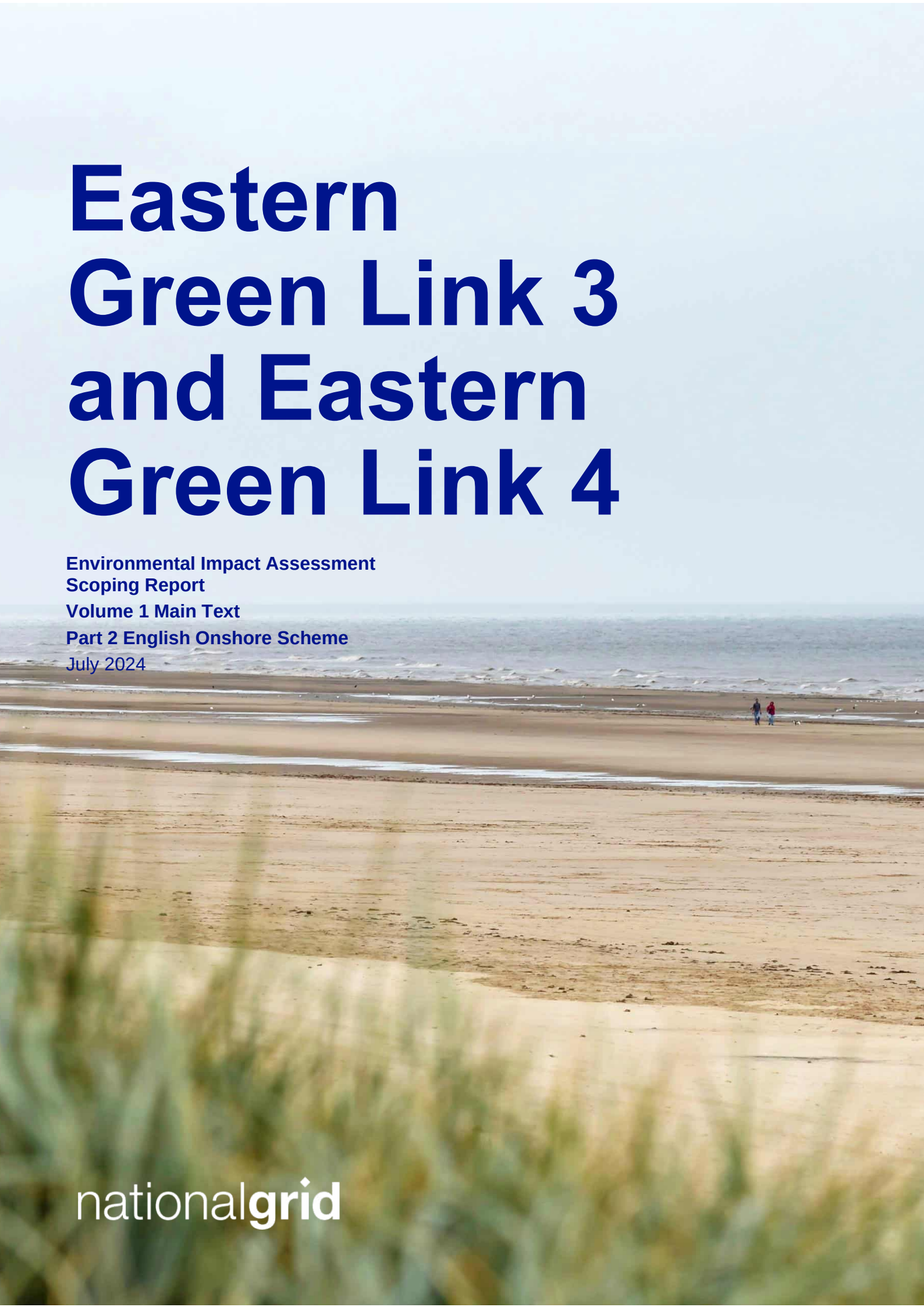
Eastern Green Link 3 and Eastern Green Link 4

Environmental Impact Assessment
Scoping Report
Volume 1 Main Text
Part 2 English Onshore Scheme
July 2024



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3. Consideration of Alternatives

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3. Consideration of Alternatives

3.1 Introduction

3.1.1 This chapter describes how the English Onshore Scheme has been developed in response to the identified need case and secondly, how the English Onshore Scheme has evolved and the alternatives that have been considered taking account of NGET's statutory duties under the Electricity Act 1989.

3.1.2 This chapter will also provide a description of the reasonable alternatives identified and assessed by NGET which are relevant to the English Onshore Scheme and its specific characteristics, and the main reasons for the option chosen, taking into account a number of different factors including potential impacts on the environment.

3.1.3 This chapter should be considered alongside **Volume 1, Part 3 English Offshore Scheme, Chapter 19: Consideration of Alternatives** of this Scoping Report.

3.2 Consideration of alternatives

3.2.1 Schedule 4 of the EIA Regulations states that an ES should include:

"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."

3.2.2 Whilst there is no statutory requirement to include an assessment of alternatives in support of a request for a Scoping Opinion, the Planning Inspectorate's Advice Note Seven recommends that a Scoping Report includes "*an outline of the reasonable alternatives considered and the reasons for selecting the preferred option"*.

3.3 NGET's Approach to Consenting

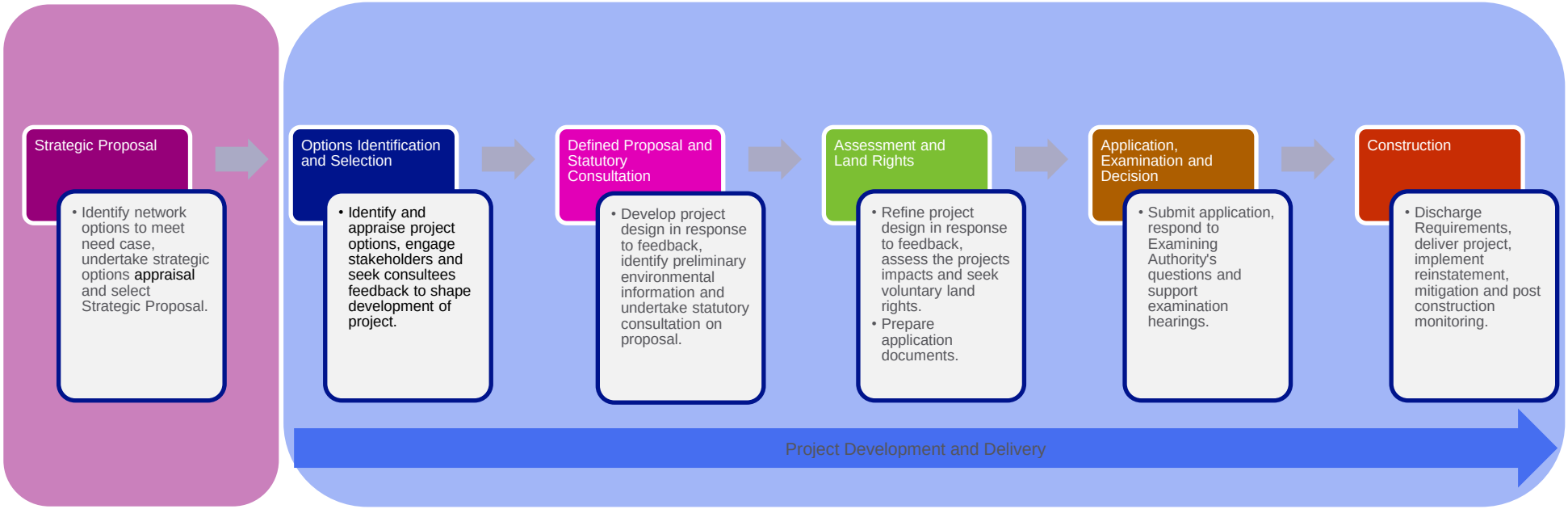
3.3.1 NGET's Approach to Consenting (Ref 3.1) outlines development process for major infrastructure projects, from initial inception to consent and construction. NGET's Approach to Consenting comprises the following six stages:

- Stage 1: Strategic Proposal;
- Stage 2: Options Identification and Selection;
- Stage 3: Defined Proposal and Statutory Consultation;
- Stage 4: Assessment and Land Rights;
- Stage 5: Application, Examination and Decision; and
- Stage 6: Construction.

3.3.2 **Figure 3.1: NGET's Approach to Project Development and Delivery** presents an overview of NGET's approach to project development and delivery; a summary of the main objectives of this stage of the consenting process can be seen below that stage.

3.3.3 The first two stages (Strategic Proposal and Options Identification and Selection) have informed the identification of the English Onshore Scheme. At each of these stages, NGET has considered a range of engineering, economic, environmental and social factors consistent with its statutory duties. In addition, non-statutory consultation has been undertaken with stakeholders, landowners and members of the public between 23 April 2024 and 15th July 2024 providing the opportunity to provide feedback on the English Onshore Scheme. Responses received from the non-statutory consultation will inform how potential effects may be mitigated and if required, the design may be updated as a result. Statutory consultation on the evolved proposals will take place in 2025.

Figure 3.1: NGET's Approach to Project Development and Delivery



3.4 Strategic Proposal

3.4.1 Following the ESO's recommendation for two new 2 GW HVDC links, NGET undertook additional network studies (Ref 3.2), documented in a strategic options report (SOR), to evaluate the impact on the existing transmission system in England and Wales, and to confirm which connection point provided the best value to customers whilst minimising potential environmental and socio-economic impacts. As stated in the needs case for EGL 3 and EGL 4 (as described in the SOR), two issues were identified both of which need to be resolved:

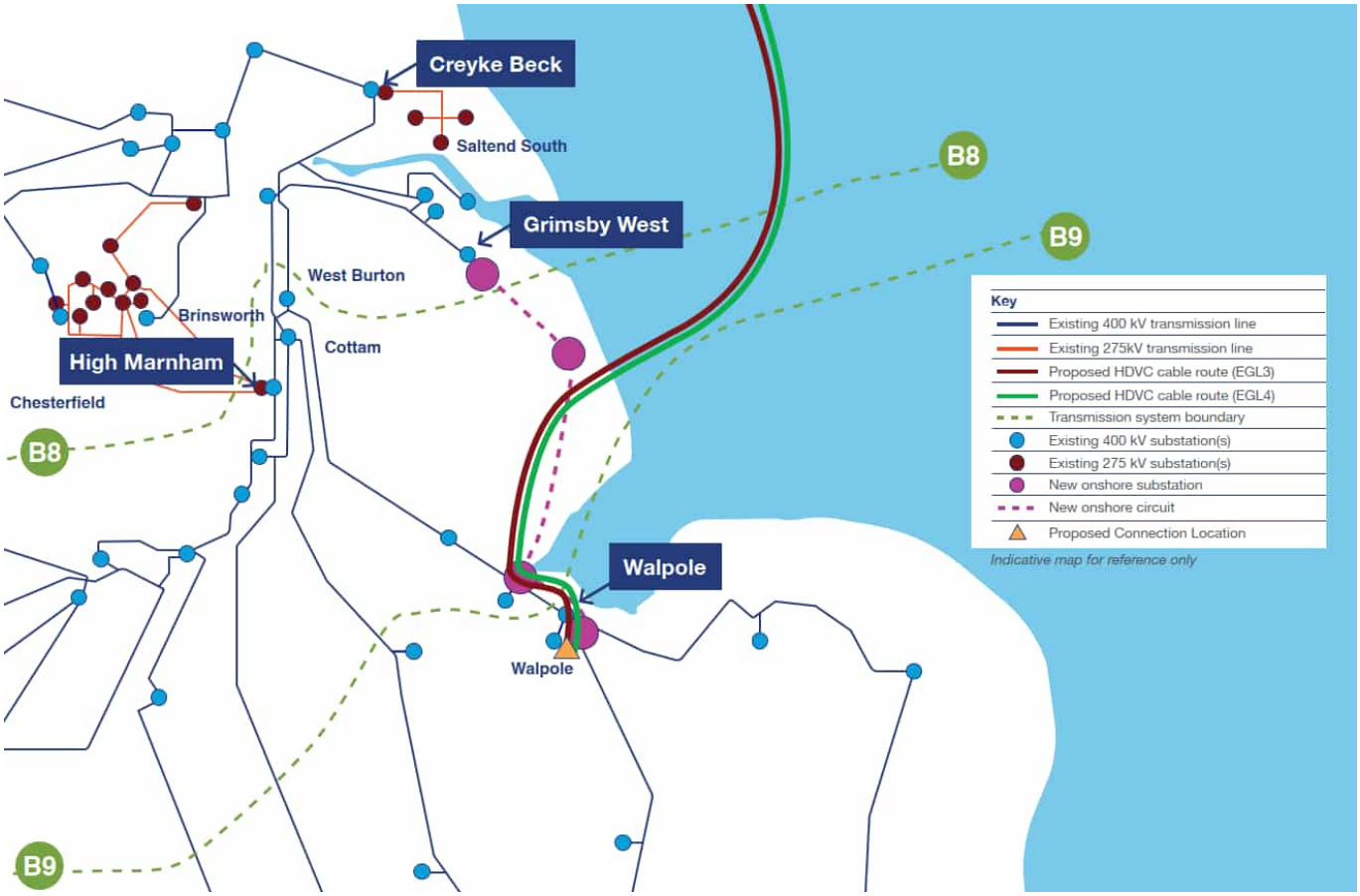
- Part One: Provide >10 GW of capacity across the B6, B7a and B8 system boundaries (see **Figure 1-4 Network Transmission Boundaries**); and
- Part Two: Provide >6 GW of capacity across the B9 system boundary (see **Figure 1-4 Network Transmission Boundaries)** for future generation growth resilience.

3.4.2 A number of potential strategic options were identified which could meet NGET's need case for EGL 3 and EGL 4 as well as to enable NGET to meet its statutory duties. Initially a 'long list' of options were identified connecting a number of potential 'start' and 'end' points. These included connection points at, or close to, existing or already planned substations. These options were then appraised and filtered to obtain a short list of options, which were subject to a detailed appraisal against a range of technical, socio-economic, environmental, cost and programme issues.

3.4.3 The strategic options assessment identified a Strategic Proposal comprising EGL 3 and EGL 4 HVDC links south of the B9 transmission boundary to or near to a Main Interconnected Transmission System substation (identified as a proposed new substation at Walpole). This is referred to as EGL Option (OPP) 6 (new Walpole substation), in the SOR, and is shown below in **Figure 3.2: EGL OPP6 New Walpole Substation potential strategic option.**

3.4.4 The proposed new Walpole substation is identified as a common connection point for the OPP6 and the Grimsby to Walpole Project (Ref 3.3). The Grimsby to Walpole Project is being developed by NGET to reinforce the electricity transmission system to help deliver the UK Government's Net Zero targets. It forms part of a major programme of reinforcement of the electricity transmission system to accommodate substantial increases in north-south power flows. It would establish a new (wholly or largely overhead line) 400 kV transmission connection between five proposed new substations (one at Grimsby West, two Lincolnshire Connection substations, one at Weston Marsh and one at Walpole). The SOR confirms that although the proposed new Walpole substation is currently included as part of the Grimsby to Walpole Project, it also forms a common connection point for both the EGL 3 Project and the EGL 4 Project and the need for this new substation exists as a part of either EGL 3 and EGL 4 or the Grimsby to Walpole Project and therefore will form part of their respective DCOs.

Figure 3.2: EGL OPP6 new Walpole Substation potential strategic option

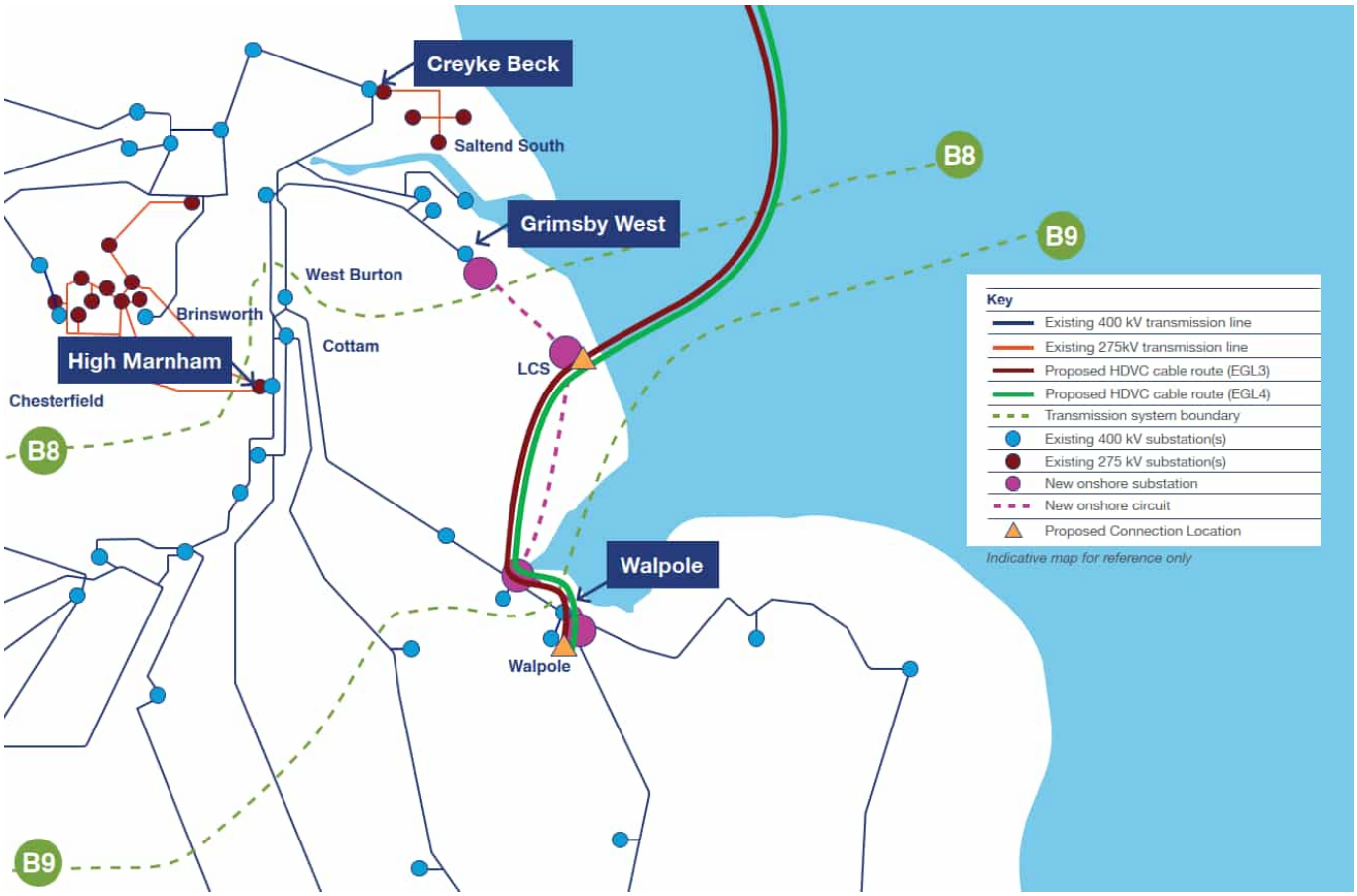


3.4.5 One of the options, described as EGL OPP7 (shown below in **Figure 3.3: EGL OPP7 new Walpole substation with three ended HVDC link potential strategic**) within the SOR, identified the potential for one of the HVDC Links (i.e. either EGL 3 or EGL 4) forming a three-ended connection by connecting to the LCS (proposed by the Grimsby to Walpole Project) first, before continuing to a proposed new Walpole substation.

