.7-19].

Consultee and Stage	Comment	How This Is Addressed in the ES
Norwell and Norwell Woodhouse Parish Council – PEIR	This proposed development differs from the majority of solar plant designs in that it is not one area of contiguous fields, but a number of islands of land connected by fields which will be used for underground cabling.	This is not entirely correct. Several other large solar applications have had a similar, non-contiguous, layout, such as Byers Gill and Botley West. Section 4.3, Site Selection, and Section 4.4, Design Evolution, explain the rationale for the shape and form of the Development.
Norwell and Norwell Woodhouse Parish Council – PEIR	If the areas in Flood zones 2 and 3 were removed as planned panel fields, the project could still progress but in a different design. That might involve more cabling, but that design precedent has already been set in these plans.	All solar PV has been removed from flood zones 2 and 3 since the design published in the PEIR.
Carlton on Trent Parish Council – PEIR	The development is far too large and with no discernible evidence of there being any reduction in size despite many responses to the previous consultation objecting to the size.	The aim of the Development was to develop a solar farm with export capacity of 800 MW (AC). The approach to the scale and design evolution of the Development is set out in this chapter. The scale of the Development is not, in itself, an impact. Notwithstanding this, there have been substantial reductions in areas of land proposed for solar PV at each stage of the design evolution, as set out in Sections 4.3 and 4.4.
Maplebeck Parish Council – PEIR	It was a unanimous agreement that all residents felt the proposed Great north Road development was too large.	The design evolution of the Development is set out in Section 4.4. There has been substantial reduction in size following the design published in the PEIR, as shown on Figure 4.9b [EN010162/APP/6.3.4.9.2].

Consultee and Stage	Comment	How This Is Addressed in the ES
South Muskham and Little Carlton Parish Council – PEIR	Questions as to need, positioning of the planned solar arrays along with the reality of the actual ecological benefits to this area are not addressed well enough in the proposal and leave many questions and worries unanswered.	The need for the Development is set out in the Planning Statement and Statement of Need, submitted with the application. The ecological benefits are set out in ES Chapter 8, Ecology and Biodiversity [EN010162/APP/6.2.8] Solar PV has been removed from the immediate vicinity of South Muskham and Little Carlton, for the reasons set out in Section 4.4.4, but the mitigation and enhancement areas have been retained. Details of the management of these ecological areas are provided in the oLEMP (TA A5.1 [EN010162/APP/6.4.5.1]).
NSDC – PEIR	In relation to Chapter 4 (Site Selection and Design) we note and understand the requirement to consider ‘reasonable alternatives’ as required by Regulation 14(2) (d) of the EIA Regulations. In this regard, we look forward to considering in more detail any alternative options i.e. more specific areas of land and/or a scale of development that may offer a reduced effect on the environment, in comparison to the proposed development as assessed in the final version of this chapter, when presented as part of the Environmental Statement (ES).	This is noted. This chapter contains more detail on alternatives considered, and the environmental aspects affected by the decisions between these alternatives.
NSDC – PEIR	NSDC would also ask the Applicant in responding to the consultation to consider the extent of the ‘Order Limits’ as currently drawn. Whilst noting that there may be a need for	This is noted. The layout as presented in the PEIR represented the layout at that time. Not all elements had been finalised,

Consultee and Stage	Comment	How This Is Addressed in the ES
	<p>flexibility as is the norm for DCO projects, the extent of this area should be carefully reviewed from the perspective of rationalisation and the Applicant should only be seeking land on a permanent and a temporary basis that is strictly necessary for the delivery of the project. There are a number of areas within the Order Limits that do not contain Solar Arrays or associated development (including mitigation). Whilst some linear areas may be needed for vehicular access purposes, there are a number of areas where no specific development is currently defined. Such areas should be clarified and/or removed from the scheme as the design is developed further following the statutory consultation period.</p>	<p>partly in order to leave potential to refine the layout in response to consultation comments on the PEIR (such as are set out in this table).</p> <p>The design evolution of the Development is set out in Section 4.4. There has been substantial reduction in area of the ES Order Limits following the design published in the PEIR, as shown on Figure 4.9b [EN010162/APP/6.3.4.9.2].</p>
NSDC – PEIR	<p>Figure 5.2 – Sheet 1 – It would appear that Solar Array area DB002 is close to being within 100m of the nearest residential properties to the south (fronting Broadgate Lane). NSDC note that within the Design Approach Document, areas within 100m of residential buildings are ‘not preferred.’ NSDC considers that such proximity should also apply to the private amenity areas of residential properties also (not simply the houses). The Applicant should consider whether this is an acceptable relationship from a residential visual amenity perspective.</p>	<p>The Design Approach Document, as issued as part of the PEIR, identified some “hard” constraints and some “softer” constraints, as indicated by the word “preferred”. This was to identify broad areas of search, rather than for scheme design. At scheme design stage, specific assessments informed the design, and a specific distance from residential properties was not used (other than for a minimum distance for substations and construction compounds, as set out in Chapter 5, Development Description, [EN010162/APP/6.2.5].</p> <p>Specifically for the case highlighted in this consultation comment, changes to the design for other environmental reasons</p>