3.4.6 The SOR noted that the option of making one of either EGL 3 or EGL 4 a three-ended connection in England would increase capacity from the LCS in the future without the need for additional circuits in the near term, subject to the successful delivery of the Grimsby to Walpole Project. It stated that to construct this three-ended connection additional infrastructure, comprising a switching station and a converter station, would be required in the vicinity of one of the LCS located southwest of Mablethorpe in East Lindsey.

3.4.7 The SOR noted that there was not a current requirement for this three-ended connection in England, to meet the need case for EGL 3 and EGL 4. However, NGET considered that the option (EGL OPP6) developed for EGL 3 and EGL 4 would have the ability to be changed to provide a three-ended connection to the LCS in England, in the future should additional capacity be required.

Figure 3.3: EGL OPP7 new Walpole substation with three ended HVDC link potential strategic



3.5 Options Identification and Selection

3.5.1 Following confirmation of the Strategic Proposal, a Corridor and Preliminary Routeing and Siting Study ('the CPRSS') was undertaken as part of Options Identification and Selection to further define the location of the proposed Project infrastructure (see Chapters 5 – 11 of the CPRSS) within a defined study area[1].

3.5.2 The focus of the CPRSS was on the routeing of new underground cables and siting of the new landfall, converter stations, substation and switching station infrastructure in the study area. The focus of the CPRSS was to appraise the options for proposed new infrastructure but not for works proposed at existing elements of the electricity infrastructure network which also form part of the overall English Onshore Scheme. The options and identification and selection process for the English Offshore Scheme is detailed in **Volume 1, Part 3 English Offshore Scheme, Chapter 19: Consideration of Alternatives.**

1 An area within which a range of potential corridor options, station siting zones or areas for the new infrastructure will be considered.

3.5.3 A staged approach, undertaken in line with NGET's Approach to Consenting[2], comprised:

- Step 1: Defining the study areas – this step sought to identify the broad areas within which transmission infrastructure required for the Project will be located.
- Step 2: Scope of Environmental Topics and Data Gathering – data was obtained to understand the presence, and distribution of, environmental, socio-economic, and technical constraints and opportunities within the study areas. Buffers were also included for some features representing constraints, where it was considered that potentially significant indirect impacts could occur from beyond the asset itself.
- Step 3: Ascribe a weight to confirm and 'Heat Map' Features - features identified in Step 2 were assigned a classification or "sensitivity weighting" based on their sensitivity to the technology likely to be required for the Project. Sensitivity weightings associated with these features were reviewed and were then combined to produce separate composite 'heat maps'.
- Steps 4 – 6: Identifying and Defining Siting Zones, Siting Areas and Corridors – starting with the heat maps produced in Step 3; corridors, siting areas and siting zones were then identified, defined, refined, and confirmed, informed by a combination of GIS analysis, professional judgement, knowledge of routeing and siting considerations, and site visits undertaken by both environmental and engineering specialists.
- Steps 7 - 8: Options Appraisal and Selection of Preferred Options - All options were appraised taking into account potential effects on the environment, the local community, relevant planning policy, including the National Policy Statements (NPS) for Energy (EN-1) and Electricity Network Infrastructure (EN-5), other existing and proposed development as well as technical and engineering design information to agree a preferred Landfall study area, corridor and siting zones.

Study Areas

3.5.4 The connection points (landfall, the new Walpole converter stations, new Walpole substation, the new LCS converter station and Direct Current Switching Station (DCSS)) were taken as a start point for the definition of the study areas for the onshore components for EGL 3 and EGL 4 i.e. the English Onshore Scheme. Given the large geographical extent of the English Onshore Scheme, four distinct but interrelated study areas were defined within the CPRSS. These study areas covered the Landfall study areas, the new underground cables, the new converter stations and substation (in the vicinity of the existing Walpole substation in King's Lynn) and the new switching station and converter station (in the vicinity of the proposed LCS in East Lindsey). The approach to developing the separate study areas is detailed within the CPRSS; however, the approach was based on balancing:

2 NGET develops projects through a six-stage process set out in the Approach to Consenting (April 2022) guidance available at https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/planning-and-development. Accessed 14 February 2024.

- NGET's statutory duty to develop an efficient, co-ordinated and economical system of transmission (Section 9 of the Electricity Act (1989);
- NGET's statutory duty to preserve amenity under Section 38 and Schedule 9 of the Electricity Act 1989;
- Holford Rule[3] 1 (which is to "avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the first line in the first place, even if the total mileage is somewhat increased in consequence"); and
- Horlock Rule[4] 2 (which is to "as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections").

3.5.5 The separate study areas overlapped, and as such, the combined areas were referred to as 'the study area'. The study area can be considered in three parts and is shown on **Figure 3.4: Routeing and Siting Study Areas**:

- the northern extent – the northern extent of the study area is located primarily within the district of East Lindsey, with areas of the north and northwest within the districts of North East Lincolnshire. This part of the study area is located between the settlements of Grimsby and Skegness (Grimsby to the north and Skegness to the south) and is bounded by multiple villages such as North Cotes, Marshchapel, Wragholme and North Somercotes. The Lincolnshire Wolds also falls within the northern extent of the study area. The northern extent primarily comprises the low-lying coastal plain landscape of the Lincolnshire Coast and Marshes National Character Area (NCA) as well as the Lincolnshire Wolds NCA. The road network of the northern extent comprises the A16, A1031, A157, A1104, A1111, A52, and A158 connecting Grimsby, Louth, Skegness and Boston. The Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC, Greater Wash SPA; Inner Dowsing, Race Bank and North Ridge SAC, and Humber Estuary Ramsar, SAC and SPA are located along the Lincolnshire coastline to the east.
- the central extent – the central extent of the study area is bounded by the A158 in the north and the River Welland to the south, and is located between the settlements of Donnington, Heckington and Halton Holegate in the west and The Wash SPA and Ramsar, and The Wash and Norfolk Coast SAC to the east. This section is located primarily within the districts of East Lindsey and Boston, with areas to the south and west extending into South Holland and North Kesteven. The central extent primarily comprises the distinctive, historic, and human influenced wetland landscape of The Fens NCA. Existing electricity transmission and distribution infrastructure include two 132 kV substations (north of Croft and south of Boston) and the connecting 132 kV overhead lines. The road network of the central extent comprises the A52, A16, and A1121, connecting Skegness, Boston and Spilsby. Gibraltar Point Ramsar and SPA,

3 The Holford Rules are a series of guideline rules which provide a set of design criteria, accepted as industry best practice in overhead line routeing. The guidelines now form an important part of national planning policy relating to the development of electricity networks, as set out in National Policy Statement EN-5.

4 The Horlock Rules are a series of guideline rules for the siting and design of new substations, or substation extensions, converter stations and includes consideration of line entries and sealing end compounds (SECs). The rules provide a set of principles which avoid, or reduce the environmental impacts associated with the development of substation infrastructure.

and Inner Dowsing, Race Bank and North Ridge SAC also lie along the Lincolnshire coastline to the east.

- the southern extent – the southern extent of the study area is bounded by the River Welland and The Wash SPA and Ramsar, and The Wash and Norfolk Coast SAC in the north and Walpole to the south. It is located between Spalding in the west and the villages of Walpole Cross Keys to the east and the town of Wisbech to the south. This section is located within the district of South Holland, with areas to the southeast extending into Fenland and Terrington St John. The southern extent primarily comprises the distinctive, historic, and human influenced wetland landscape of The Fens NCA. Existing electricity transmission and distribution infrastructure include the existing 4ZM 400 kV overhead line connecting to the existing Bicker Fen 400 kV substation and continuing to meet the existing 400 kV 2WS overhead line northeast of Spalding. The road network of the southern extent comprises the A17, A151 and A1101 connecting Boston, Spalding and Wisbech.

Figure 3-4
Routeing and Siting Study Areas

Legend

- Boundary between Northern /Central/ Southern Study Areas
- Cable Study Area
- Walpole Study Area
- Theddlethorpe Landfall Study Area
- Horseshoe Point Landfall Study Area
- Anderby Creek Landfall Study Area
- LCS Converter Station Study Area

Notes

This drawing is scaled at paper size A3, therefore any prints taken at smaller sizes will affect accuracy of the measurement units and should not be scaled against.

Coordinate System: British National Grid
Sheet X Centroid Coordinate: 540430.3E Sheet Y Centroid Coordinate: 352397.58N

0 1.25 2.5 5 7.5 Kilometres

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1	27/06/2024	DRAFT	NM	BS	JB

Title

Figure 3-4
Routeing and Siting Study Areas

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Figure Number: Figure 3-4

Drawing Reference: EGL-WSP-CONS-XX-DR-G-024 P01

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Landfalls Options Appraisal

3.5.6 The landfall study areas defined the area within which the offshore (submarine) cables come ashore (for details on the offshore cable routes, refer to **Volume 1, Part 3, English Offshore Scheme, Chapter 19: Consideration of Alternatives** of this Scoping Report). It is the interface between the onshore (terrestrial) and offshore (marine) components of the Projects. The landfall study area is considered to extend from MLWS (where it overlaps with the offshore components of EGL 3 and EGL 4) across the intertidal zone to terminate at a Transition Joint Bay (TJB). Three landfall study areas were defined and can be viewed within the CPRSS:

- **Horseshoe Point**: This landfall study area is in a rural setting northeast of the village Marsh Chapel, Grimsby and could be accessed via Sheep Marsh Lane off the A1031. The most prominent coastline features are the tidal flood defence dunes running northwest to southeast, the drainage channels parallel to the west of the dunes with agricultural land beyond, and the saltmarsh and mudflats to the east (towards the North Sea).
- **Theddlethorpe**: This landfall study area is located approximately 4.5 km north of the town of Mablethorpe on the Lincolnshire coastline. The potential landfall location could be accessed via Crook Bank Road, directly off the A1031. The landfall study area has a rural setting, with the former Theddlethorpe Gas Terminal immediately to the south and west and agricultural land to the west. The most prominent coastline features are the tidal flood defence sand dunes running north to south along the coastline.
- **Anderby Creek**: Anderby Creek is a small holiday village in Lincolnshire, to the north of Skegness. Within the Anderby Creek landfall study area, the potential landfall location could be situated to the north or south of Anderby Creek and accessed via Roman Bank Road. This landfall study area has a mainly rural setting with the most prominent coastline feature being a beach with tidal flood defence/sand dunes running north to south and with agriculture land to the west.

3.5.7 From an engineering and environmental perspective, the Horseshoe Point landfall study area was identified as the least preferred within the CPRSS. Regardless of which method of cable installation is employed at the landfall, it is likely that there would be some disturbance to the statutory ecological designations and priority habitat of saltmarsh and mudflats. A shorter trenchless cable installation method would still require sections of open cut in the intertidal area, with the potential to damage or disturb important habitats. A completely trenchless cable installation method would materially reduce such disturbance; however, the length of trenchless cable installation required to facilitate this may not be technically feasible and would still require access to the saltmarsh and mudflat priority habitats for geotechnical investigations and would increase the potential for frac-out[5] events.

5 'frac-out' is the unintentional return or inadvertent loss of drilling fluids from the borehole to the ground surface from points other than its entry and exit points, during a drilling operation.

3.5.8 As identified in the Marine Route Options Appraisals[6, 7], the presence of the Hornsea 1 and 2 Offshore Wind Farm (OWF) export cables, which also make landfall to the north of the Horseshoe Point landfall would make the immediate nearshore extremely constrained with regards to available physical space. In addition, due to the presence of the Hornsea 1 and 2 offshore wind farm export cables the landfall would have a likely significant effect on saltmarsh habitat. To approach the landfall, the offshore cable route alignment would need to cross the Humber Approaches Channel (the main shipping channel into the Humber Estuary and Ports of Grimsby, Immingham, Hull and Goole), and interact with the associated Traffic Separation Scheme (TSS). Therefore, this option has potential to impact on navigational safety, access to significant operational port facilities and the need to safeguard navigation depth. The water depth surrounding the navigation channels is very shallow (<10 m) for the first 5 km of the marine DC cable route alignment offshore, which could require the use of an anchored barge for DC cable installation, increasing the potential for disruption to shipping. The Donna Nook firing range, seal haul out site (for colonies in high numbers) and a pilot project for the re-introduction of seagrass and oysters (identified through consultation with stakeholders) were also a consideration. Offshore the marine DC cable route alignments would also need to cross the Holderness Offshore Marine Conservation Zone and the nearshore approach would also lie within the Humber Estuary SAC and SPA, the Greater Wash SPA, and the Humber Estuary SSSI. For further details on the offshore routeing options appraisals, see **Volume 1, Part 3 English Offshore Scheme, Chapter 19: Consideration of Alternatives** of this Scoping Report.

3.5.9 Therefore, Horseshoe Point was identified as least preferred and as such, onward onshore underground cable routeing from Horseshoe Point was not considered within the CPRSS.

3.5.10 Of the remaining landfall study areas, a preference was identified for the Anderby Creek landfall when compared to a landfall at Theddlethorpe. From an environmental and engineering perspective, the Anderby Creek landfall has comparatively fewer statutory ecological designations, and is likely to be more feasible in terms of the length of trenchless cable that would need to be installed to avoid direct disturbance to the statutory ecological designations, as well as the Environment Agency tidal flood defences (which are present at both landfall study areas). However, it was acknowledged within the CPRSS that due to the multiple existing and proposed landfalls at Anderby Creek (e.g. Outer Dowsing Offshore Wind Farm), a proposed landfall in this area has the potential for cumulative effects upon the ecological environment and communities.

3.5.11 Recognising that the preferential balance may alter as a result of further environmental and engineering studies; it was decided that both landfall options would be taken forward as emerging preferences to allow sufficient flexibility for the design to evolve. For example, although Anderby Creek is marginally preferred, should further engineering studies identify a suitable design solution at Theddlethorpe i.e. one which

6 Eastern Green Link 3 (EGL 3) Marine Route Options Appraisal (NGET and SSEN Transmission, September 2023).
7 Eastern Green Link 4 (EGL 4) Marine Route Options Appraisal (NGET and SPEN, September 2023).

mitigates the potential impacts upon the statutory designated ecological sites and tidal flood defences, this may drive a preference towards Theddlethorpe.

Route Corridor Options Appraisal

3.5.12 Within the underground cable study area, a corridor identification exercise was undertaken to identify a network of potential corridors within which the underground onshore HVDC cables would route. To allow for clear, comparative analysis, these were structured and named. Due to the sheer extent of the underground cable study area, and to facilitate a clear comparative analysis, the Corridors were appraised within separate chapters in the CPRSS according to their geographical location i.e. Corridors which are located between the landfalls and the River Welland, and Corridors located between the River Welland and Walpole. Drawings of these Corridors can be viewed within the CPRSS.

Landfalls to the River Welland

3.5.13 Twenty-six Corridors between the Theddlethorpe and Anderby Creek landfall study areas and the River Welland were identified (see **Figure 3-5 to 3-8**) and are described below:

- Corridor 1: This Corridor begins at the connection with the Theddlethorpe landfall, east and south of Theddlethorpe St Helens, and routes southwest towards Maltby le Marsh. It splits into two legs to avoid Maltby le Marsh, one west and north of Maltby le Marsh and one east and south of Maltby le Marsh. Underground cable routes within this Corridor would be approximately 9.6 km in length.
- Corridor 2: This Corridor starts east of Maltby le Marsh and routes southeast to finish east of Hannah. Underground cable routes within this Corridor would be approximately 4.4 km in length.
- Corridor 3: This Corridor begins west and south of Maltby le Marsh. It routes southeast and is split to avoid the settlements of Beesby, Saleby, Thoresthorpe and Asserby. Underground cable routes within this Corridor would be approximately 4.1 km in length.
- Corridor 4: This Corridor begins east of Hannah and routes southwest to the southwest of Asserby and to the north of Huttoft. Underground cable routes within this Corridor would be approximately 3.5 km in length.
- Corridor 5: This Corridor begins at the connection with the Anderby Creek landfall. It then splits into two legs – one routes west and connects to Corridor 4 to the north of Huttoft and the other follows the coast southwards to the north of Anderby before routeing west and towards Huttoft. Underground cable routes within this Corridor would be approximately 2.9 km in length.
- Corridor 6: This Corridor begins to the north of Thurlby and routes to the southeast of Thurlby. Underground cable routes within this Corridor would be approximately 1.8 km in length.
- Corridor 7: This Corridor starts west of Mumby and continues south, crossing the A158 and finishes southeast of Burgh le Marsh. Underground cable routes within this Corridor would be approximately 13.2 km in length.

- Corridor 8: This Corridor starts east of Willoughby, and passes near to the villages of Sloothby, Hasthorpe and Habertoft. It then routes west, crossing the A158 to the north and northwest of Gunby Park, before it continues south finishing at Thorpe Bank. Underground cable routes within this Corridor would be approximately 18.0 km in length.
- Corridor 35: This Corridor begins west of Maltby le Marsh, and routes southeast past Ulceby and Skendleby Psalter, before finishing north of Gunby Park. Underground cable routes within this Corridor would be approximately 13.6 km in length.
- Corridor 36: This Corridor begins west of Maltby le Marsh and continues south. It continues south at Ulceby, and passes east of Dalby, before finishing northeast of Little Steeping. Underground cable routes within this Corridor would be approximately 17.6 km in length.
- Corridor 37: This Corridor begins west of Maltby le Marsh, and continues south, passing north and south of Sutterby and east and west of Mavis Enderby, before crossing the A155. It then continues east, past (east and west of) New Bolingbroke and Carrington before finishing north of Boston. Underground cable routes within this Corridor would be approximately 34.8 km in length.
- Corridor 9: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and routes southwest, between the A52 and the coast. It crosses The Haven river and ends at Wyberton Roads. Underground cable routes within this Corridor would be approximately 32.5 km in length.
- Corridor 10: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane, routes southwest and splits into three legs. The three legs then merge to the west of Wainfleet Bank and the Corridor proceeds to route south, crossing the A52 and ending southeast of Wrangle. Underground cable routes within this Corridor would be approximately 32.2 km in length.
- Corridor 11: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and routes southwest, splitting into two legs between Firsby and Wainfleet All Saints. The two Corridor legs combine and the Corridor routes to east of Stickney before routeing south. The Corridor continues south of Butterwick before routeing southwest and finishing at Wyberton Roads. Underground cable routes within this Corridor would be approximately 36.5 km in length.
- Corridor 12: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and routes southwest, splitting into several Corridor legs northwest of Boston. This Corridor finishes west of Kirton End at Donington Road. Underground cable routes within this Corridor would be approximately 40.3 km in length.
- Corridor 13: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and routes west towards Stickney. It then routes south to Silsby and then southwest, where it finishes at Donington Road. Underground cable routes within this Corridor would be approximately 41.0 km in length.
- Corridor 14: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and routes southwest to Stickney before continuing south, where the Corridor then routes southwest at Butterwick and ends at Wyberton Roads. Underground cable routes within this Corridor would be approximately 38.0 km in length.

- Corridor 15: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and routes southwest, between Stickney and Sibsey. The Corridor then routes south, passing the west of Boston before finishing at Donington Road. Underground cable routes within this Corridor would be approximately 38.9 km in length.
- Corridor 16: This Corridor starts southwest of Firsby, at Thorpe Bank road. It then routes southwest to Stickney, and from here continues southwest past Boston and finishes at Donington Road. Underground cable routes within this Corridor would be approximately 30.3 km in length.
- Corridor 17: This Corridor begins southwest of Firsby, at Thorpe Bank road. The Corridor then routes southwest towards Stickney before heading south to the east of Sibsey. The Corridor then routes southwest again at Frith Bank and finally routes south to finish at Donington Road. Underground cable routes within this Corridor would be approximately 40.0 km in length.
- Corridor 18: This Corridor begins southwest of Firsby, at Thorpe Bank road. The Corridor then routes southwest towards Stickney before heading south to the east of Sibsey. However, at Sibsey, the Corridor routes south to Butterwick and then routes southwest and finishes at Wyberton Road, southeast of Boston. Underground cable routes within this Corridor would be approximately 28.0 km in length.
- Corridor 19: This Corridor starts southeast of Burgh le Marsh, at Billgate Lane and splits into three separate legs as it routes southwest towards Stickney. The Corridor then routes south before turning southwest at Sibsey and finishes at Donington Road. Underground cable routes within this Corridor would be approximately 39.4 km in length.
- Corridor 20: The Corridor starts at the B1391, west of Kirton End. The Corridor initially routes southwest to the A17. From here it turns and follows the southern edge of A17 to the southeast. The Corridor then continues southeast where it crosses the A16 and River Welland before terminating to the southwest of Fosdyke Bridge. Underground cable routes within this Corridor would be approximately 12.9 km in length.
- Corridor 21: This Corridor starts at the B1391, west of Kirton End. The Corridor routes southeast, crossing the A16 to avoid the settlements of Sutterton and Algarkirk. The Corridor then routes south and crosses the A17 heading south before terminating southwest of Fosdyke bridge. Underground cable routes within this Corridor would be approximately 9.7 km in length.
- Corridor 22: This Corridor starts at the B1391, west of Kirton End. This Corridor routes southwest before turning to follow the A17 southeast. The Corridor narrows as it follows the A17 directly through Sutterton Roundabout until east of Marsh Lane where the Corridor takes a sharp turn to the south and widens. The Corridor then terminates at Moulton Marsh. Underground cable routes within this Corridor would be approximately 13.4 km.
- Corridor 23: The Corridor starts southeast of Wyberton at Wyberton Roads. The Corridor routes southwest from this point, passing the settlements of Frampton, Kirton, Sutterton and Algarkirk to the southeast. The Corridor then splits into two arms to pass around Fosdyke and Fosdyke Bridge, the arms crossing the A17 to the east and west of these settlements respectively. The arms then cross the River

Welland to the south of Fosdyke Bridge, before terminating at Moulton Marsh. Underground cable routes within this Corridor would be approximately 10.8 km.

Figure 3-5
Corridors between the Theddlethorpe and Anderby Creek Landfall Study Areas and the River Welland

Legend

- Scoping Boundary

EGL 3 and EGL 4 Preliminary Corridors

- Corridor 1
- Corridor 2
- Corridor 3
- Corridor 4
- Corridor 5
- Corridor 6
- Corridor 7
- Corridor 8
- Corridor 9
- Corridor 10
- Corridor 11
- Corridor 12
- Corridor 13
- Corridor 14
- Corridor 15
- Corridor 16
- Corridor 17
- Corridor 18
- Corridor 19
- Corridor 20
- Corridor 21
- Corridor 22
- Corridor 23
- Corridor 35
- Corridor 36
- Corridor 37

Notes
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0 0.5 1 2 3 4 Kilometres

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Title

Figure 3-5
Corridors between the Theddlethorpe and Anderby Creek Landfall Study Areas and the River Welland

nationalgrid

Figure Number
Figure 3-5

Drawing Reference
EGL-WSP-CONS-XX_DR-G-014 P01

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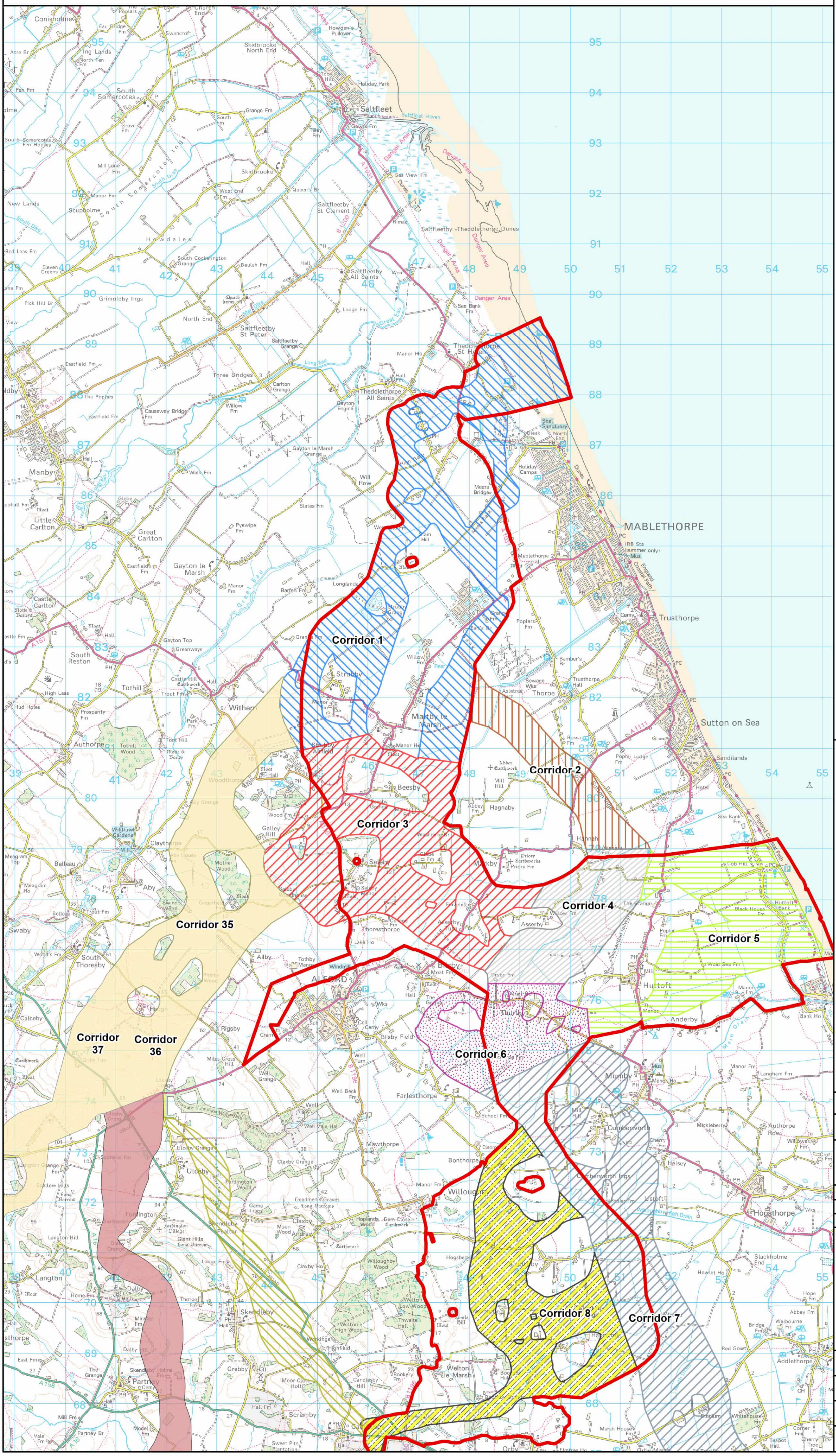
Figure 3-6
Corridors between the Theddlethorpe and Anderby Creek Landfall study areas and Welton le Marsh



Legend

- Scoping Boundary

EGL 3 and EGL 4 Preliminary Corridors

- Corridor 1
- Corridor 2
- Corridor 3
- Corridor 4
- Corridor 5
- Corridor 6
- Corridor 7
- Corridor 8
- Corridor 35
- Corridor 36
- Corridor 37

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Kilometres

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Title

Figure 3-6
Corridors between the Theddlethorpe and Anderby Creek Landfall study areas and Welton le Marsh

nationalgrid

Figure Number	Drawing Reference		
Figure 3-6	EGL-WSP-CONS-XX_DR-G-015 P01		
Scale	**Sheet Size**	**Sheet**	**Issue**
1:75,000	A3	SHEET 1 OF 1	1

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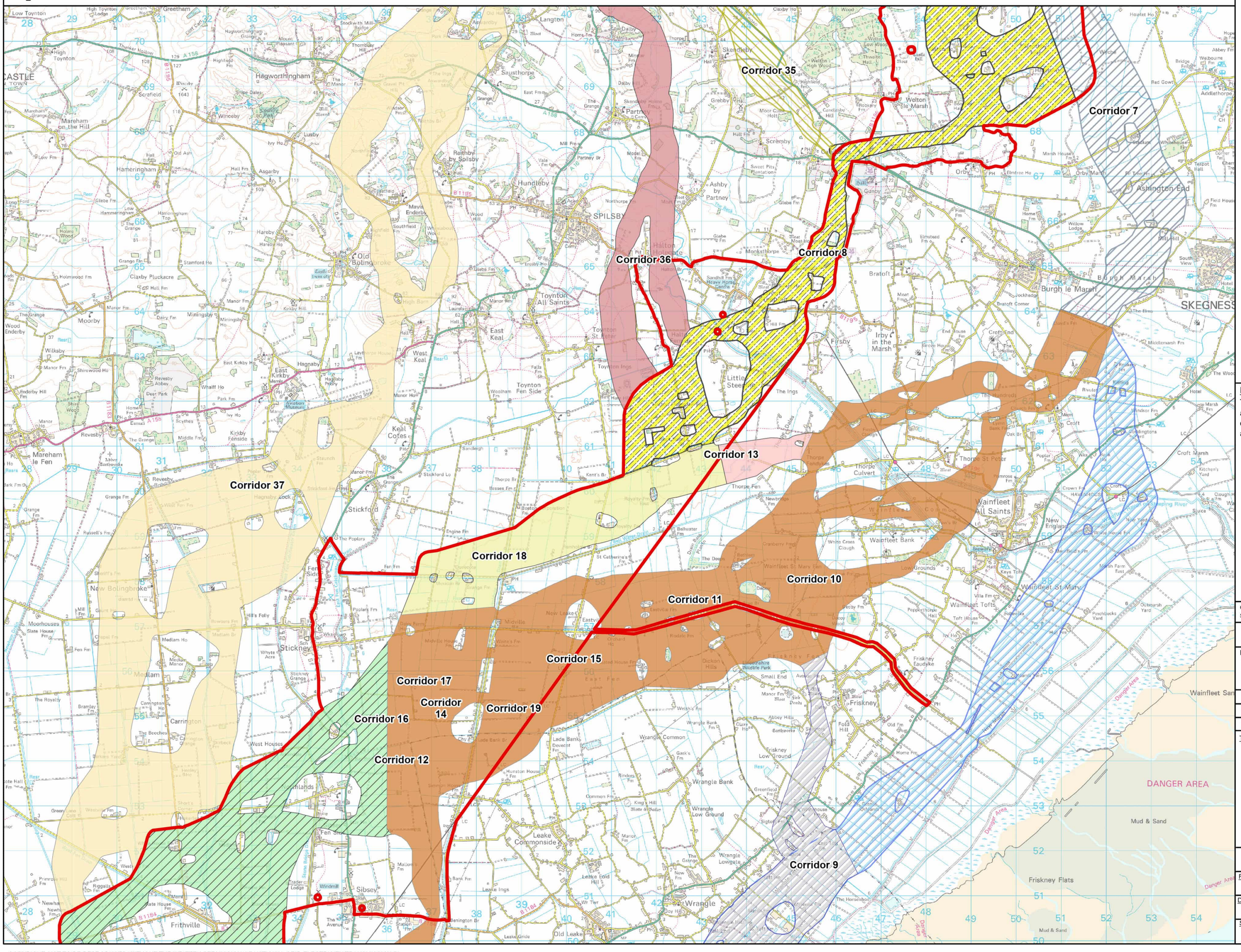
Figure 3-7
Corridors between Welton le Marsh and Frithville



Legend

Scoping Boundary

EGL 3 and EGL 4 Preliminary Corridors

- Corridor 1
- Corridor 2
- Corridor 3
- Corridor 4
- Corridor 5
- Corridor 6
- Corridor 7
- Corridor 8
- Corridor 9
- Corridor 10
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- Corridor 17
- Corridor 18
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- Corridor 21
- Corridor 22
- Corridor 23
- Corridor 35
- Corridor 36
- Corridor 37

Notes

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Title

Figure 3-7
Corridors between Welton le Marsh and Frithville

nationalgrid

Figure Number: Figure 3-7

Drawing Reference: EGL-WSP-CONS-XX_DR-G-016 P01

Scale	Sheet Size	Sheet	Issue
1:80,000	A3	SHEET 1 OF 1	1

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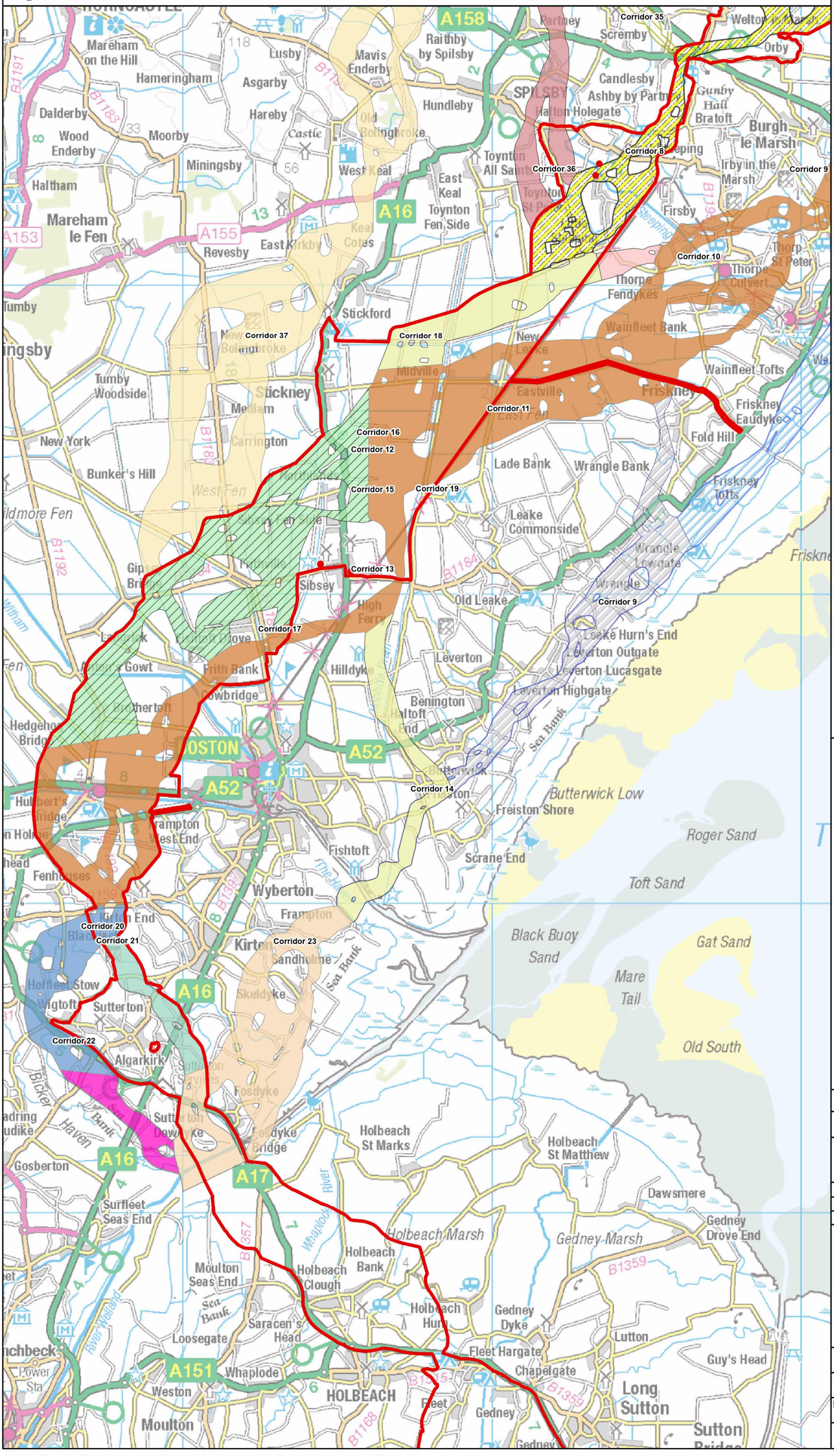
Figure 3-8
Corridors between Frithville and the River Welland



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Title

Figure 3-8
Corridors between Frithville and the River Welland

nationalgrid

Figure Number	Drawing Reference	Scale	Sheet Size	Sheet	Issue
Figure 3-8	EGL-WSP-CONS-XX_DR-G-017 P01	1:122,000	A3	SHEET 1 OF 1	1

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3.5.14 Following a comparative review of the Corridors, those Corridors routeing south and east of Boston were identified as least preferred within the CPRSS (Corridors 9, 10, 11, 14 and 18 which all connect into Corridor 23). This was primarily due to the limited routeing flexibility, technical complexity and the potential for effects upon the ecological and water environment to the east and west of The Haven. The following constraints and features are present within or close to this comparatively narrow part of the Corridor:

- the presence of the Outer Dowsing OWF underground cables;
- the need to cross The Haven (a statutory main river) and Hobhole Drain (a statutory main river), and route through the Havenside Nature Reserve and Country Park;
- the presence of a cluster of properties at Fishtoft; and
- the proximity of The Wash, which comprises multiple national, European and international designated sites.