Consultee and Stage	Comment	How This Is Addressed in the ES
		have removed solar panels from these areas.
NSDC – PEIR	It would be useful for the Applicant to provide more information on land that was discounted for inclusion based on unwillingness from a landowner, that may have been preferable from a reduced impact perspective. This issue links into a wider point on the Applicant's regulatory obligations on the consideration of alternatives as mentioned earlier in this correspondence. As such, further details of land discounted and/or excluded based on the criteria identified would provide a more informed understanding on the evolution of the scheme proposals. It may also assist the Applicant in explaining and justifying that the scheme presented at this stage generates the 'least' environmental impacts.	<p>The Applicant has set out decisions on land inclusion where landowner willingness was a factor, as well as detailing where the desire to retain long-term farming tenancies influenced the overall design process in Sections 4.3 and 4.4 of this chapter.</p> <p>Whilst it is clear that generating the least environmental impacts was a key design principle, there was also a preference to avoid undesirable compulsory purchase, minimising the adverse effects of imposing on unwilling landowners and maximising the socio-economic benefits of working with willing landowners.</p>

4.1.3 Non-Statutory Consultation

- 16 An initial 6-week period of non-statutory community consultation was undertaken over January and February 2024 to introduce the Development to the public, during which the preliminary masterplan was presented along with a range of other environmental and technical information relating to the Development. This included a series of public information events held in the local area and online, launch of the project website and initial engagement with a range of local organisations and public interest groups.
- 17 Following the initial consultation period an updated interim masterplan was produced to illustrate potential changes arising from feedback at this stage which was published on the project website. Feedback was collated through this period, as summarised in the Phase One Consultation Summary Report⁴, and a proactive approach to comments was taken. Wherever direct requests were made for design changes, these were considered by the project team and provisional amendments were identified where these were proportionate and appropriate.

4.2 ALTERNATIVES TO THE DEVELOPMENT

- 18 The Development is a solar and biodiversity park, with the objective of providing 800 MW (AC) of generation capacity, energy storage capacity to support the solar generation, and biodiversity enhancements to the local area on a landscape scale.
- 19 NPS EN-1 at paragraph 4.4.23 states that the decision maker: *“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 and climate change benefits) in the same timescale as the proposed development”*.
- 20 This section describes development concepts that are fundamentally different and why they were discounted as alternatives to the Development.

4.2.1 Do Nothing Scenario

- 21 This scenario involves not having a new electricity generating station connected to the National Grid Staythorpe Substation.
- 22 Not developing a new electricity generating station connected to the National Grid Staythorpe Substation is not considered to be a reasonable alternative to the Development as it would not deliver the additional electricity generation and energy storage proposed (with the associated benefits of low carbon, locally produced and low cost energy), which are required, in accordance with the need for the Development, as set out in Section 4.1.1.
- 23 The Do Nothing Scenario is used in the EIA, however. The EIA compares the future scenario in which the Development is constructed and operated, as it is described in Chapter 5, Development Description, [EN010162/APP/6.2.5] with the future scenario in which the Development is

⁴ Elements Green Trent Ltd (2024). Great North Road Solar Park: Community Newsletter and Phase One Consultation Summary Report. Available at: <https://www.gnrsolarpark.co.uk/documents> [accessed on 09/12/2024].

not constructed and operated (the “Do Nothing Scenario”). It is the relative impacts of the first scenario compared to the second, and the effects of these on environmental receptors, which are identified and assessed.

- 24 In the absence of proposals for the Development, it is assumed that the land would continue to be managed as it is currently, principally as arable farmland. The future baseline would include this, along with the effects of climate change, as set out in Chapter 15: Climate Change [EN010162/APP/6.2.15].

4.2.2 Alternative Locations for the Grid Connection Point

- 25 NPS EN-1⁵ (para 4.2.21) states that:
- 26 *“energy security and decarbonising the power sector to combat climate change ... requires a significant number of deliverable locations for CNP [Critical National Priority] Infrastructure and for each location to maximise its capacity. This NPS imposes no limit on the number of CNP infrastructure projects that may be consented. Therefore, the fact that there are other potential plans or projects deliverable in different locations to meet the need for CNP Infrastructure is unlikely to be treated as an alternative solution.”*
- 27 The Applicant has an accepted grid application to connect the Development to a 400 kV bay at the National Grid at Staythorpe Substation, with export capacity of up to 800 MW (AC). Other grid connection locations with similar export capacity potential would be considered as additional development opportunities, rather than as alternatives.

4.2.3 Alternative Technologies

- 28 Alternative low-carbon technologies for generating 800 MW (AC) and connecting this at the National Grid Staythorpe Substation, have been considered and discounted.
- 29 Nuclear development is not an alternative to this Development because of the lengthy planning and development timeframe; circa 20 years, that such a project would involve. The Development will be able to start generating electricity much more quickly with first electrical export planned for 2028 in line with the UK government’s Clean Power 2030 policy.
- 30 The local area, at an elevation of between c. 10 m and 90 m above sea level, does not have potential to raise or hold a large volume of water to an appreciable height as required to generate the kinetic energy required to drive turbines to generate 800 MW (AC) of electrical power, and therefore hydroelectric generation of this scale is not feasible. The environmental consequences of creating a large dam, losing wildlife, farming, residential properties, roads and other infrastructure, would be substantially greater than the effects assessed for the Development in this ES.
- 31 To generate this capacity with wind turbines would require c. 400 turbines at a of height c. 120 m (i.e., c. 2 MW each), or 130 turbines at a of height c.

⁵ DESNZ (2023). Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/65bbfdbc709fe1000f637052/overarching-nps-for-energy-en1.pdf> [accessed on 26/05/2025].

200m (i.e., c. 6 MW each), and there is insufficient landscape capacity and space between residential properties to accommodate these whilst meeting relevant guidelines and standards. The environmental impacts (particularly on landscape and visual receptors, heritage settings, and noise receptors) of such a wind farm would be substantially greater than the effects assessed for the Development in this ES.