3.5.15 Corridors 35, 36, and 37 were also not preferred as they require extensive routeing within the Lincolnshire Wolds, increasing the likelihood of substantive albeit temporary adverse impacts on the character of the Lincolnshire Wolds, and on receptors within the Lincolnshire Wolds. These Corridors would also cross a comparatively steeper terrain, through the Lincolnshire Wolds, which would challenge cable installation, and access for installation, potentially necessitating the use of specialist vehicles, plant and equipment for construction and installation. This may include significant earthworks to reduce gradients and provide a safe working environment. Furthermore, the Viking Link Interconnector already routes through the Lincolnshire Wolds and intersects with these Corridors; thus, it is likely that the route of the Viking Link Interconnector has already utilised the most suitable terrain for its cable route within the Lincolnshire Wolds.

3.5.16 Regarding the Corridors that connect to the landfalls, if a landfall at Anderby Creek is taken forward then there is a preference for routeing to potential locations for the LCS converter station via Corridors 3, 4 and 5. If a landfall at Theddlethorpe is taken forward then there is a preference for routeing via Corridors 1 and 3, to potential locations for the LCS converter station. These Corridor preferences (from each landfall) are in part due to the shorter distance for onshore routeing from the Anderby Creek and Theddlethorpe landfall to LCS converter station sites which therefore have the potential to result in fewer adverse environmental effects (i.e., by adopting a shorter route, there is a reduced likelihood of encountering sensitive environmental features) and reduced engineering complexity. Use of Corridor 2 is less preferred because routeing through the Corridor from either landfall would not represent the shortest, most direct route to potential locations for the LCS converter station.

3.5.17 When considering the Corridors that lie between the LCS converter station sites and the A158, the two remaining are Corridors 7 and 8. The primary differentiator between these Corridors is the presence of the proposed Grimsby to Walpole Project and Outer Dowsing OWF Project, both of which route through and overlap with Corridor 7 between Burgh le Marsh and Skegness. This, in addition to the narrow areas along Younger's Lane and Marsh Lane (because of linear settlement and clusters of properties) and the presence of the existing Triton Knoll OWF underground cables, considerably limits routeing flexibility within Corridor 7, and poses technical complexities associated with routeing near both proposed projects.

3.5.18 Overall Corridor 8 is preferred over Corridor 7 because, although it routes through a short section of the Lincolnshire Wolds (for approximately 700 m), it is a comparatively shorter route overall, and is at a greater distance from ecologically designated sites (specifically from Bratoft Meadows SSSI and the National Site Network (NSN) along the Lincolnshire coastline), with fewer potential physical interactions with the Grimsby to Walpole Project and Outer Dowsing OWF Projects. Additionally, Corridor 8 also has a lower potential for interaction with Flood Zones 2 and 3, and avoids the heavily constrained and technically complex area for cable routeing, north of the A158.

3.5.19 Of the remaining Corridors between the A158 and Kirton End (Corridors 12, 13, 15, 16, 17, and 19), those which connect to Corridor 7 (i.e. Corridors 12, 13, 15 and 19) are less preferred as they would not assist in providing an end-to-end solution between the landfalls and the River Welland. Corridor 16 is likely to require more watercourse crossings than Corridor 17, but Corridor 17 is comparatively more constrained, where it routes through narrower areas, as at Sibsey. Corridor 17 would also require two additional crossings of the Poacher railway line.

3.5.20 Between Kirton End and the River Welland, all Corridors would route near to the proposed Grimsby to Walpole Project. However, Corridors 20 and 22 are less preferred than Corridor 21 primarily as they follow a less direct and therefore longer route south towards the River Welland. Corridor 20 may also require routeing parallel to an existing gas main which would further increase technical complexity and limit routeing flexibility.

3.5.21 Overall, considering the requirement to consider potential Corridors from both the Theddlethorpe and Anderby Creek landfalls, the following Corridors are preferred between the Landfall study areas and the River Welland:

- From Theddlethorpe: Corridors 1, 3, 4, 6, 7, 8, 16, and 21.
- From Anderby Creek: Corridors 3, 4, 5, 6, 7, 8, 16, and 21.

River Welland to Walpole

3.5.22 Eleven Corridors between the River Welland to Walpole were identified (see **Figure 3.9a** and **Figure 3.9b**) and are described below:

- Corridor 24: This Corridor initially routes south from the River Welland, before curving round the west edge of the settlement of Weston, crossing the A151 as it does so. The Corridor then proceeds southeast across predominantly fenland and towards Wisbech, before turning south and crossing the A17 south of Wisbech St Mary. The Corridor then routes east before terminating at the border between Cambridgeshire and Norfolk, east of Friday Bridge. Underground cable routes within this Corridor would be approximately 43.7 km in length.
- Corridor 25: This Corridor initially routes south from the River Welland, before curving round the west edge of the settlement of Weston, crossing the A151 as it does so. The Corridor diverges east soon after it crosses the Lincolnshire and Cambridgeshire border, before terminating to the north of West Walton. Underground cable routes within this Corridor would be approximately between 31.8 km and 36.5 km in length, subject to siting decisions for the Walpole converter stations and substation.
- Corridor 26: This Corridor initially routes south from the River Welland, before curving round the western edge of the settlement of Weston, crossing the A151 as it

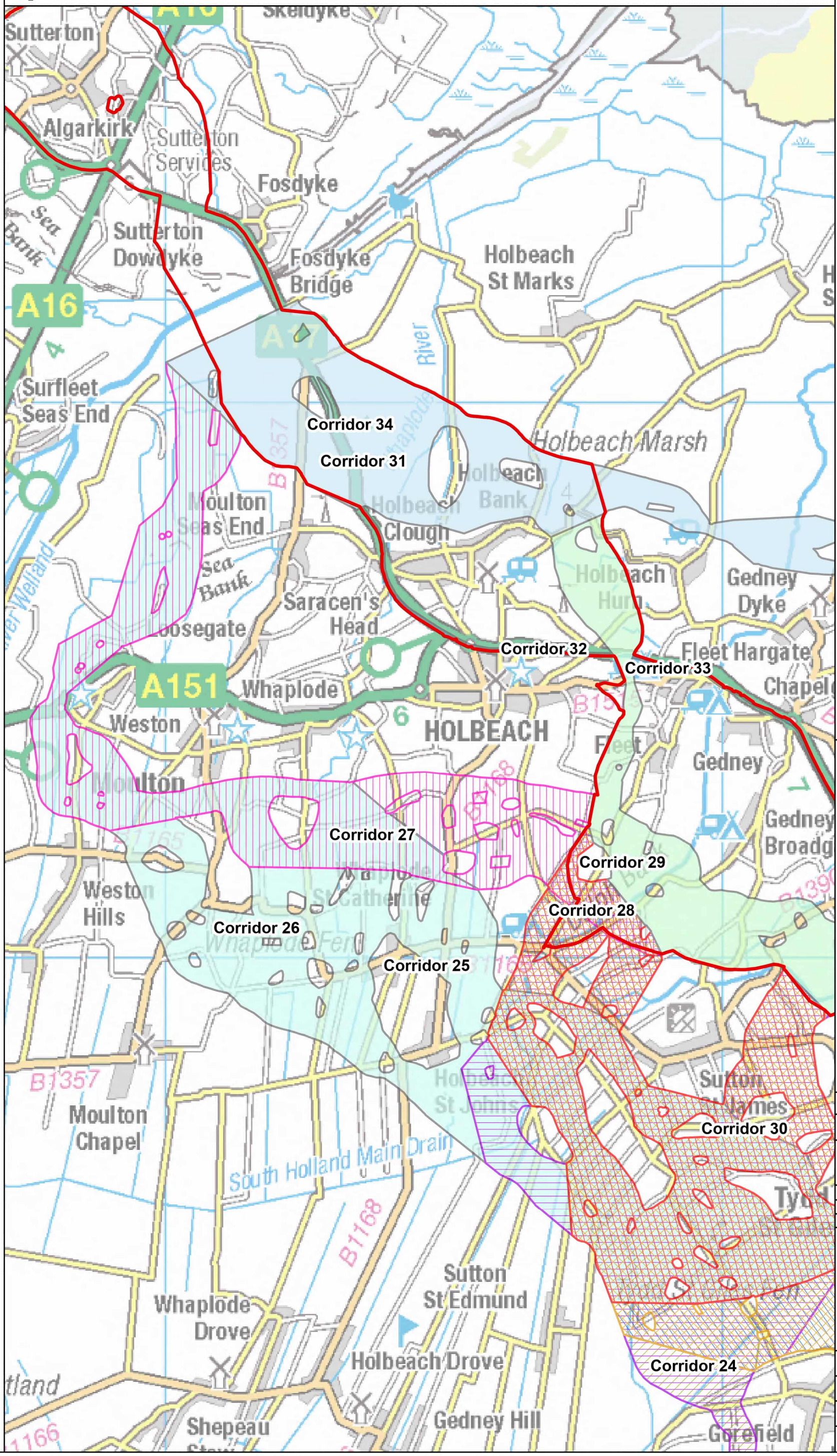
does so. The Corridor diverges east soon after it crosses the Lincolnshire and Cambridgeshire border and terminates close to the settlement of Tydd St Giles. Underground cable routes within this Corridor would be approximately between 29.8 km and 35.2 km subject to siting decisions for the Walpole converter stations and substation.

- Corridor 27: This Corridor initially routes south from the River Welland, before curving round the western edge of the settlement of Weston, crossing the A151 as it does so. The Corridor then diverges east to take a northerly route through the fenland; north of Sutton St James and Tydd St Mary. The Corridor crosses into Norfolk, from Lincolnshire, before terminating at the same point as Corridor 26. Underground cable routes within this Corridor would be approximately between 33.7 km and 36.1 km in length, subject to siting decisions for the Walpole converter stations and substation.
- Corridor 28: This Corridor initially routes southeast from the River Welland, and curving around the east of Holbeach, crossing the A17 as it does so. The Corridor then routes south, widening out as it crosses the fenland, and splitting into two arms to bypass Sutton St James. The Corridor then overlaps with Corridor 25 as it crosses the Lincolnshire and Cambridgeshire border, before following the same route as Corridor 24 to its end point east of Friday Bridge. Underground cable routes within this Corridor would be approximately 42.4 km in length.
- Corridor 29: This Corridor initially routes southeast from the River Welland, and curving around the east of Holbeach, crossing the A17 as it does so. The Corridor then routes south, widening out as it crosses the fenland until south of Sutton St James, where the Corridor diverges east and overlaps with Corridor 25 to its end point north of West Walton. Underground cable routes within this Corridor would be between approximately 29.1 km and 33.6 km in length, subject to siting decisions for the Walpole converter stations and substation.
- Corridor 30: This Corridor initially routes southeast from the River Welland, and curving around the east of Holbeach, crossing the A17 as it does so. At a point south of Tydd St Giles it diverges east, following Corridor 26 to its end point north of West Walton. Underground cable routes within this Corridor would be approximately between 25.1 km and 30.5 km in length, subject to siting decisions for the Walpole converter stations and substation.
- Corridor 31: This Corridor initially routes southeast from the River Welland, and curving around the east of Holbeach, crossing the A17 as it does so. The Corridor then routes south, widening out as it crosses the fenland until north of Sutton St James, where the Corridor diverges east, following the same route as Corridor 27 to the north of Tydd St Mary, to its terminus north of West Walton. Underground cable routes within this Corridor would be approximately between 27.4 km and 29.3 km in length, subject to siting decisions for the Walpole converter stations and substation.
- Corridor 32: This Corridor allows alternative routes to Corridors 28 to 31 (and Corridor 34 if Corridor 33 is also used). It follows the A17 from north of Saracen's Head to the terminus east of Holbeach. Underground cable routes within this Corridor would be approximately 6.4 km in length.
- Corridor 33: This Corridor begins at the terminus of Corridor 32. It allows alternative routes to Corridors 28 to 31 (to connect to Corridor 34). The Corridor follows the A17

to its end point to the west of Sutton Bridge (at Corridor 24). Underground cable routes within this Corridor would be approximately 9.3 km in length.

- Corridor 34: This Corridor initially routes east towards The Wash from the River Welland, passing to the north of Lutton, before turning south, passing to the east of Long Sutton, crossing the A17 and adjoining Corridor 31 to the east of Tydd St Mary. Underground cable routes within this Corridor would be approximately between 28.4 km and 29.9 km in length.

Figure 3-9a
Corridors between the River Welland and Walpole (Page 1)



Legend

Scoping Boundary

EGL 3 and EGL 4 Preliminary Corridors

- Corridor 24
- Corridor 25
- Corridor 26
- Corridor 27
- Corridor 28
- Corridor 29
- Corridor 30
- Corridor 31
- Corridor 32
- Corridor 33
- Corridor 34

Notes
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Title

Figure 3-9a
Corridors between the River Welland and Walpole (Page 1)

nationalgrid

Figure Number
Figure 3-09a

Drawing Reference
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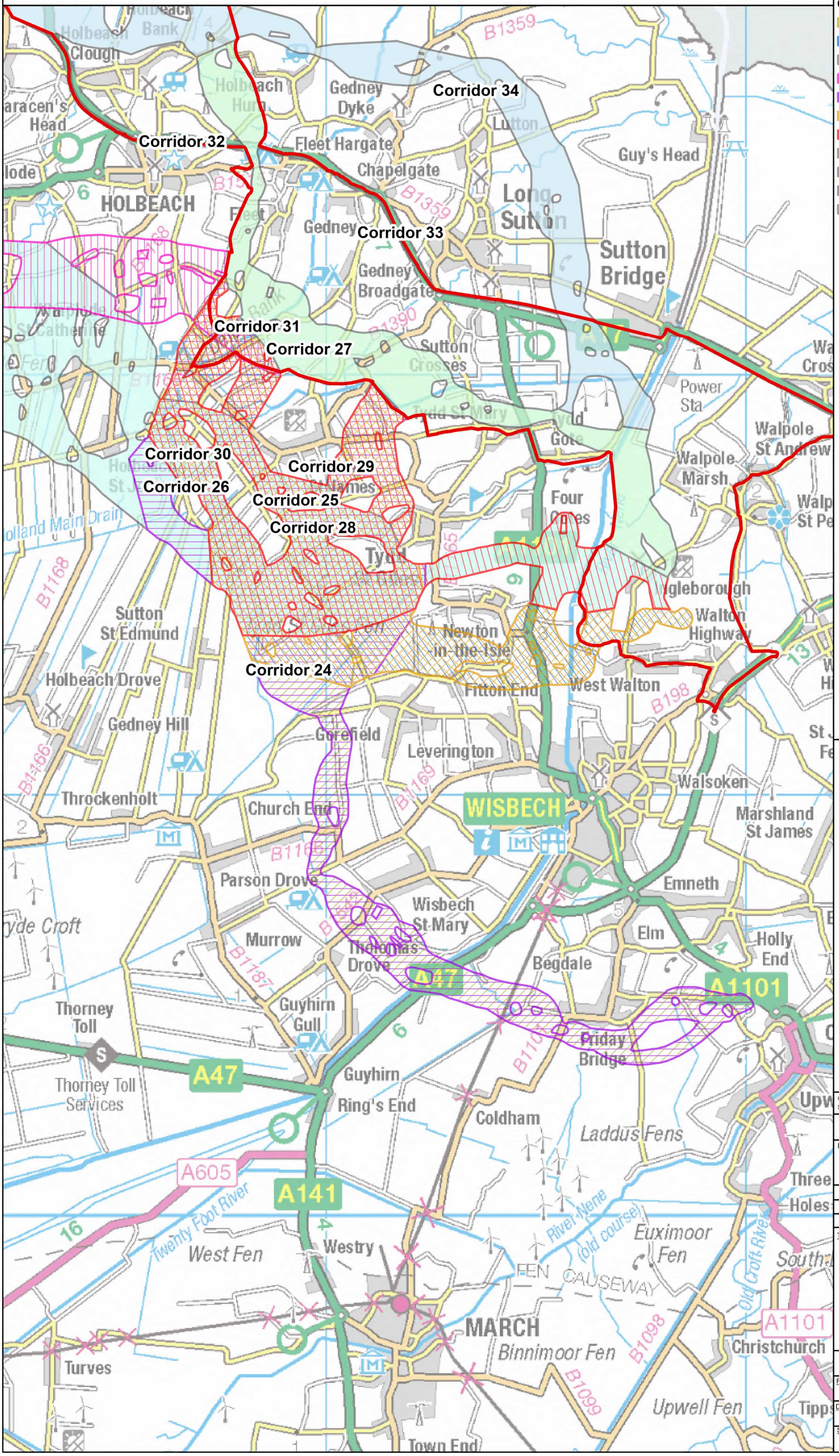
Figure 3-9b
Corridors between the River Welland and Walpole (Page 2)



Legend

- Scoping Boundary

EGL 3 and EGL 4 Preliminary Corridors

- Corridor 24
- Corridor 25
- Corridor 26
- Corridor 27
- Corridor 28
- Corridor 29
- Corridor 30
- Corridor 31
- Corridor 32
- Corridor 33
- Corridor 34

Notes

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1	19/04/2024	DRAFT	EP	BS	JB

Title

Figure 3-9b
Corridors between the River Welland and Walpole (Page 2)

nationalgrid

Figure Number
Figure 3-09b

Drawing Reference
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Scale	Sheet Size	Sheet	Issue
1:90,000	A3	SHEET 2 OF 2	1

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3.5.23 Following comparative review of the Corridors, use of Corridors 24 and 28 were identified as less preferred within the CPRSS. This was primarily due to the extended length of Corridors 24 and 28 (approximately 10 km longer than the next longest Corridor) which would increase the potential environmental impacts, especially those on the landscape and heritage receptors southwest of Wisbech. Furthermore, this increased length would further increase the amount of permanent and temporary infrastructure required for construction, alongside increasing the number of watercourses which would require crossing. This would increase the complexity, cost and duration of construction. Despite these Corridors being the only options available to route to a Walpole siting area outside of Flood Zone 3 (WLP6), it is not considered that this would outweigh the potential adverse environmental impacts and technical complexities associated with the extended lengths of the Corridors, and as such use of the Corridors is not preferred.