- 32 The Applicant considered installing a solar PV tracker system where panels will tilt to follow the angle of the sun as well as a 'fixed' mounting frame system where panels would face south. The advantages of the tracker systems are that they create more yield per square metre of panel over the course of a day. They do, however, take up more space than fixed systems and require a larger amount of land take to install. The amount of land taken up by panels was a matter raised in consultation with the public. The Applicant decided it would be beneficial to use a smaller area of land having regard to the use of agricultural land. The selection of fixed panels was also influenced by cost, with tracker systems being more expensive, and height, with tracker systems requiring 4 m height as opposed to fixed systems which can be installed at height which can be lower overall. The fixed mounting frame was therefore considered more suitable for the Development at this location.

4.2.4 A Smaller Solar Park

- 33 Consultation responses, as noted in Section 4.1.2, have included requests for the Development to be smaller. A solar park that was smaller in area would have a smaller electrical energy generating capacity and has not been considered as an alternative. A solar park with lower energy generating capacity would not deliver the same energy benefits as the Development. The 800 MW (AC) connection is at a voltage of 400 kV, and this requires substantial investment in transformers. This means that a substantially smaller solar park would not be financially viable with this grid connection. In addition, it was considered that the area had the capacity to accommodate a large scheme, but that this would likely require a careful approach to site selection and design.

4.2.5 Grid Connection Alternatives

- 34 Two alternative options are proposed to connect the 400 kV cable to the National Grid Staythorpe Substation:
- Connect via the substation associated with a consented grid support BESS on land immediately to the west of the existing National Grid Staythorpe Substation. This grid support BESS has been granted planning consent (Newark and Sherwood District Council, planning reference 22/01840/FULM); or
 - Connect the 400 kV cable to connect directly to the National Grid Staythorpe Substation.
- 35 The need for these alternative options results from the grid support BESS not having yet been constructed. If this were to be constructed in time for the Development, then connecting via its substation allows for a shared connection, which is resource efficient and cost effective. Alternatively, the 400 kV cable could run directly to the same connection point at the existing

National Grid Staythorpe Substation. Both of these options are assessed within the DCO to allow for this flexibility.

- 36 At the existing National Grid Staythorpe Substation, the electricity would pass through new metering equipment and be connected to the existing 400 kV electrical infrastructure within the compound. This new equipment and connection would either be installed as part of the Consented Staythorpe BESS or for the Development (if it isn't installed as part of the Consented Staythorpe BESS).

4.3 SITE SELECTION

- 37 This section describes the process by which the areas of land that may be suitable for consideration as part of the Development were identified.
- 38 In order to deliver the 800 MW (AC) as per the grid connection contract with National Grid Electricity Transmission (NGET), the Development needs to provide installed DC capacity of approximately 1,120 MW, based on a 1.4 ratio for overplanting⁶. In 2021, the Applicant set a target of securing around 5,000 acres (c. 2,000 ha) of land for solar PV only, based on the assumption at the time of approximately 4.5 acres per 1 MW of solar.

4.3.1 Stage 1: Identification of Site Search Area

- 39 The starting point of the site selection process was the acceptance of the application to connect the project to the National Grid Staythorpe Substation.
- 40 From this point, a "Site Search Area" of land was identified, with areas within a 15 km radius of the National Grid Staythorpe Substation being classified as potentially suitable. Greater distances involve the laying of longer cables resulting in additional costs, transmission losses and potential for increased environmental effects. The area east of the A1 and south and east of the River Trent were also excluded due to the multiple cost and environmental factors affecting a major road cable crossing and the additional costs of crossing the Trent, owing to the complexity of the crossing, as well as risks associated with the safety and performance of the cable. The area around Laxton, classified as Historic Landscape was excluded and formed the northern/northwestern limit of the Site Search Area. Areas further to the west were classified as a higher-grade agricultural land classification on the provisional Natural England Maps⁷ and were avoided from the outset. Figures 4.1a and 4.1b [EN010162/APP/6.3.4.1.1-2] show the initial macro

⁶ DESNZ (2023), National Policy Statement for Renewable Energy, EN-3, states (page 95), that, "'Overplanting' refers to the situation in which the installed generating capacity or nameplate capacity of the facility is larger than the generator's grid connection. This allows developers to take account of degradation in panel array efficiency over time, thereby enabling the grid connection to be maximised across the lifetime of the site. Such reasonable overplanting should be considered acceptable in a planning context so long as it can be justified and the electricity export does not exceed the relevant NSIP installed capacity threshold throughout the operational lifetime of the site and the proposed development and its impacts are assessed through the planning process on the basis of its full extent, including any overplanting.'

⁷ Natural England (2023). Provisional Agricultural Land Classification (ALC) (England). Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::provisional-agricultural-land-classification-alc-england/about> [accessed on 20/06/2025].

environmental and planning considerations which defined the Site Search Area.

4.3.2 Stage 2: Preliminary Constraints

- 41 Once the Site Search Area was identified, the project design principles, environmental factors, physical constraints to solar development and developer considerations (as set out below) all informed the site selection process. These factors were primarily based on preliminary desk-based searches using available information provided by various Government Agencies. These factors were consistent with the principles for site selection set out in NPS EN-3⁸, paragraphs 2.10.18 to 2.10.48.
- 42 The outcome of this process illustrates the way in which those factors combine as a 'heat map' (see Figure 4.2 [EN010162/APP/6.3.4.2]) that shows the most suitable areas shaded green, through yellow to orange areas which are the least suitable. Areas shown in white are not suitable.
- 43 The main factors considered to create this heat map summarised as follows (these are also set out in section 3 of the Design Approach Document [EN010162/APP/5.8]):
- Physical and developer considerations (buildings, woodlands, roads, railways, watercourses, existing power lines and steep slopes);
 - Landscape and visual considerations (local landscape designations (the potential Sherwood Forest Regional Park⁹), proximity to buildings, and local plan allocations for other uses);
 - Heritage considerations (listed buildings, scheduled monuments, conservation areas, historic parks and gardens, battlefields and local heritage designations (the historic landscape at Laxton, and Sherwood Forest Heritage Area));
 - Land use considerations (parks and recreation areas, local plan allocated development sites; local plan safeguarded areas; Agricultural Land Classification (ALC) Grade 1 land; and Green Belt, minerals safeguarded areas; ALC Grade 2 land; proximity to a Public Right of Way; open access land (including commons)); and
 - Hydrology, ecology and geology considerations (Sites of Special Scientific Interest (SSSIs), SACs, National Nature Reserves (NNRs), ancient woodland, Local Nature Reserves (LNRs), flood zones 2 and 3, local wildlife sites, irreplaceable habitats (as identified within the Priority Habitat Inventory) and Local Geological Sites.
- 44 In the analysis, constraining factors were identified as: not suitable for development, best avoided, or not preferred, with areas 'best avoided' carrying greater weight than those identified as 'not preferred'. The below considerations created the composite result of Figure 4.2 [EN010162/APP/6.3.4.2] showing a heat map with all considerations.

⁸ DESNZ (2023). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: <https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf> [accessed on 09/06/2025].

⁹ After receiving the Scoping response, the Applicant was made aware that Newark and Sherwood Council was no longer pursuing the Sherwood Forest Regional Park policy.

- 45 The Physical and Developer considerations as shown on Figure 4.3 [EN010162/APP/6.3.4.3] comprise:
- Areas not suitable for development - buildings and woodlands;
 - Areas identified as best avoided - land within 15 m of woodland land within 50 m of motorways, 20 m of A roads, 10 m of other roads and within 15 m of railway lines; land within 10 m of water bodies/courses; land within 11m of 132 kV overhead lines (OHLs) 275 kV OHLs; slopes steeper than 14°; and
 - Areas identified as not preferred - north facing slopes with a gradient steeper than 5°; areas within 30 m of 400 kV pylons, and land to the south and east of the railway lines (reflecting potential difficulties with cable connections across the railway).
- 46 There are no national landscape designations (areas unsuitable for development) or Heritage Coast within the area of search. The landscape and visual factors as shown as figure 4.4 included in the analysis are as follows:
- Areas identified as best avoided - local landscape designations (potential Sherwood Forest Regional Park); and land within 50 m of residential buildings (to mitigate effects on residential visual amenity); and
 - Areas identified as not preferred - land within 100 m of residential buildings or within 100 m of local plan housing allocations (in both cases to mitigate effects on residential visual amenity).
- 47 There are no World Heritage Sites in the area of search. Heritage factors as shown on Figure 4.5 included within the analysis are as follows:
- Areas not suitable for development - listed buildings; scheduled monuments;
 - conservation areas; historic parks and gardens; and battlefields.
 - Areas identified as best avoided - local heritage designations (Historic landscape at Laxton and Sherwood Forest Heritage Area); land within 50 m of scheduled monuments, and land within 50 m of listed buildings.
- 48 Land use factors as shown on Figure 4.6 [EN010162/APP/6.3.4.6] have been included in the analysis as follows:
- Areas not suitable for development - parks and recreation areas;
 - Areas identified as best avoided - local plan allocated development sites; local plan safeguarded areas; Agricultural Land Classification (ALC) Grade 1 land; and Green Belt; and
 - Areas identified as not preferred - minerals safeguarded areas; ALC Grade 2 land; land within 5 m of a Public Right of Way; open access land (including commons).
- 49 There are no Ramsar or proposed Ramsar sites, Special Protection Areas (SPAs) or 'potential' SPAs, or 'possible' Special Areas of Conservation (SACs), in the area of search which would all have been unsuitable for development. Hydrology, ecology and geology factors as shown on Figure 4.7 have been included in the analysis as follows:
- Areas not suitable for development - Sites of Special Scientific Interest (SSSIs); Special Areas of Conservation (SACs); National Nature

Reserves (NNRs); ancient woodland; and Local Nature Reserves (LNRs); and

- Areas identified as best avoided - flood zones 2 and 3; local wildlife sites; irreplaceable habitats (as identified within the Priority Habitat Inventory) and Local Geological Sites.

4.4 DESIGN EVOLUTION

4.4.1 Stage 3: Land Assembly

- 50 The ownership of larger parcels of land within the parts of the heatmap, showing all considerations (Figure 4.2 [EN010162/APP/6.3.4.2]), with fewer constraints as per Stage 2, were identified. The land assembly involved a combination of assessment of landholdings introduced to the Applicant by land agents and land that the Applicant pursued by actively approaching landowners. This process worked outwards from the accepted grid connection point at National Grid Staythorpe Substation, favouring lower constraint / more suitable areas and with a stronger preference placed on land parcels closer to the substation. This ensured efficiency in terms of the future electrical design and use of materials for the project.
- 51 The Applicant also considered availability of land as a factor, related to socio-economic effects on farm businesses and to the level of likely local opposition to the Development that would arise from pursuing compulsory purchase because the owners were not willing to enter agreement voluntarily. A general principle included ensuring that where the Applicant could avoid impacting tenant farmers who farm the land under long term tenancies, they did so. Although there would eventually be land swaps as part of the land acquisition efforts, no farmers have ultimately been removed from their long-term tenancies.
- 52 Certain landowners were only willing to let land for underground cable purposes, but not solar PV or other above ground infrastructure, such as at the area near Earshaw Farm, between Maplebeck and Cauntton.
- 53 A few areas which could have been suitable were not reasonably available. This included the area north of Winkburn hosting the consented Winkburn Solar Farm (Planning Reference 20/02501/FULM). The area south of Cauntton, which had been also previously committed to two solar projects - Knapthorpe Solar Farm (Planning Reference 22/00975/FULM) and Muskham Wood Solar Farm (Planning Reference 22/00976/FULM). The area to the east of Kelham was also committed to a potential Solar Farm (Planning Reference 23/01837/FULM), and so was the area to the south of Norwell, associated with the proposed Foxholes Solar Farm (Planning Reference 22/01983/FULM).
- 54 Land around Ossington was generally considered suitable. However, land to the south of Ossington and the southern part of Royal Air Force (RAF) Ossington had been subject to multiple long-term farming tenancies and therefore was not readily available. Whilst the Applicant endeavoured to select the best land in environmental terms, the Applicant also considered the farming businesses and farm livelihoods, which are environmental topics assessed in this ES (see Chapter 17, Agricultural Land [EN010162/APP/6.2.17]). This was in keeping with the principle of farm