3.5.24 Corridors 25, 26 and 27 were also considered less preferred. Crossing the A151 west of Weston as part of these Corridors would increase the length of the Corridor and necessitate additional crossings of both the existing 2WS and 4ZM 400 kV overhead lines. Furthermore, in crossing the A151 west of Weston, these Corridors would also introduce temporary visual impacts on denser settlement areas at both Weston and Spalding which can be avoided by routeing within the other Corridors.

3.5.25 Of the remaining Corridors, Corridors 29 and 30 are likely to have marginally longer routes compared to Corridors 31, 32, 33 and 34 due to the divergence of the Corridors to the south of Sutton St James and Tydd St Giles, before entering the Walpole siting area. Both Corridors are also likely to require multiple crossings of the South Level Main Drain and North Level Main Drain, as well as a greater number of road crossings when compared to the remaining Corridors. Moreover, both Corridors have considerable overlap with the Grimsby to Walpole Project preferred corridor which cannot be avoided.

3.5.26 Overall, there is little to differentiate between remaining Corridors 31, 32 and 33 (including the section of Corridor 34, south of the A17). As such, it was considered that a combination of the remaining Corridors would be preferred as they offer the shortest and most direct route to the Walpole siting areas whilst also offering the opportunity to utilise routeing along the A17 to reduce the potential environmental impacts and technical constraints during construction. Although utilisation of a route along the A17 would likely introduce increased traffic and transport effects to users of this primary road in the area, it would potentially bring comparative benefits to ecology, heritage, water and landscape (due to low disruption on habitats, heritage assets, the water environment and by utilising previously developed land), subject to engineering studies. It would also be beneficial from an accessibility perspective. Corridors 31, 32, 33 (including the section of Corridor 34, south of the A17) are therefore the emerging preferences for the underground cable routes between the River Welland and Walpole.

Siting Zones Options Appraisal - Walpole converter stations and new Walpole substation

3.5.27 The Walpole siting zones were developed through definition of a study area (Step 1), mapping and weighting of features (Step 2 and Step 3), and an iterative identification, review and refinement process (Steps 4, 5 and 6). They were developed to accommodate two converter stations (one for each of the EGL 3 and EGL 4 projects) each of which could require areas in order of 350 m by 300 m (approximately 11 hectares (ha)) and a 400 kV AIS substation (to be consented as part of the EGL 3 and EGL 4 or the Grimsby to Walpole Project), which could extend approximately 800 m by

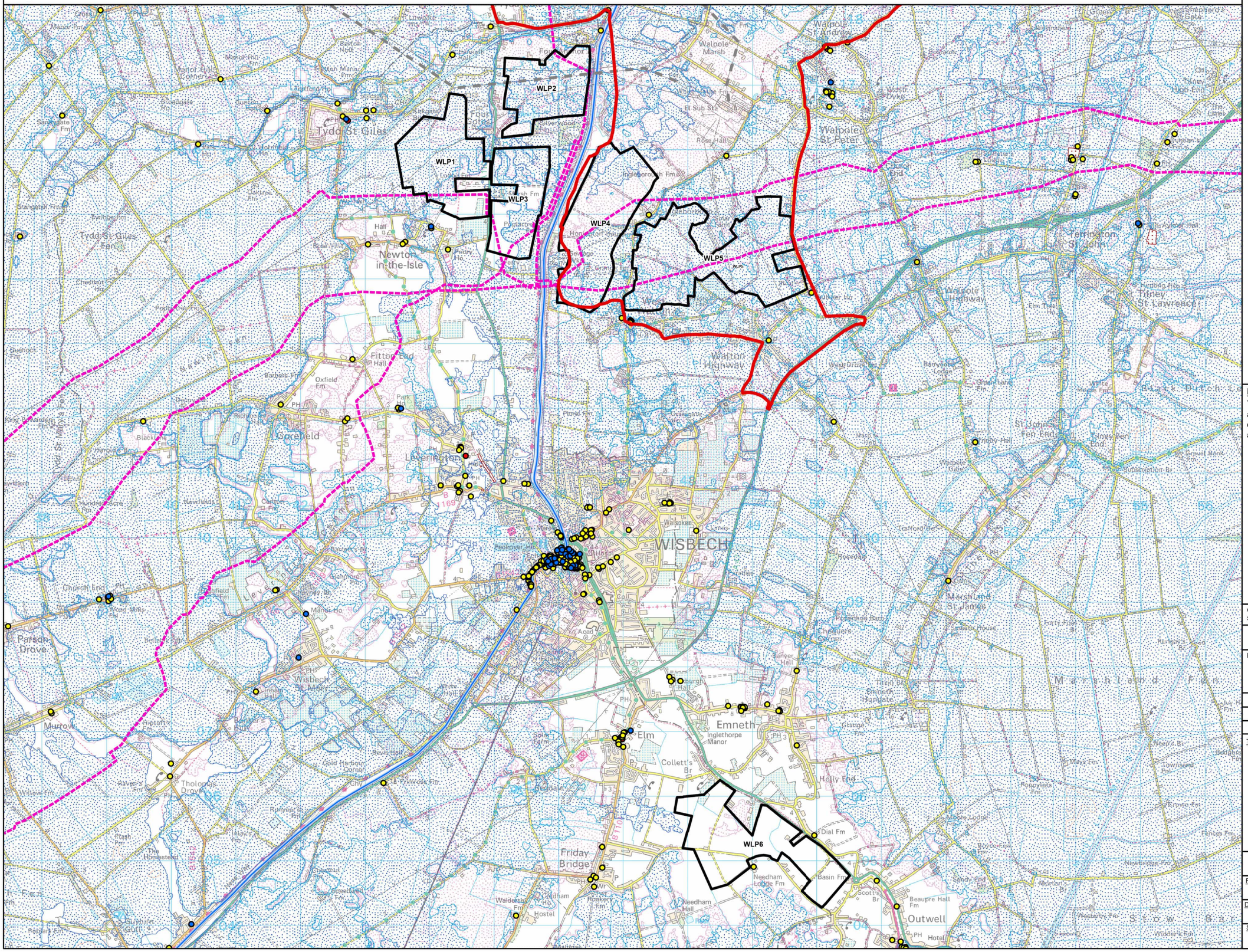
200 m (approximately 16 ha). The siting zone options (see **Figure 3-10 to Figure 3-12**) progressed for appraisal comprise:

- Siting zone WLP1 – an area, approximately 1.8 km by 1.4 km (approximately 252 ha), located west of the A1101, southeast of the North Level Main Drain and north of Newton – in – the- Isle.
- Siting zone WLP2 - an area, approximately 1.3 km by 1.1 km (approximately 143 ha), located west of the River Nene, east of the A1101, northwest of the Wisbech Compressor Gas (Wisbech Compressor) Station and southwest of Foul Anchor.
- Siting zone WLP3 - an area, approximately 1.7 km by 0.9 km (approximately 153 ha), located west of the River Nene, east of the A1101 and Newton, northwest of the Wisbech Compressor Station and southwest of Foul Anchor.
- Siting zone WLP4 – an area, approximately 2.5 km by 0.9 km (approximately 225 ha), located east of the River Nene, southeast of the existing Walpole substation and northwest of West Walton.
- Siting zone WLP5 - an area, approximately 2.7 km by 1.5 km (approximately 405 ha), located directly south of the Rose and Crown Solar Farm, north of Walton Highway and West Walton.
- Siting zone WLP6 - an area, approximately 2.5 km by 1.6 km (approximately 400 ha), located southwest of Emneth, northeast of Outwell and east of Friday Bridge.

3.5.28 When considering all features and constraints within the Walpole Converter Station study area, siting zones WLP4, WLP5 and WLP6 offer the best opportunity for flexible siting. Siting zones WLP4 and WLP5 reduce the amount of connection infrastructure required for new HVDC underground cables from the landfalls (as well as new overhead line for the new transmission connection of the Grimsby to Walpole Project). Siting zone WLP6 is located outside of Flood Zones 2 and 3 albeit within an area of extensive field drainage. Despite this, siting zones WLP4 and WLP5 perform slightly better than siting zone WLP6 on technical perspective given their closer proximity to the 400 kV 4ZM overhead line and the existing Walpole substation, and better entries for the HVDC underground cables, despite more road infrastructure being required. The Rose and Crown Solar Farm may pose a technical challenge for siting within WLP5 and the proposed Grantham to Bexwell Pipeline may conflict with siting in WLP6.

3.5.29 WLP1, WLP2 and WLP3 were identified as least preferred. The concentration of existing infrastructure within the siting zones would limit the flexibility for siting (such as orientations), increase the complexity of construction and, in the case of WLP2, would likely result in outages being required during construction. Use of siting zones WLP1, WLP2 and WLP3 would also require use of a narrower area of Corridor from the west (south of Tydd St Giles). Within this area the DC cables would require crossing the North Level Main Drain, a gas main and would be near the Grimsby to Walpole Project's overhead line, substantially increasing the technical complexities of entries to siting zones WLP1, WLP2 and WLP3.

Figure 3-10
Walpole Siting Zones Locations, Existing Infrastructure and Environmental Features



Legend

- Scoping Boundary
- Walpole Siting Zone

Listed Buildings

- Grade I
- Grade II
- Grade II*
- Gas Pipeline
- Northern Power Grid 132kV Overhead Line
- Existing 132kV Overhead Line
- Scheduled Monument
- Main River
- Flood Zone 2
- Flood Zone 3

Notes

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Coordinate System: British National Grid
Sheet X Centroid Coordinate: 546993.27E Sheet Y Centroid Coordinate: 310941.23N

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1	10/07/2024	DRAFT	EP	BS	JB

Title

Figure 3-10
Walpole Siting Zones Locations, Existing Infrastructure and Environmental Features

nationalgrid

Figure Number	Drawing Reference	Scale	Sheet Size	Sheet	Issue
Figure 3-10	EGL-WSP-CONS-XX_DR-G-019 P01	1:56,000	A3	SHEET 1 OF 1	1

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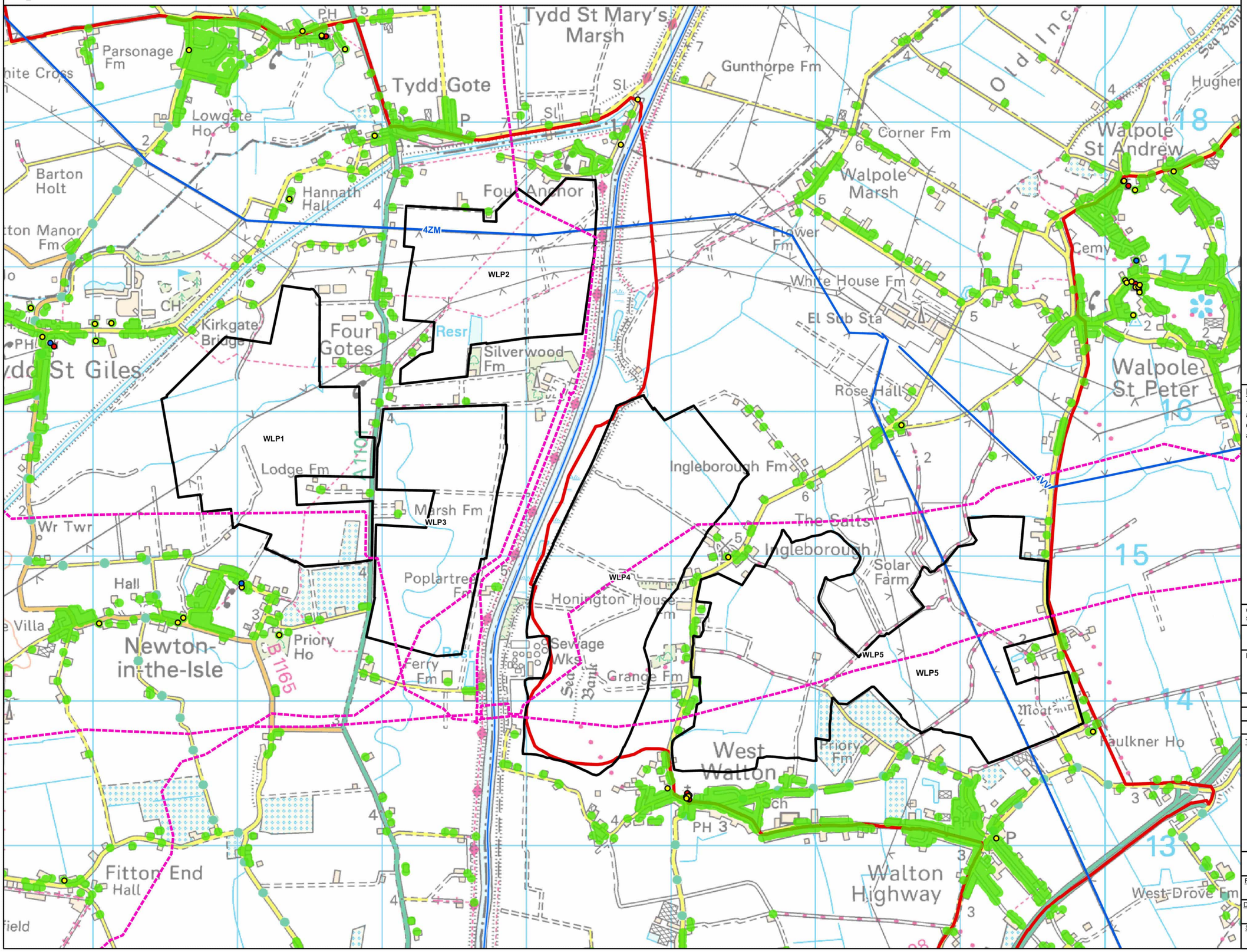
Figure 3-11
Siting Zone WLP1-WLP5 Location, Existing Infrastructure and Environmental Features



Legend

- Scoping Boundary
- **Listed Buildings**
  - Grade I
  - Grade II
  - Grade II*
- Gas Pipeline
- Walpole Siting Zone
- Scheduled Monument
- Ancient Woodland
- Main River
- Existing 400kV Overhead Line
- Residential Receptor

Notes

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Kilometres

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Title

Figure 3-11
Siting Zone WLP1-WLP5 Location, Existing Infrastructure and Environmental Features

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Figure Number	Drawing Reference	Scale	Sheet Size	Sheet	Issue
Figure 3-11	EGL-WSP-CONS-XX_DR-G-020 P01	1:25,000	A3	SHEET 1 OF 1	1

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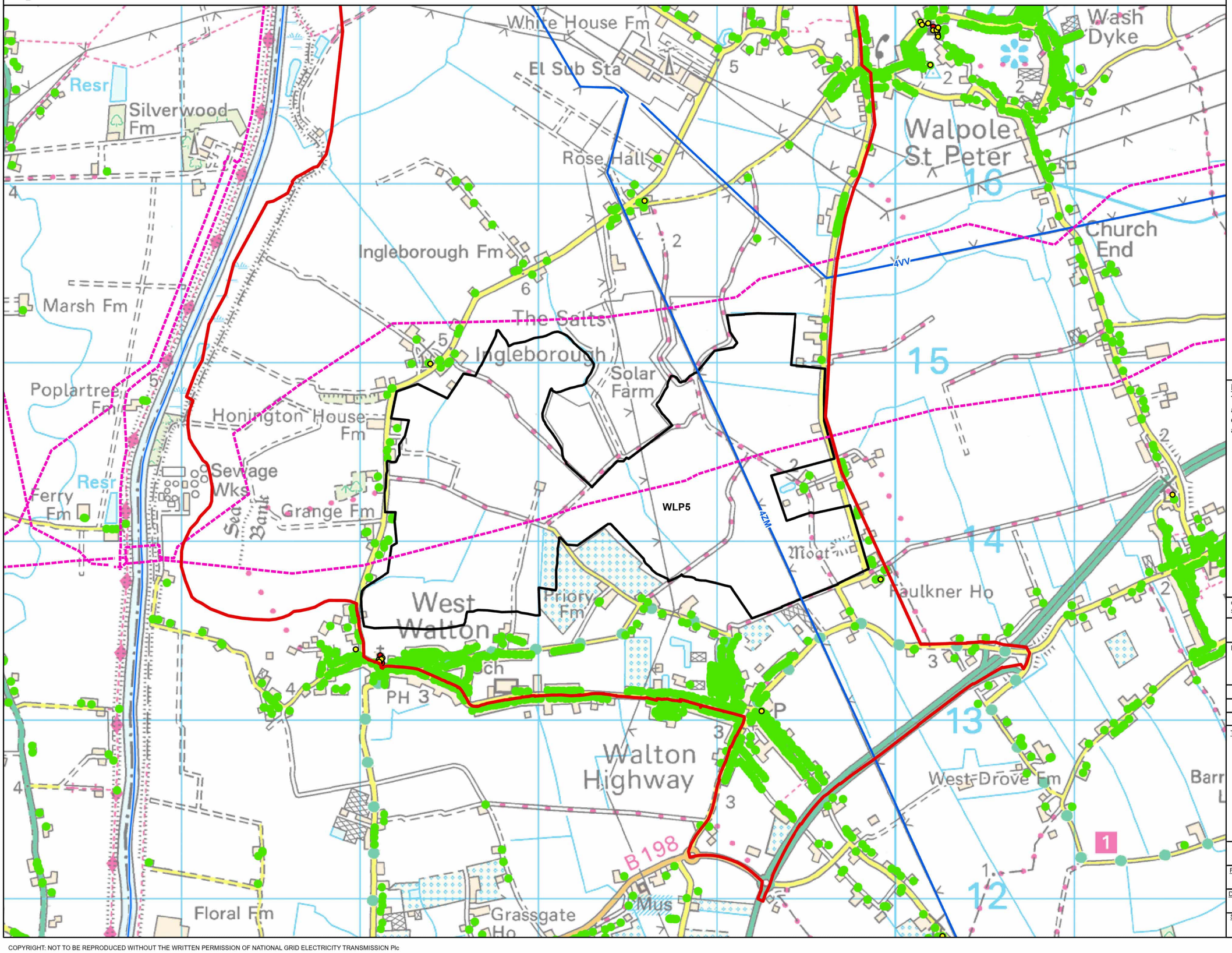
Figure 3-12
Siting Zone WLP6 Location, Existing Infrastructure and Environmental Features