viability, sustainability and diversification, allowing some farming to continue across a land holding, with the remainder being used for solar PV in agreement with the landowner. This is consistent with Paragraph 84(b) of the NPPF in relation to rural diversification. This resulted in selection of land to the north and east of Ossington which were of equal suitability as seen on Figure 4.2 [EN010162/APP/6.3.4.2].

- 55 The most efficient, cost-effective way to develop a solar farm is designing it in one confined block, as close as possible to its grid connection. However, the Applicant sought to achieve a balance between developing the site in blocks, whilst removing the more environmentally unsuitable plots.
- 56 Initially, the Applicant was able to secure large parcels of land around Averham Park, Maplebeck and Kersall to the west. To the east, the Applicant secured larger blocks around Bathley, Cromwell and along the A1 road near Carlton on Trent.
- 57 This enabled the Applicant to rationalise the scheme and devise the initial concept of the two branches of land stretching out from the Staythorpe substation. The power generated by the solar panels is exported from the transformers located in each field at 33 kV. Given the distance of up to 15 km from the substation, the voltage would need to be stepped up as close as possible to the solar panels to minimise transmission losses. The most balanced and cost-effective way is for the Development to step up to 132 kV via intermediate substations, before stepping up to 400 kV. Cables at 132 kV typically have a rating of around 220 MW (AC). As the grid connection for the Development is 800 MW (AC), four intermediate substations would be needed to distribute the load of 800 MW (AC) allowing for a headroom (i.e., not utilising the cables at full rating to maintain their performance).
- 58 Each of the two branches would therefore house two 132 kV substations, each with an export capacity of around 200 MW (AC) to formulate the overall 800 MW export capacity. This would ensure an even load distribution across the scheme and an efficient and cost-effective electrical design. Prior to consolidating the Order Limits for Scoping, 132kV cables from each branch would feed into the Development's 400 kV substation, which at that time was located on land to the southwest of National Grid Staythorpe Substation.
- 59 The original proposed site for the BESS was later taken forward as a separate proposal pursuant the Town and Country Planning Act (1990).

4.4.2 Stage 4: Scoping Order Limits

- 60 Once land was identified and secured via commercial agreements sufficient to maximise the utilisation of the grid connection available, a suite of detailed specialist desk-based assessments and on-site surveys were commissioned to further inform the land take. Notable surveys included:
- Ecological and ornithological surveys;
 - Detailed agricultural land classification surveys;
 - Archaeological desk-based review and geophysical surveys;
 - Detailed utility searches;
 - Review of historic maps for contamination;
 - UXO searches;

- Detailed review of flood risk data; and
 - Landscape and visual site visits.
- 61 The results of the assessments were aggregated in a detailed constraints plan. This enabled a holistic, multidisciplinary review to be undertaken by environmental specialists to further identify the suitability for solar PV, cable routes (to link different solar PV areas and connect to the grid), access (for construction and maintenance), mitigation and enhancement. The range of specialists included landscape architects, heritage specialists, hydrologists, ecologists, transport consultants, air quality, noise and vibration consultants, ground investigation and soils specialists.
- 62 This was complemented by a technical review where engineering specialists ensured that the areas identified for solar PV were viable, could be connected electrically and locations were proposed for other key infrastructure including the BESS, substations and compounds. This was an iterative process with environmental and technical teams working in conjunction to define the broad parameters of the project and ultimately the Scoping Order Limits required to accommodate it. Within the Scoping Order Limits at the time of non-statutory consultation, broad Development Areas were defined as:
- Solar Areas - encompassing the solar PV arrays and associated infrastructure elements; including transformers, inverters, access tracks, fences, etc.;
 - Compounds – comprising permanent compound areas within which the BESS and substations would be built and temporary compounds used during construction;
 - Cable Areas - available for underground cables and access; and
 - Other Areas - available for environmental mitigation and enhancement (noting that this may also be included within any of the above areas) along with minor ancillary infrastructure such as access tracks.
- 63 The Scoping Order Limits including the Solar Areas are shown at Figure 4.2 [EN010162/APP/6.3.4.2].
- 64 At this stage the Development evolved into a ring shape. This was designed in order to improve the grid connectivity between all fields following input from electrical design specialists, whilst still retaining a logical and cohesive shape.
- 65 The electrical design was also further advanced, whereby a new 400 kV substation and a battery energy storage system was introduced to support the solar generation.
- 66 Following submission of the EIA Scoping Request, a preliminary masterplan was developed and presented at non-statutory consultation based on the Development Areas set out for Scoping. This included some initial refinements to solar areas arising due to technical and landowner factors, as well as the results from continuous environmental survey and assessment work.

4.4.3 Stage 5: Scoping to PEIR Order Limits

- 67 Environmental survey and assessment work was ongoing throughout the development process, increasing in intensity and focus following EIA scoping and considering the responses received from statutory consultees. Continued environmental survey and baseline assessment results fed back into the design process, generally leading to gradual reductions of the solar PV areas or increases in environmental mitigation areas as new constraints were identified.
- 68 Consultation, environmental and technical considerations all fed into refinement of the Development design.
- 69 At this design stage the preliminary works areas were set out.
- Work no. 1: Solar PV;
 - Work no. 2a Cable Route;
 - Work no. 2b Cable Area;
 - Work no. 3: Mitigation/enhancement;
 - Work no. 4: Intermediate substations;
 - Work no. 5: BESS/400 kV compound (note, these were split into 5a and 5b after PEIR);
 - Work no. 6: National Grid Staythorpe Substation and connection point;
 - Work no. 7: Consented Staythorpe BESS and Connection; and
 - Work no. 8: Access Works.

4.4.3.1 Project Name Change to GNR Solar and Biodiversity Park

- 70 Following non-statutory consultation, one of the main issues raised by the public was the potential loss of biodiversity.
- 71 Although the Applicant had always planned to offer contributions in terms of biodiversity net gain, feedback received during non-statutory consultation prompted further in-depth engagement with consultees and stakeholders including Nottinghamshire Wildlife Trust (NWT), the Royal Society for the Protection of Birds (RSPB), Sherwood Forest Trust (SFT) the Trent River Trust (TRT), Newark and Sherwood District Councillors and Natural England. These conversations led the Applicant to the idea of establishing a landscape scale biodiversity park, combining the ecological benefits that could be derived from the solar PV areas, with a substantial area of extra land procured to sit alongside the solar PV, dedicated solely to the principle of improving local ecology and wildlife for local people with a lasting legacy for residents and tourists to enjoy via access to this enhanced landscape. The Applicant then took a series of steps to realise this vision:
- The negotiation of and then signing of formal partnership agreements with four non-governmental organisations (NGOs), NWT, the RSBP, SFT and TRT, in order to ensure the Biodiversity Park could benefit from expertise, ensuring robust strategic oversight, design and implementation.
 - The Applicant formed a Biodiversity Steering Group joined by the Applicant's ecologist, the new partners organisations, Newark and Sherwood District Council, the Nottinghamshire County Ecologist and

Natural England. The group arranged meetings to feed into the design of the proposed biodiversity areas.

- The Applicant then ensured that its land agreements would allow for the establishment of conservation covenants with its landowners, meaning that Biodiversity enhancements such as woodland planting and new hedgerows could be secured beyond the life of the solar farm.
- The Applicant then decided to adopt the approach of holding on to areas of land (where possible lower agricultural land grade) when it had been deemed environmentally unsuitable for solar development and put it aside for biodiversity, with targets put in place for the creation of different ecological enhancements and means for the public to enjoy them. The proposals at PEIR included:
 - 50,000 trees, including native Sherwood Forest Oak;
 - 800 acres of mitigation and enhancement area for wetland, species-rich grasslands and riparian corridors and other biodiversity features;
 - 25 km of new hedgerow creation;
 - 19 km of new permissive footpaths;

72 The Applicant took the view that a significant Biodiversity Net Gain (BNG) aspiration should underpin the strategy¹⁰.

4.4.3.2 Strategic Changes

73 Following non-statutory consultation, changes as shown on Figure 4.8b [EN010162/APP/6.4.4.8.1] were made to multiple locations to avoid areas at risk of flooding (Flood zone 2 or 3), including areas near: Moorhouse, Cromwell, North Muskham and Bathley, Kelham, and Maplebeck.

74 Multiple areas had new woodlands proposed to further ecological enhancements, mitigate visual impacts, and to enhance the wooded character of the area. The areas in which these changes were proposed include: Moorhouse, Maplebeck, Carlton on Trent, and Norwell Woodhouse.

75 Solar areas were set back from residential properties in multiple locations in response to consultation. This was proposed for the following areas: Maplebeck, Norwell Woodhouse, Moorhouse, Carlton on Trent, Cromwell, North Muskham and Bathley, and Kelham.

76 The PEIR Order Limits were extended to the south, encompassing part of the Staythorpe Power Station site adjacent to the River Trent, to allow for the option of transporting equipment and construction materials via the river to reduce construction traffic on the local road network (Work no. 8 Access).

77 The PEIR Order Limits encompassed the consented Staythorpe BESS development (Work no. 7, Consented Staythorpe BESS), seeking additional flexibility to connect via the Consented BESS substation into the existing National Grid Staythorpe Substation.

¹⁰ Quantifying BNG is possible through use of DEFRA's BNG metric tool. This requires such a level of detail, however, that it is not practical to use this for a site of c. 2,000 ha part-way through a design process. Hence final BNG enhancement quantities were only established shortly prior to submission of the application, based on the application layout. Up to this point, the advice of the partners and ecological advisors to the project was used.

- 78 Sections 4.4.3.3 to 4.4.3.7, below, reference specific locations where changes to design have been made, with reference numbers such as 8SR39. These are labelled on Figure 4.8b [EN010162/APP/6.3.4.8.2].

4.4.3.3 Northeast Quadrant Figure 4.8b Sheet 1

- Solar areas to the east of Moorhouse were reduced primarily as a result of a more detailed hydrology assessment having been made (8SR39-8-SR45).
- Some localised changes were made to the areas to the west of Sutton on Trent and Carlton on Trent to take account of visual amenity concerns from local residents.
- Cable Route Option to the North of Norwell:
 - One of the key changes was the introduction of an alternative cable route option to the north of Norwell (8-OA6). This was introduced as a more technically suitable alternative, offering more flexibility for the cable installation. It negated the need for an extremely narrow cable crossing, containing a complex culvert and in very close proximity to a scheduled monument. It also mitigated the likely opposition to compulsory acquisition powers which would arise with an unwilling landowner.
- Changes to Access Strategy as set out in Section 4.4.3.7 below.