Legend

- Scoping Boundary

Listed Building

- Grade I
- Grade II
- Grade II*
- Gas Pipeline
- Scheduled Monument
- Ancient Woodland
- Main River
- Existing 400kV Overhead Line
- Walpole Siting Zone
- Residential Receptor
- Grantham to Bexwell Pipeline

Notes

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Kilometres

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Title

Figure 3-12
Siting Zone WLP6 Location, Existing Infrastructure and Environmental Features

nationalgrid

Figure Number	
	Figure 3-12
Drawing Reference	EGL-WSP-CONS-XX_DR-G-021 P01

Scale	Sheet Size	Sheet	Issue
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Siting Zones Options Appraisal - DCSS and converter station in the vicinity of the LCS

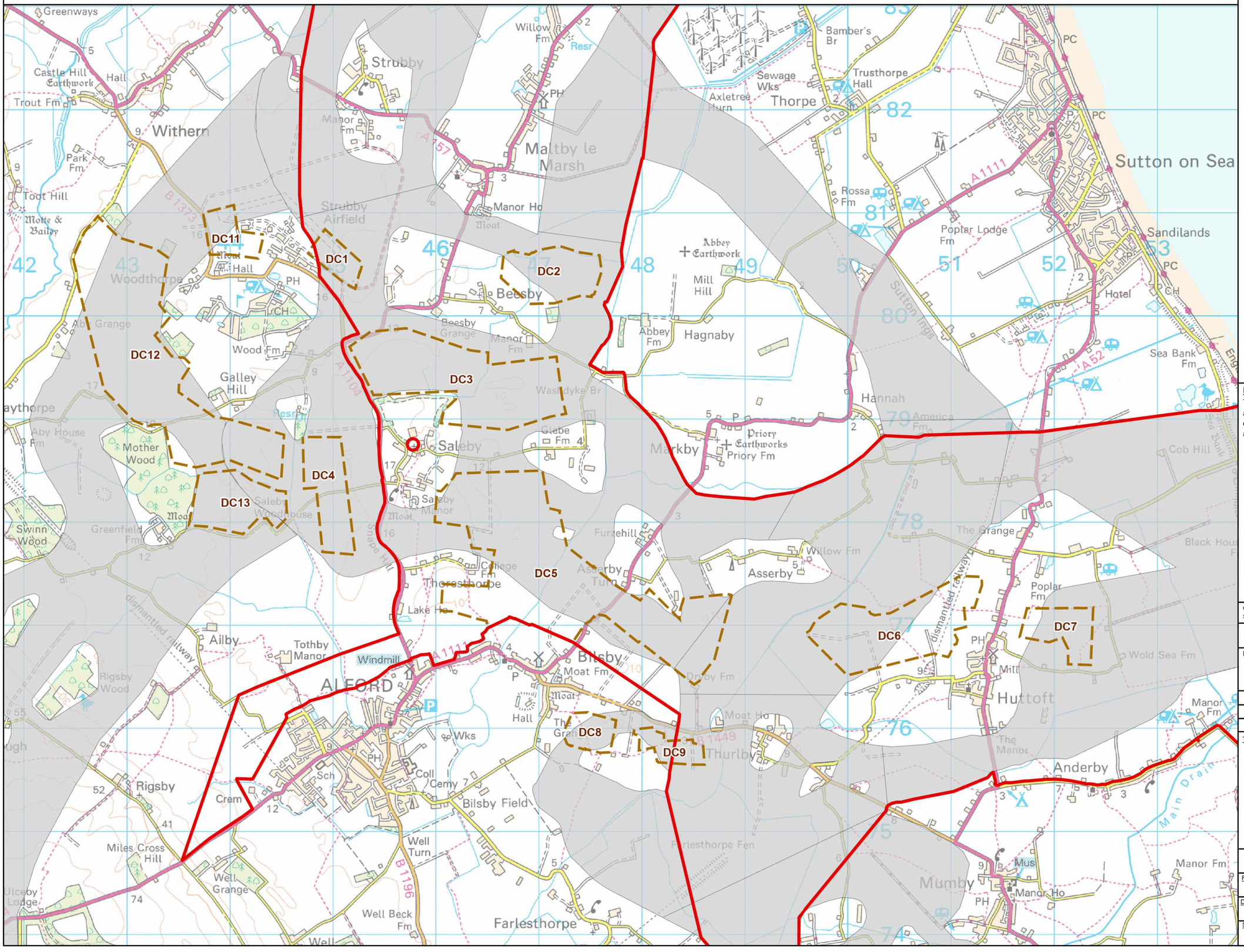
3.5.30 The LCS converter station siting zones were developed through the definition of a study area (Step 1), mapping and weighting of features (Step 2 and Step 3), and an iterative identification, review and refinement process (Steps 4, 5 and 6). The LCS converter station siting zones were developed to accommodate a converter station approximately 350 m by 300 m (approximately 11 ha) and a DCSS 190 m by 100 m (approximately 2 ha). The siting zones (see **Figure 3.13: LCS Converter Station Siting Zone locations** progressed for options appraisal, comprised:

- Siting zone DC1: an area which is approximately 550 m by 250 m (approximately 14 ha) and is located immediately east of Woodthorpe. The siting zone is approximately 850 m west of the A1104 and 950 m east of the B1373.
- Siting zone DC2: an area approximately 890 m by 380 m (approximately 34 ha) and is located adjacent to Beesby to the northeast. The A1104 is approximately 550 m to the east.
- Siting zone DC3: an area which is approximately 1.95 km by 580 m (approximately 113 ha), and it is located approximately 220 m north of Saleby. The A1104 overlaps with the northwestern boundary of the siting zone.
- Siting zone DC4: an area approximately 1.13 km by 360 m (approximately 41 ha) and is located approximately 650 m west of Saleby. This siting zone overlaps Greenfield Lane, and the Wold Grift Drain is approximately 150 m to the west.
- Siting zone DC5: an area which is approximately 2.95 km by 1.36 km (approximately 401 ha) and is located approximately 300 m north of Bilsby and approximately 190 m east of Thoresthorpe. The siting zone overlaps with the Wold Grift Drain and the A1111.
- Siting zone DC6: an area which is approximately 1.8 km by 600 m (approximately 108 ha) and located west (approximately 100 m) of Huttoft. The siting zone is approximately 240 m west of the A52.
- Siting zone DC7: an area which is approximately 640 m by 560 m (approximately 36 ha) and is located approximately 550 m northeast of Huttoft. It is approximately 260 m east of the A52.
- Siting zone DC8: an area which is approximately 460 m by 300 m (approximately 14 ha) and is located between Alford (1.45 km east of Alford) and Thurlby (approximately 1.42 km west of Thurlby) and approximately 280 m southeast of Bilsby. The B1449 is immediately north of the siting zone.
- Siting zone DC9: an area east of siting zone DC8 which is approximately 700 m by 320 m (approximately 22 ha) and is located between Alford (approximately 2.2 km west) and Thurlby (approximately 600 m east) and approximately 1 km southeast of Bilsby. The B1449 is immediately north of the siting zone.
- Siting zone DC11: an area which is approximately 390 m by 480 m (approximately 19 ha) and is adjacent to Woodthorpe (to the south). The siting zone is adjacent to the B1373.
- Siting Zone DC12: an area approximately 2.5 km by 1.45 km (approximately 363 ha) and is located between Claythorpe (approximately 1.1 km southwest) and

Woodthorpe (approximately 470 m east). Wold Grift Drain routes 80 m to the south of the siting zone.

- Siting Zone DC13: an area which is approximately 830 m by 530 m (approximately 44 ha). This is located approximately 1 km north of Alby and is adjacent to Greenfield Lane which routes to the south. Wold Grift Drain routes adjacent to the siting zone to the northeast.

Figure 3-13
LCS Converter Station Siting Zone locations



Legend

- Scoping Boundary
- LCS Converter Station
- EGL 3 and EGL 4 Preliminary Corridors

Notes

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Kilometres

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Figure 3-13
LCS Converter Station Siting Zone locations

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Figure Number	Drawing Reference		
Figure 3-13	EGL-WSP-CONS-XX_DR-G-022 P01		
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3.5.31 Following comparative appraisal of the LCS converter station siting zones, siting zones DC1, DC7, DC8, DC9, DC11 were identified as least preferred in the CPRSS due to the limited flexibility for siting, and therefore potential increased technical complexity for siting within these zones. The limited flexibility for siting within these zones may mean that potential environmental and socio-economic impacts cannot be avoided or adequately mitigated.

3.5.32 Siting zones DC4, DC12, and DC13 are less preferred as these siting zones would increase the deviation, and therefore increase the length of, HVDC underground cable connections from the new landfalls and on to the new Walpole converter stations. This additional length of underground cabling would increase the risk of encountering technical constraints and increase the likelihood of potential adverse environmental and socio-economic impacts.

3.5.33 On balance, DC5 is considered the optimal and most preferred siting zone. Locating the proposed LCS converter station (and DCSS) within DC5 offers the opportunity to be located near to one of the proposed LCS 400 kV substations. From an environmental perspective, the co-location of infrastructure is considered preferable to reduce the spread of potential impacts across the wider region. From an engineering perspective, this would offer opportunities in terms of shared infrastructure (such as haul roads). DC5 also allows for the shortest deviations of underground HVDC cables between the new landfall at Theddlethorpe or Anderby Creek and onward routeing towards Walpole.

3.5.34 While DC5 does have constraints i.e. from a hydrological (presence of Wold Grift Drain), and existing/proposed infrastructure (Viking Link Interconnector) perspective, it is considered that the size of the siting zone is such that these constraints could be avoided and/or adequate mitigation could be implemented to reduce the magnitude of potential impact.

Options Selection

3.5.35 Following options appraisal of the landfalls, corridors, siting zones and siting areas (Chapter 6 to Chapter 9 in the CPRSS), an end-to-end review was then undertaken between the landfalls and Walpole (and via the LCS). This review considered each preferred corridor, siting zones or siting area in the context of the wider end-to-end solution. The reasoning and justification for progressing each individual element was tested to ensure that it remained robust when considered in the context of the whole route. The wider end-to-end solution review also incorporated cost and programme performance, reported in Chapter 12 of the CPRSS. A challenge and review workshop was also held and attended by NGET, the FEED Contractor and the environmental specialists. The purpose of the workshop was to review environmental preferences and, in accordance with EN-1 and EN-5, balance these against technical and cost inputs to reach a conclusion on the emerging preferred corridor, siting zones and siting areas. The aim being to conclude upon options which provide the optimum balance of efficiency and economy, whilst having appropriate regard to environmental and socio-economic impacts.

3.5.36 In summary, the emerging preferred siting areas, siting zones and corridor for new underground cables, as identified within the CPRSS are as follows:

- **Landfall** – Anderby Creek was identified as the preferred landfall location over Theddlethorpe and Horseshoe Point. Anderby Creek offers the best opportunity for landfall installation particularly from an ecological perspective and it poses fewer

onshore engineering constraints. However, when considering the potential additional ecological and socio-economic effects from multiple landfalls at Anderby Creek alongside the complexities associated with offshore routeing (as detailed in the Marine Route Options Appraisals[6,7] undertaken for EGL 3 and EGL 4), the preference over a landfall at Theddlethorpe is reduced. The option of making landfall at Theddlethorpe has therefore been retained to be progressed at non-statutory consultation, and subject to further studies, as an alternative.

- **Connection between the Landfalls and Walpole** – the connection routes between either Theddlethorpe or Anderby Creek and Walpole, and where a three-ended connection is a requirement via the LCS Converter Station.
    - As described in Chapter 7 of the CPRSS, 26 underground cable corridors (1-23 and 35-37) were defined and reviewed between the Landfall study areas (at Theddlethorpe and Anderby Creek) and the River Welland. The emerging preferred corridor comprises the following corridors from each landfall:
        - Theddlethorpe landfall via Corridors 1, 3, 6, 7, 8, 16, and 21 to the River Welland; and
        - Anderby Creek landfall via Corridors 3, 4, 5, 6, 7, 8, 16, and 21 to the River Welland.
- **New Walpole Substation and Converter Stations** - Siting zones WLP4 and WLP5 have been identified as the emerging preferences. These siting zones offer the greatest opportunity to limit the extent of environmental effects by co-location of the new Walpole converter stations with the new Walpole 400 kV substation. Co-location would also reduce the technical complexity during construction and operation and limit the length of connections for the Projects and the proposed Grimsby to Walpole Project. The siting zones also best align with the Horlock Rules and Holford Rules.
- **New LCS Converter Station and DCSS** – of the 13 siting zones considered (DC1-DC13) the zone identified as most suitable for the LCS converter station and DCSS was siting zone DC5. This siting zone offers the best opportunity to limit potential landscape and visual effects in-combination by aiming to co-locate infrastructure near the preferred LCS 400 kV substation (proposed as part of the Grimsby to Walpole Project). Siting at DC5 would also help to reduce the potential for other environmental and socio-economic effects whilst minimising the length of underground cable required (from identified landfalls) as well as technical complexity during construction and operation.

3.5.37 Following the identification of the preferred route corridor and preferred siting areas, a ‘graduated swathe’ has been identified within these which took into consideration environmental and socio-economic constraints, the Holford and Horlock Rules and technical considerations. The graduated swathes indicate the broad areas where the proposed new infrastructure is likely to be located. The darker areas of the graduated swathe indicated a greater preference for the location of the required infrastructure.

3.5.38 The preferred Landfall study areas, corridor, siting zones and the graduated swathes within these areas are shown in **Figure 3.14 Zones and Corridor**. Further information on the justification behind the selection of these locations is provided in the CPRSS.

3.5.39 Since the publication of the SOR and the CPRSS, and following further work in 2024, including the ESO’s HND Follow Up Exercise, NGET has determined that that should a three ended-connection be required to the LCS in the future, this would be part of EGL

4 (which is being jointly developed by NGET and SPEN). However further detailed studies are required to confirm the requirement for the three-ended connection.

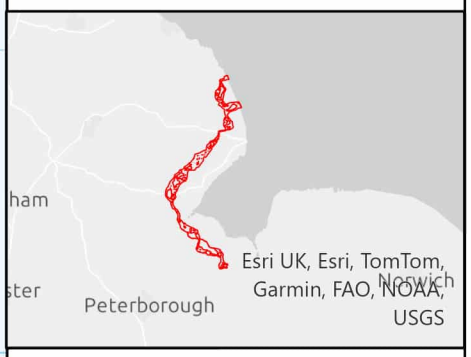
3.5.40 **Part 2, Chapter 4: English Onshore Scheme** of this Scoping Report describes the English Onshore Scheme at its current stage of development, i.e. the 'end-to-end solution', which was identified as preferred within the CPRSS. Owing to the iterative nature of the EIA process, it is acknowledged that the English Onshore Scheme may evolve from that which is presented in this Scoping Report. In accordance with Schedule 4 of the EIA Regulations, the ES will build upon the consideration of alternatives presented in this Scoping Report, detailing how the design of the English Onshore Scheme has evolved (for example in terms of development design, technology, location, size and scale) in response to environmental features and technical challenges during the EIA process.

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend

- Existing 400kV Overhead Line
- Existing Substation Site
- Preferred Cable Corridor
- Preferred Lincolnshire Connection Substations (LCS) Converter Station and Direct Current Switching Station (DCSS) Siting Zone
- Walpole Substation and Converter Stations Siting Zone
- Anderby Creek Preferred Landfall
- Theddlethorpe Preferred Landfall

Graduated Swathe



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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX_DR-G-025 P01		
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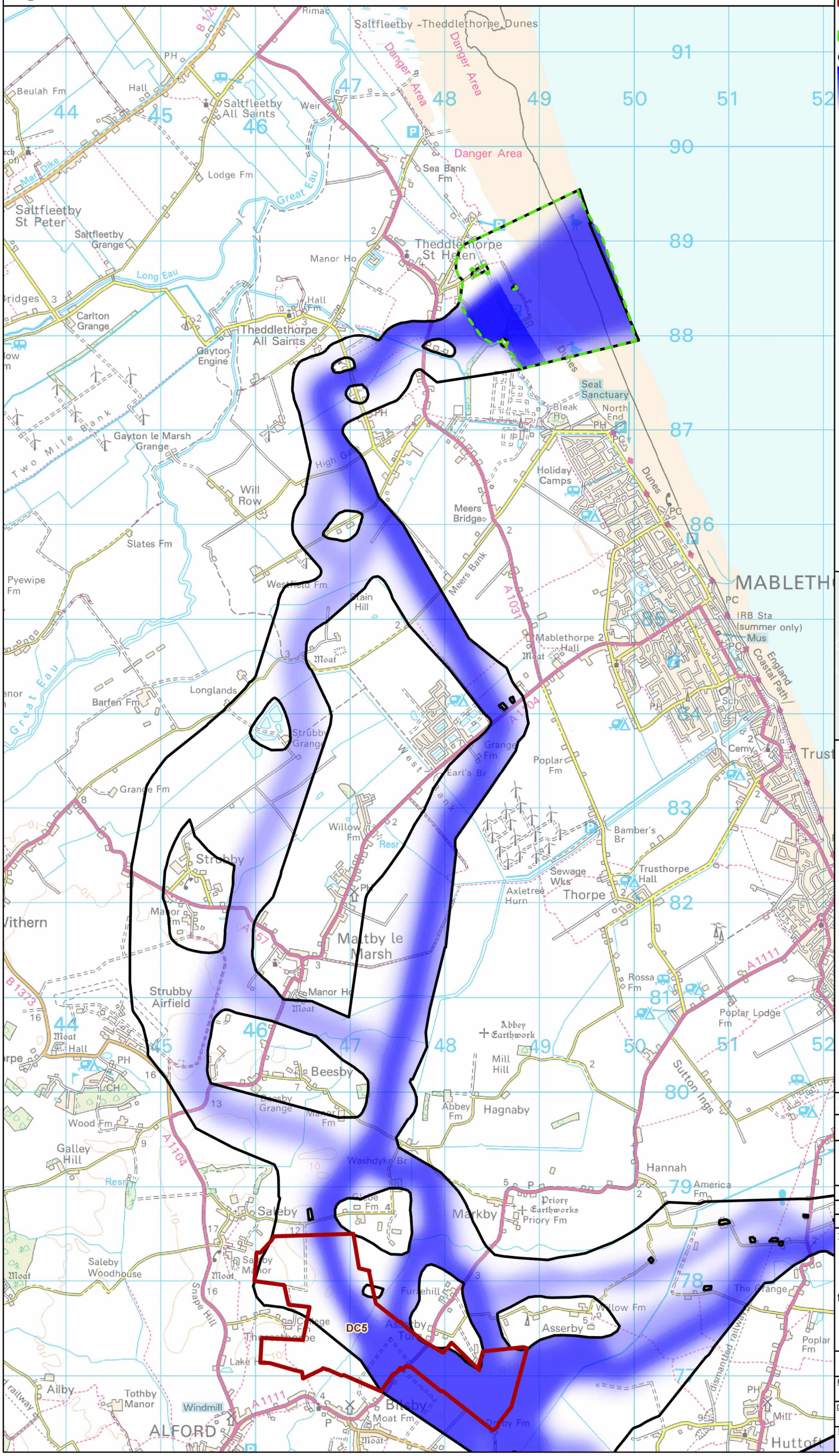
Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor



Legend

- Preferred Cable Corridor
- Preferred Lincolnshire Connection Substations (LCS) Converter Station and Direct Current Switching Station (DCSS) Siting Zone
- Theddlethorpe Preferred Landfall
- Graduated Swathe

Notes

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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number
Figure 3-14

Drawing Reference
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Scale	Sheet Size	Sheet	Issue
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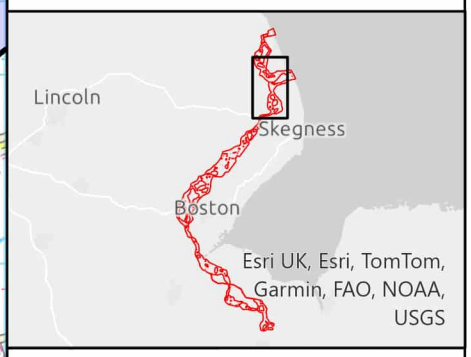
Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend

Preferred Cable Corridor

Preferred Lincolnshire Connection Substations (LCS) Converter Station and Direct Current Switching Station (DCSS) Siting Zone

Graduated Swathe



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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX-DR-G-025 P01		
Scale	**Sheet Size**	**Sheet**	**Issue**
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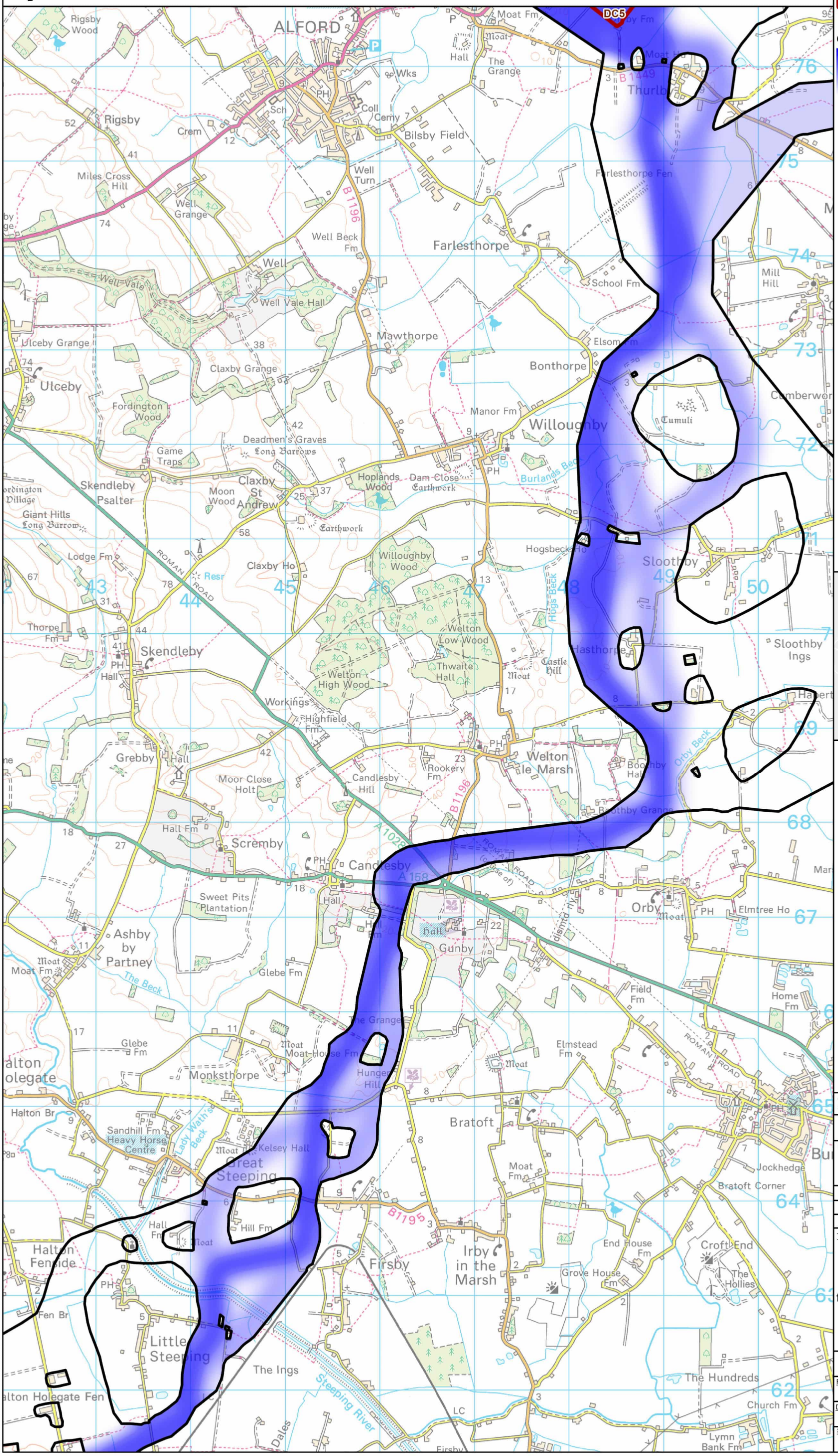
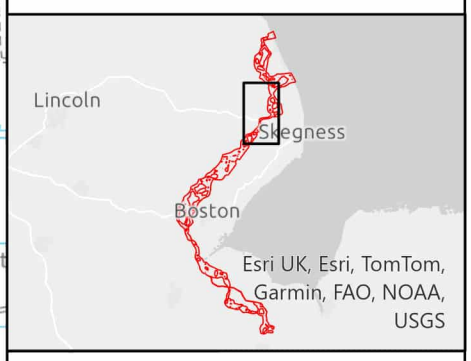
Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor





Legend

- Preferred Cable Corridor
- Preferred Lincolnshire Connection Substations (LCS) Converter Station and Direct Current Switching Station (DCSS) Siting Zone
- Graduated Swathe

Notes

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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number
Figure 3-14

Drawing Reference
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Scale	Sheet Size	Sheet	Issue
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Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend

Preferred Cable Corridor

Graduated Swathe

Notes

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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX-DR-G-025 P01		
Scale	Sheet Size	Sheet	Issue
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Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend

Preferred Cable Corridor

Graduated Swathe

Notes

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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number: Figure 3-14

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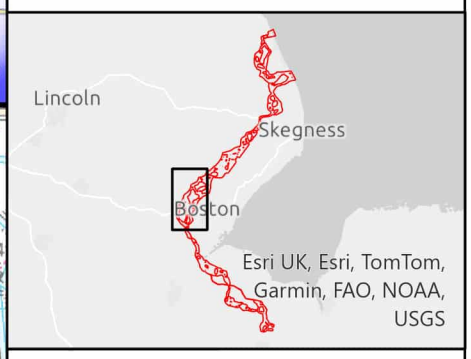
Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend

Preferred Cable Corridor

Graduated Swathe



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Issue	Date	Remarks	Drawn	Checked	Approved
1	19/04/2024	DRAFT	NM	BS	JB

Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX-DR-G-025 P01		
Scale	Sheet Size	Sheet	Issue
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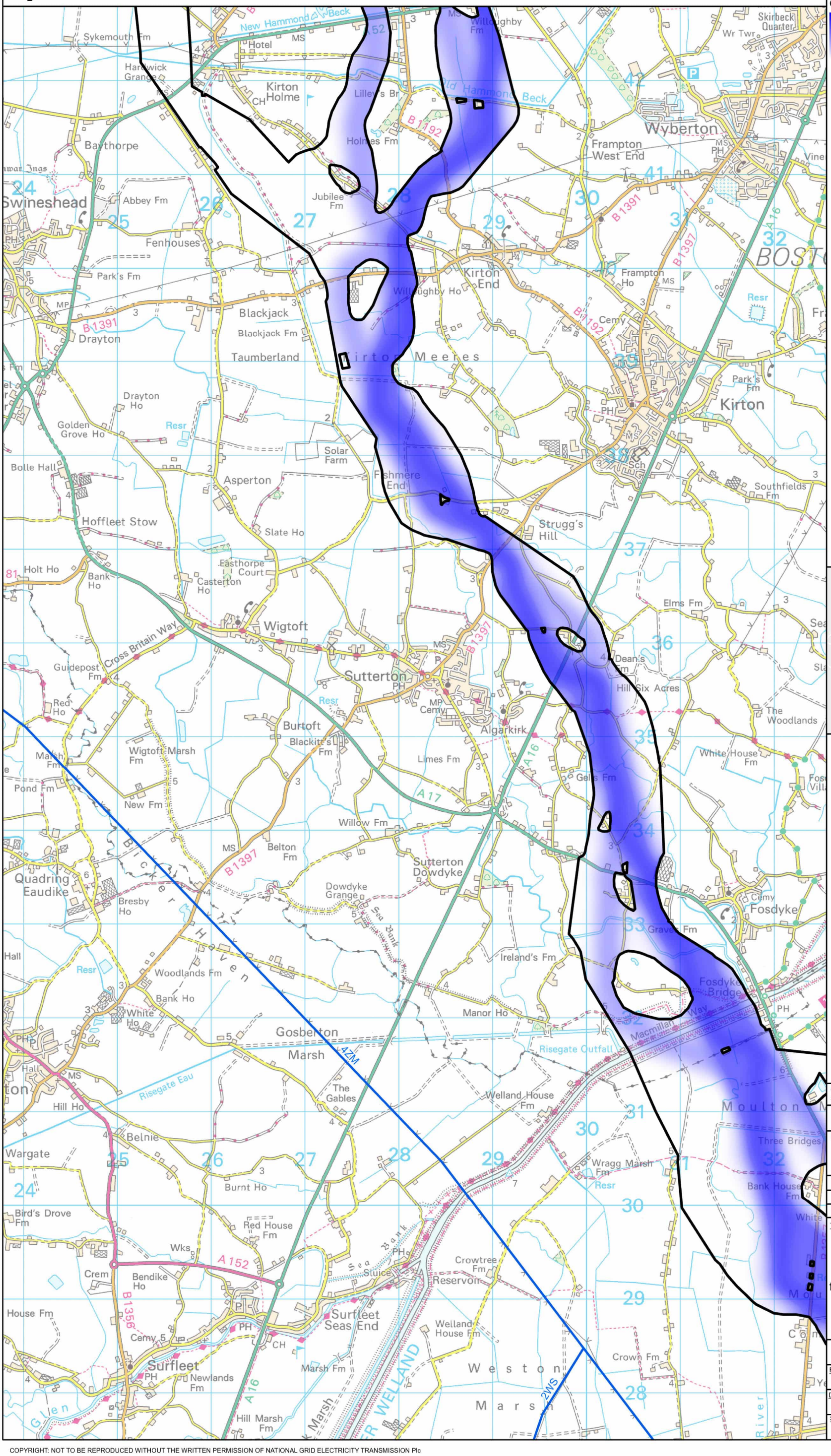
Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend
- Existing Overhead Line 400kV
- Preferred Cable Corridor
- Graduated Swathe



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Issue	Date	Remarks	Drawn	Checked	Approved
1	19/04/2024	DRAFT	NM	BS	JB

Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX-DR-G-025 P01		
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Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend
- Existing Overhead Line 400kV
- Preferred Cable Corridor
- Graduated Swathe

Notes
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Issue	Date	Remarks	Drawn	Checked	Approved
1	19/04/2024	DRAFT	NM	BS	JB

Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number			
Figure 3-14			
Drawing Reference			
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Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend
- Existing Overhead Line 400kV
- Preferred Cable Corridor
- Graduated Swathe

Notes
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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX-DR-G-025 P01		
Scale	**Sheet Size**	**Sheet**	**Issue**
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Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

Legend
- Existing Substation Site
- Existing Overhead Line 400kV
- Preferred Cable Corridor
- Walpole Substation and Converter Stations Siting Zone

Graduated Swathe

Notes
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Issue	Date	Remarks	Drawn	Checked	Approved
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Title

Figure 3-14
Graduated Swathe and preferences for the Landfall, Siting Zones and Corridor

nationalgrid

Figure Number	Drawing Reference		
Figure 3-14	EGL-WSP-CONS-XX-DR-G-025 P01		
Scale	Sheet Size	Sheet	Issue
1:40,000	A3	SHEET 11 OF 11	1

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Bibliography

Ref 3.1 NGET develops projects through a six-stage process set out in the Approach to Consenting (April 2022) guidance available at https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/planning-and-development. Accessed 14 February 2024

Ref 3.2 National Grid, (April 2024), Eastern Green Link 3 and 4 Strategic Options Report.

Ref 3.3 The Strategic Options Report and Corridor and Preliminary Routeing and Siting Study Report for the Grimsby to Walpole Project are available at https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/grimsby-to-walpole

4. English Onshore Scheme

nationalgrid

4. English Onshore Scheme

4.1 Introduction

4.1.1 This chapter provides an overview of EGL 3 and EGL 4 and presents a description of the main elements of the English Onshore Scheme, including details of design, construction and operation.

4.2 EGL 3 and EGL 4

4.2.1 EGL 3 comprises a 2 GW HVDC link between Aberdeenshire in Scotland, and King's Lynn and West Norfolk in England. EGL 4 comprises a 2 GW HVDC link between Fife in Scotland and King's Lynn and West Norfolk. Each of EGL 3 and EGL 4 comprises over 600 km of subsea and underground HVDC cables between new converter stations at each end of the electricity transmission link. These in turn are connected to the existing NETS via HVAC cables between the new converter stations and new substations. Although EGL 3 and EGL 4 are independent of one another, they are being developed in parallel. This coordinated approach proves the opportunity to potentially reduce the extent of impacts and disturbance compared to EGL 3 and EGL 4 being developed individually.

4.2.2 The existing electricity distribution networks in England and Scotland both operate using predominantly HVAC. However, transmission projects such as EGL 3 and EGL 4 use Direct Current (DC) technology because it is more efficient at transmitting large volumes of electricity over longer distances with lower losses than an equivalent Alternating Current (AC) system. A DC system also provides a greater degree of control over the magnitude and direction of flow. This flexibility brings operational benefits, however, to transmit electricity in DC form, specialist electrical equipment contained within converter stations at either end of EGL 3 and EGL 4 is required to convert from AC to DC (or vice versa).

4.2.3 For the purposes of seeking the necessary consents EGL 3 and EGL 4 have been split into different 'Schemes' i.e. Scottish Onshore Scheme, Scottish Offshore Scheme, English Offshore Scheme and English Onshore Scheme. These Schemes for EGL 3 and EGL 4 are outlined in **Volume 1, Part 1, Chapter 1: Introduction**.

4.2.4 **Volume 1, Part 2**, **English Onshore Scheme**, of this EIA Scoping Report is written with specific regard to the English Onshore Scheme, located in the East Midlands and East of England regions of England. A detailed overview of the English Offshore Scheme is provided in **Volume 1, Part 3, Chapter 20: English Offshore Scheme** of this Scoping Report.

4.2.5 The English Onshore Scheme would comprise the construction of:

- EGL 3 Project
  - a new converter station, in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk;

- approximately 100 km of new underground HVDC cable, from the landfall point (at either Theddlethorpe or Anderby Creek) to the proposed EGL 3 converter station in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk;
- approximately 5 km of new underground HVAC cable, between the EGL 3 Walpole converter station and a new 400 kV Walpole substation in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk.