4.4.3.4 Northwest Quadrant Figure 4.8b Sheet 2

- Removal of solar area 8-OR6 due to proximity to ancient woodlands, as well as the limited technical viability of this field.
- Changes were made near Mainwood Farm (8-SR52) to remove a field due to its low economic viability as a very small paddock surrounded by mature trees, as well as removing part of a field at Norwell Woodhouse (8-SR48), due to the undulating nature of the field not following the wider design principles.
- There was only one small solar addition, (8-OA16), an area surrounded by solar fields, which optimised this section of solar area.
- 8-OR10 and 8-OR11 were reduced as the cable route became more defined. The cable corridor was also moved away from an existing Public Right of Way.

4.4.3.5 Southeast Quadrant Figure 4.8b Sheet 3

- 8-OR1 was removed as a cable route option due to its very narrow width at a road crossing, which posed risks for the cable installation. It also mitigated the scope of compulsory acquisition.
- 8-OA20 was added following non-statutory consultation in order to create a 30m wide wildlife corridor and connect Spring Wood and Cheveral Wood.
- 8-OA5 – addition of a small section for a potential cable route option, to provide optionality in the early stages of technical cable design
- 8-OA1 – OA3 were added to the PEIR Order Limits as works in those areas may have been required to facilitate the delivery of the 400kV transformers needed for the Development via the River Trent through the Staythorpe Power Station including Staythorpe Berth.

4.4.3.6 Southwest Quadrant Figure 4.8b Sheet 4

- Changes were made at 8-SA47 where a substation was moved from being located adjacent to the main road, to further into the field. This was based on public feedback at non-statutory consultation. The new location provides better visual screening using existing mature tree cover.
- 8-OA18 was added to the scheme to introduce two cable route alternatives in order to secure land by agreement. This was at a time when the land take for the cable at this crossing location was not conclusive, and alternatives were needed to ensure the ability to install the cables.

4.4.3.7 Updated Access Strategy

- 79 Two new access roads were added to the PEIR Order Limits following the Statutory Consultation which included passing places. These were subject to targeted consultation. For the avoidance of doubt, they are classed as PEIR additions. These changes are shown on Figure 4.8b Sheet 1 located near Weston (8-OA12, 8-OA13 and 8-OA14) and Sutton on Trent (8-OA10). One new internal access was added within solar fields north of Norwell (8-OA09) negating the need for the environmental effects created by building a new junction off the public highway.

These changes were made following public feedback and optimisation of the access strategy. The access strategy for the area of the PEIR Order Limits near Weston was amended in response to feedback from the villages of Ossington, Moorhouse and Weston. The change in approach removed the need for construction traffic to pass through these villages. It also negated the requirement for Heavy Goods Vehicles (HGVs) to use Ladywood Lane and Wadnal Lane, and the disruption to properties on these lanes that would otherwise have occurred. Traffic would instead arrive and depart to the north, to and from the B1164 near Weston. Near Sutton on Trent, traffic would instead arrive and depart to the north to and from the B1164.

4.4.4 Stage 6: PEIR to Environmental Statement (ES) Order Limits

- 80 This section sets out the consolidation of all works areas based on public and technical consultation responses, and design optimisation. Archaeological trial trenching results, as well as updated Environment Agency Flood Data have been the main environmental determinants for the changes.
- 81 At this this design stage the final works areas were defined as follows:
- Work no. 1: Solar PV;
 - Work no. 2: Cables;
 - Work no. 3: Mitigation/enhancement;
 - Work no. 4: Intermediate substations;
 - Work no. 5a: BESS;
 - Work no. 5b: 400 kV compound;
 - Work no. 6: National Grid Staythorpe Substation and connection point;
 - Work no. 7: Consented Staythorpe BESS and Connection; and

- Work no. 8: Access Works.
- 82 Improvements in panel efficiency over the years since the initial design was conceived in 2021 is another factor that has enabled the Applicant to consolidate the design and reduce land take for solar PV areas (Work no. 1 Solar PV).
- 83 In many cases removing the former Work no. 2b as defined in PEIR and refining the cable routing to a 60 m-wide corridor enabled the reduction of the ES Order Limits either side of this.
- 84 The design submitted alongside the application is also accompanied by a Masterplan (see Figure 5.2 [EN010162/APP/6.4.5.2]) including more detailed landscape and ecological mitigation and enhancement based on consultation responses. In addition, a TA A4.1 Public Rights of Way Strategy [EN010162/APP/6.4.4.1] has been set out consolidating the key design principles applied to retaining and improving access across the ES Order Limits of the Development.
- 85 Figure 4.9a shows the extent of the solar PV area at the ES design stage. Figure 4.9b shows the changes from the PEIR Design to the ES design stage. Sections 4.4.4.1 to 4.4.4.4, below, reference specific locations where changes to design have been made, with reference numbers such as 8SR39. These are labelled on Figure 4.9b [EN010162/APP/6.3.4.9.2].
- 86 The Design Approach Document [EN010162/APP/5.8] complements the comparison and shows the mitigation and enhancement design evolution. Figure 5.2 Masterplan [EN010162/APP/6.3.5.2] shows the Development's design including the main components together with the mitigation and enhancement measures. The design features:
- 64,500 proposed trees (31 ha of proposed woodland);
 - 50 km of proposed hedgerow;
 - 999 ha of Solar PV (diverse) grassland;
 - 407 ha of diverse grassland;
 - 22 ha of Ecotone;
 - 32.6 km of new permissive routes, comprising 27 new permissive routes, including 21 permissive paths and 6 bridleways; and
 - Biodiversity Net Gain comprising:
 - Habitat units +60.70%;
 - Hedgerow units +26.46%; and
 - Watercourse units +11.05%.

4.4.4.1 Northeast Quadrant Figure 4.9b Sheet 1

- 87 Two new datasets relating to the impact of climate change on flooding from the Environment Agency became available post-PIER (Trent and Tributaries 100-year plus Climate Change event, and the Flood Map for Planning Present Day Extents), which show a 1 in 100 chance flood extent for rivers. Using this and existing flooding data, all proposals for solar PV were removed from flood zones 2 and 3 which reduced the section of solar around Moorhouse Beck (9-SR25, 9-OR29, 9-OR30) and in a field near Castlehill, Carlton on Trent (9-SR19), and eliminated the field near Cromwell (9-SR10) in the south. This resulted in the removal of a large cable area 9-OR12.

- 88 Around Moorhouse, north facing solar PV fields were removed (9-SR26). North facing fields have a low solar yield and render the land more technically difficult to construct.
- 89 A 60 m cable corridor has been defined avoiding physical constraints such as pylons for overhead lines, resulting in a large portion of land around Ossington and Cromwell being removed.

4.4.4.2 Northwest Quadrant Figure 4.9b Sheet 2

- 90 Removal of solar around Caunton Lodge (9-SR32, 9SR33) due to its high potential for underground archaeology. Further solar PV reductions can be seen north of Norwell Woodhouse (9-SR29 and 9-OR44) to ensure consistency with the design principles and avoid steeper slopes on land that is not preferable, which was now achievable due to the increases in panel efficiency. Solar areas east of Kersall (9-SR30 and 9SR31) were removed to improve residential visual amenity.
- 91 A 60 m cable corridor has been defined avoiding physical constraints such as pylons for overhead lines.

4.4.4.3 Southeast Quadrant Figure 4.9b Sheet 3

- 92 The southeastern area of the project from Kelham up to Cromwell was modified and the latest iteration excludes solar PV, cable and substation options. This was because of a number of technical constraints, primarily associated with flood risk and underground archaeology. These areas include from 9-SR1 to 9-SR13.
- 93 Two new datasets relating to the impact of climate change on flooding from the Environment Agency became available post-PIER (Trent and Tributaries 100-year plus Climate Change event, and the Flood Map for Planning Present Day Extents) which show a 1 in 100 chance flood extent for rivers. Using this and existing flooding data, all solar was removed from flood zones 2 and 3.
- 94 After removing all solar PV from flood zones 2 and 3, and extensive high potential for underground archaeology being present in the same area, only a handful of carved out fields remained. These fields were removed as the small pockets of development area remaining within them after the removal of flood risk and archaeology areas rendered them economically unviable. Additionally, the railway crossing for the cable would have added cost, time and complexity to avoid potential impacts on existing Network Rail infrastructure. The cost of cabling to these pockets of solar outweighed the gain and this allowed for a logical block of solar PV area to be removed, thus requiring no further design disaggregation than was already the case.
- 95 The end result was the entire section of land to the south and west of Cromwell, and east of the East Coast Main Line being removed.
- 96 Whilst infrastructure in this area has been removed, parcels of land containing mitigation enhancement and permissive routes are retained. Some mitigation areas have been removed to allow land to remain in agriculture as less mitigation land is required following the loss in area of solar PV.
- 97 Other notable changes included:

- Removal of the land and Staythorpe berth at Staythorpe Power Station (9-OR1) as the transport strategy was consolidated and it was established that works to the area are not required to carry out abnormal load deliveries;
- Works at Staythorpe substation and associated access were defined in more detail and allowed the reduction of the works areas (9-OR4); and
- A 60 m cable corridor for the 400 kV cable has been defined avoiding physical constraints such as pylons for overhead lines. This resulted in the removal of areas 9-OR3 – 9-OR11.
- A 60 m cable corridor for the 132 kV cable has been defined and this resulted in the removal of areas 9-OR92 – 9-OR97.

4.4.4.4 Southwest Quadrant Figure 4.9b Sheet 4

- 98 No changes to the solar PV areas were made in this section.
- 99 A 60 m cable corridor was defined avoiding physical constraints such as overhead lines, combined with the reduction in cable route optionality through 9-OR80, 9-OR81, and 9-OR82. Other former cable areas removed include 9-OR72-9-OR75).

4.4.5 Summary

- 100 As noted in consultation comments (see Section 4.1.2), the Development differs from the layouts of some other large solar proposals in the UK in that it is not one area of contiguous fields, but a number of islands of land connected by fields which will be used for underground cabling and biodiversity enhancement. To minimise cost and maximise operational efficiency, the Development would be located as close as possible to the Staythorpe substation and aggregated into a single area, and this would therefore be a preference. However, other, principally environmental, factors influence design as explained above. The culmination of consideration of these factors leads to the proposed layout.
- 101 By applying the approach set out in Section 4.3 to identify potentially developable land, and then the evolution process set out in Section 4.4 to optimise the layout of components of the solar park within this, a wider area overall area has been included (as indicated, for example, by the furthest distance between two points within the Order Limits, which is c. 15.5 km). This has allowed the selection of land that leads to lower overall environmental impact than would be the case if all solar areas were aggregated together.

4.5 POST-CONSENT DELIVERY

- 102 The detailed design for the Development would be delivered post-consent, pursuant to the discharge of DCO Requirements.