- EGL 4 Project
  - a new converter station, in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk;
  - a new LCS converter station (should the requirement for a three-ended connection be confirmed);
  - a new LCS DCSS (should the requirement for a three-ended connection be confirmed);
  - approximately 0.2 km of new underground HVDC cable, from the DCSS to a proposed converter station in the vicinity of the proposed LCS; and
  - approximately 90 km of new underground HVDC cable, from the DCSS to the proposed EGL 4 converter station in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk.
  - approximately 5 km of new underground HVAC cable, between the LCS converter station and one of the proposed LCS considered as part of the NGET Grimsby to Walpole Project; and
  - approximately 5 km of new underground HVAC cable, between the EGL 4 Walpole converter station and a new 400 kV Walpole substation in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk.

4.2.6 To connect the Projects into the NETS, a new 400 kV substation in the vicinity of the existing Walpole substation in King's Lynn and West Norfolk District will be required i.e. the new Walpole substation (also known as Walpole B substation). The new Walpole substation is required to facilitate the connection of both the Grimsby to Walpole Project and the EGL 3 Project and the EGL 4 Project (as identified in **Volume 1, Part 1, Chapter 1: Introduction**) and will therefore serve as a common connection point. The need for the new Walpole substation exists as a part of either EGL 3 and EGL 4 or the Grimsby to Walpole Project and therefore will form part of their respective DCOs.

4.2.7 The new Walpole substation would be required to connect into the existing Burwell to Walpole 4ZM 400 kV overhead line. Supplementary works to the existing 400 kV may be required to enable a connection with the new Walpole substation.

4.3 Overview of the English Onshore Scheme

4.3.1 As outlined in **Volume 1, Part 1, Chapter 1: Introduction** and **Section 4.2** above, the English Onshore Scheme of EGL 3 and EGL 4 extends from MLWS where the English Offshore Scheme (see **Volume 1, Part 3 English Offshore Scheme**) makes landfall at the Lincolnshire coastline to the proposed converter stations and proposed substation in the vicinity of the existing Walpole substation. It is noted that the boundaries for the

English Onshore Scheme and the English Offshore Scheme both overlap in the intertidal zone between MLWS and MHWS.

Design envelope approach for EIA scoping

4.3.2 Whilst the infrastructure which will be needed to construct the English Onshore Scheme has been identified, the exact siting has not yet been confirmed. Therefore a 'design envelope' approach has been adopted for EIA Scoping having regard to the Planning Inspectorate's Advice Note Nine (Ref 4.1). This approach, known as the 'Rochdale Envelope' Approach, is employed "*where the nature of the proposed development means that some details of the whole project have not been confirmed*" and "*flexibility is sought to address uncertainty.*" Further details with regards to the Rochdale Envelope Approach are provided in **Part 1, Chapter 5: EIA Approach and Methodology**.

4.3.3 As described in **Section 3.5** the CPRSS study identified a preferred corridor, siting zones, siting areas and landfalls. Preliminary routes for the new underground cables and emerging preferences for the converter stations and substations were also developed, which are shown as a 'graduated swathe'. For the purposes of non-statutory consultation, the graduated swathe was split into its different infrastructure elements; one for the landfalls, one for the corridor and one for the siting zones. The outputs of the CPRSS form the basis of the first round of public consultation for the English Onshore Scheme. Therefore, a final preferred option for the alignment of the underground cables and sites of the converter stations, substation and switching station has not yet been confirmed.

4.3.4 To retain flexibility, a Scoping Boundary for the English Onshore Scheme has been defined to represent the maximum extent of development (**Figure 1-7 English Onshore Scheme Scoping Boundary**) to incorporate all known integral and associated development that NGET will be seeking consent for as part of the DCO. Unlike the CPRSS which solely considered the potential locations for new permanent infrastructure (accounting for an immediate construction swathe), the Scoping Boundary has been expanded to accommodate all potential temporary and permanent land likely to be required to construct and operate the English Onshore Scheme. As such, the Scoping Boundary differs from that which is presented within the CPRSS. At this stage of the English Onshore Schemes design, the Scoping Boundary covers a wider area than is likely to be required for the DCO. This is to allow design flexibility for the following reasons:

- to take account of ongoing engineering and detailed design development;
- to allow for design changes in light of on-going environmental surveys and assessment; and
- to take account of feedback received through engagement, including through consultation events with the public, key stakeholder meetings and discussions with landowners.

4.3.5 The Scoping Boundary was determined by taking into account the following requirements:

- Construction works at the landfall: The Scoping Boundary has incorporated all land from MLWS that may be required to facilitate the work, including construction compounds and accesses.

- Construction works for the HVDC underground cables between Section 1 (Landfalls to Bilsby) and Section 8 (Foul Anchor to Walpole): The location of the construction compounds and the access routes for the works in these Sections have yet to be determined. Therefore, the Preferred Corridor, as defined within the CPRSS, has been extended to accommodate minor access roads (i.e. not an A-road, B-road or motorway) where widening and / or creation of passing places may be required to accommodate construction traffic movements. The extension of the Scoping Boundary also accommodates a Limit of Deviation (LoD) as it is possible that further micro-siting may be required during the construction process to reflect localised land, engineering and environmental features, and therefore the LoD allows for further design amendments in this regard.
- Construction works at the Walpole Stations Area: The Scoping Boundary has incorporated all land that may be required to facilitate the works, including construction compounds and accesses.
- Construction works at the LCS Converter Station Area: The Scoping Boundary has incorporated all land that may be required to facilitate the works, including construction compounds and accesses.

4.3.6 Works to existing 400 kV overhead lines may also be required to facilitate construction of the English Onshore Scheme. The extent of these works has yet to be determined. However, as the Scoping Boundary has been defined to accommodate construction works at the Walpole Stations area this is considered likely sufficient to cover works to facilitate construction works for existing 400 kV overhead lines.

4.3.7 The English Onshore Schemes design will be refined as it continues to evolve through the subsequent stages of the design and EIA process. Additionally, whilst sensitive environmental receptors are included within the EIA Scoping Boundary (including residential properties and listed buildings) these would be avoided as detailed design progresses.

4.4 Scoping area description

Overview of scoping area

4.4.1 **Figure 1-7 English Onshore Scheme Scoping Boundary** shows the location of the English Onshore Scheme Scoping Boundary, which is located within Lincolnshire, Norfolk and Cambridgeshire. To provide clarity during reporting, the Scoping Boundary includes 11 key areas of focus which have largely been defined by geographical features and / or Project elements. These key areas comprise the Walpole Stations Area, LCS Converter Station Area, the landfalls, and the eight underground cable route sections (Section 1 to Section 8). The breakdown of these route sections is presented in **Part 1, Chapter 1: Introduction**, **Section 1.4** and the following text provides an overview of each of these route sections, as illustrated in **Figure 1-7 English Onshore Scheme Scoping Boundary** and **Figure 1-8 Key Elements of the English Onshore Scheme**.

4.4.2 The Scoping Boundary extents into six local authority boundaries:

- East Lindsey District Council;
- Boston Borough District Council;

- South Holland District Council;
- Borough Council of King's Lynn and West Norfolk;
- Lincolnshire County Council; and
- Norfolk County Council.

4.4.3 The Scoping Boundary is also located within approximately 40 m of the Fenland Council and Cambridgeshire County Council local authority boundaries.

4.4.4 A description of each of the key areas and route sections which comprise the Scoping Boundary is outlined below. The descriptions provide in insight into some of the key environmental features and constraints within each area/section. Best and most versatile (BMV) agricultural land is largely present across the Scoping Boundary apart from areas defined as urban; as such, BMV is not included in the following descriptions.

Walpole Stations Area

4.4.5 The Walpole Stations Area is located within Section 8: Foul Anchor to Walpole of the Scoping Boundary, between the existing Walpole substation, south of Walpole Marsh and the A47, south of Walton Highway and largely comprises agricultural land. The other main land use in the Walpole Stations Area is existing electrical infrastructure, comprising the existing Walpole substation, the Rose and Crown Solar Farm and electricity transmission lines. Settlements within the Walpole Stations Area include Ingleborough, West Walton and Walton Highway.

4.4.6 The A47 is the only trunk road present within the Walpole Stations Area, located south of Walton Highway and connecting the A1101 south of Wisbech and the A17 west of King's Lynn. Multiple Public Rights of Way (PRoW) are present within the Walpole Stations Area of the Scoping Boundary, located in the vicinity of Walpole Marsh and Walpole Saint Peter. A Sustrans national on-road cycle route intersects the Scoping Boundary, between West Walton and Walpole Highway.

4.4.7 Multiple designated heritage assets are located within the Walpole Stations Area of the Scoping Boundary. These are primarily Grade II listed buildings, with a group of Grade II listed memorials adjacent to St Mary's Church. Two Grade I listed buildings are located within the Scoping Boundary in the Walpole Stations Area, which comprise *the Bell Tower* and *St Mary's Church,* located within West Walton.

4.4.8 Flood Zone 2 and Flood Zone 3 are across the entire Scoping Boundary in the Walpole Stations Area. Several minor drains and watercourses are located within the Scoping Boundary in the Walpole Stations Area, including Walpole West Drain. In addition, the River Nene is located immediately adjacent to the west of the Scoping Boundary.

4.4.9 The Walpole Stations Area lies within South Holland District Council, the Borough Council of King's Lynn and West Norfolk, Lincolnshire County Council and Norfolk County Council.

LCS Converter Station Area

4.4.10 The LCS Converter Station Area is located within Section 1: Landfalls to Bilsby of the Scoping Boundary and extends from a point east of Saleby to a point northeast of Bilsby. There are no major settlements located within the LCS Converter Station Area of the Scoping Boundary.

4.4.11 The LCS Converter Station Area of the Scoping Boundary overlaps with the A1111. There are no listed buildings within the LCS Converter Station Area, however there is a cluster to the south in Bilsby and to the west in Thoresthorpe, with the closest located approximately 270 m from the boundary of the LCS Converter Station Area. Ecological designations within 10 km of the LCS Converter Station Area include the Greater Wash SPA and Humber Estuary Ramsar. There is no priority habitat within the Area, however there is deciduous woodland near the north and south. There are small sections of Flood Zone 2 and 3 in the Area, which feature in the centre and the southeast of the LCS Converter Station Area. One main river, Wold Grift Drain, intersects the centre of the LCS Converter Station Area of the Scoping Boundary. The Viking Link underground cable crosses the LCS Converter Station Area of the Scoping Boundary in the north, between Saleby and Wold Grift Drain.

4.4.12 This area lies within East Lindsey District Council and Lincolnshire County Council authority areas.

Landfalls: Theddlethorpe

4.4.13 The Theddlethorpe landfall extends from MLWS (where it overlaps with the English Offshore Scheme, see **Volume 1, Part 3 Chapter 20: English Offshore Scheme**) across the intertidal zone to terminate at a TJB. The Scoping Boundary at the Theddlethorpe landfall largely comprises of sand dunes and a beach running north to south along the coastline and is located approximately 4.5 km north of Mablethorpe on the Lincolnshire coastline. The sand dunes and beach are designated ecological sites comprising of the Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC, the Greater Wash SPA, the Humber Estuary SPA, the Humber Estuary Ramsar site, the Saltfleetby – Theddlethorpe Dunes Site of Special Scientific Interest (SSSI) and the Lincolnshire Coronation Coast National Nature Reserve (NNR).

4.4.14 The land to the west of the Scoping Boundary largely comprises agricultural land, with the former Theddlethorpe Gas Terminal located at the south. The settlement of Theddlethorpe St Helen is located adjacent to the west.

4.4.15 There are no trunk roads, A-roads or B-roads in the Theddlethorpe landfall. However, the A1031, connecting to Grimsby and settlements along the Lincolnshire coastline to the north of the landfall, is adjacent to the west. Several PRoW are located to the west which link Crook Bank, Sea Lane and Brickyard Lane to each other and the beach.

4.4.16 Flood Zone 2 and Flood Zone 3 are present across the entire extent of the Scoping Boundary on the landward (west) side of the Environment Agency tidal flood defence sand dunes. Several notable drains are located within the Scoping Boundary including The Cut, Crook Bank Drain East, Crook Bank Drain East Branch, Crook Bank Drain West, Millfield Drain, Middle Drain, and Mardyke Drain, which flow into the North Sea.

4.4.17 The Theddlethorpe landfall lies within East Lindsey District Council and Lincolnshire County Council.

Landfalls: Anderby Creek

4.4.18 The Anderby Creek landfall extends from MLWS (where it overlaps with the English Offshore Scheme, see **Volume 1, Part 3 Chapter 20: English Offshore Scheme**) across the intertidal zone to terminate at a TJB. The Scoping Boundary at the Anderby Creek landfall largely comprises agricultural land, with a narrow area of sand dunes and

a beach to the east, and is located between Anderby Creek (approximately 100 m southeast of the Scoping Boundary), and Sandilands (approximately 1.5 km north of the Scoping Boundary). Settlements are present within the Scoping Boundary in this location, primarily located along Huttoft Bank. The beach is designated as part of the Greater Wash SPA and the sand dunes are identified as coastal sand dune priority habitat. The Sea Bank Clay Pits SSSI is located adjacent to the north of the Scoping Boundary west of Huttoft Bank. At the north of the Scoping Boundary is the National Trust's proposed Sandilands nature reserve, formerly Sandilands golf course.

4.4.19 There are no trunk roads, A-roads or B-roads in this area. However, Sea Lane, which is present in the Anderby Creek landfall, connects to the A52 connecting with Sutton on Sea to the north and Skegness to the south. Several PRoW are located to the centre and south of the of the Scoping Boundary connecting with Huttoft Bank and the beach. The England Coastal Path crosses the Scoping Boundary in the Anderby Creek landfall as it routes behind the sand dunes connecting Mablethorpe and Skegness. The South Wolds and Skegness National Cycle Network (NCN) local cycle route crosses the Scoping Boundary in the Anderby Creek landfall as it routes along Sea Lane, connecting the settlement of Huttoft with the beach and running along the England Coastal Path towards Sandilands.

4.4.20 Flood Zone 2 and Flood Zone 3 are present across the entire extent of the Scoping Boundary on the landward (west) side of the Environment Agency tidal flood defence sand dunes. Several notable drains are located within the Scoping Boundary including Knopsey Drain, Sea Bank Drain and North Outmarsh Drain which form a network of drains behind the sand dunes.

4.4.21 The Anderby Creek landfall lies within East Lindsey District Council and Lincolnshire County Council.

Section 1: Landfalls – Bilsby

4.4.22 The Scoping Boundary between the landfalls and Bilsby largely comprises agricultural land and is located between Theddlethorpe St Helen, Anderby Creek, Alford and Bilsby. The settlements within this section include Strubby, Beesby, Asserby, Maltby le Marsh, Saleby and Thoresthorpe. The settlement of Alford is located to the southwest of the Scoping Boundary.

4.4.23 Numerous A-roads and B-roads are present within the Scoping Boundary including the A1031 located west of Theddlethorpe St Helen, the A1104 which is located along the western edge of the Scoping Boundary leading to Alford, the A157 which crosses the Scoping Boundary at Maltby le Marsh, and the A1111 which connects Sutton-on-Sea to Bilsby. Several PRoW are located within the northeast, southeast and west, connecting settlements such as Theddlethorpe and Huttoft to the coast, alongside those associated with the settlements surrounding Alford. A NCN local route also crosses this section of the Scoping Boundary as it routes predominantly east-west along Sea Lane, Huttoft Road (passing through Huttoft) and Alford Road routeing towards Cumberworth.

4.4.24 Several clusters of designated heritage assets, comprising listed buildings, are located within the Scoping Boundary, mostly located at Maltby le Marsh, Huttoft, Saleby, and Thoresthorpe. Two Scheduled Monuments, a *Moated site 100m south of Stain Farm* is approximately 2.8 km west of Mablethorpe, and the *Churchyard cross, St Margaret's churchyard, Saleby* located within Saleby, are located adjacent to the Scoping Boundary.

4.4.25 Flood Zone 2 and Flood Zone 3 are present across most of the Scoping Boundary within the section. Those areas outside of Flood Zone 2 and Flood Zone 3 are primarily located in the immediate areas around settlements. Several notable watercourses are located this section of the Scoping Boundary including Wold Grift Drain, Boygrift Drain, and Anderby Main Drain.

4.4.26 This section lies within East Lindsey District Council and Lincolnshire County Council.

Section 2: Bilsby – Welton le Marsh

4.4.27 The Scoping Boundary between Bilsby and Welton le Marsh largely comprises agricultural land. The Lincolnshire Wolds lies adjacent to the west of the Scoping Boundary south of Willoughby. The settlements within this section include Thurlby, Willoughby, Sloothby, Orby and Welton le Marsh. The Willoughby Meadow SSSI is located adjacent to the Scoping Boundary approximately 500 m south of Willoughby.

4.4.28 Two trunk roads are located within this section of the Scoping Boundary, the B1449 and the B1196. The B1449 routes between Bilsby and Mumby, and the B1196 routes between Willoughby and Welton le Marsh. Several PRoW also route across the Scoping Boundary in this section, most notably connecting the settlements within and surrounding the Scoping Boundary. A NCN local route also crosses through the section from north to south, connecting Willoughby to Orby.

4.4.29 Designated heritage assets are scattered across the Scoping Boundary in this section. These comprise the Grade I listed building *Church of St Helen*, located east of Willoughby alongside scattered Grade II listed buildings south of Willoughby and north of Boothby. There are also two Scheduled Monuments located adjacent but specifically excluded from the Scoping Boundary within this section; *Butterbump round barrow cemetery,* is located within the centre of the section approximately 1.4 km north of Sloothby, and *Castle Hill: a motte castle 250m east of Hanby Hall Farm*, is located in the southwest of the section approximately 700 m northeast of Welton le Marsh.

4.4.30 Flood Zone 2 and Flood Zone 3 are present across most of the Scoping Boundary in this section to the east of Willoughby, Sloothby, Orby and Welton le Marsh. Several notable watercourses are located within this section of the Scoping Boundary including Wold Grift Drain, Boygrift Drain, and Anderby Main Drain.

4.4.31 This section lies within East Lindsey District Council and Lincolnshire County Council.

Section 3: Welton le Marsh – Little Steeping

4.4.32 The Scoping Boundary between Welton le Marsh and Little Steeping largely comprises agricultural land and passes through a small section of the Lincolnshire Wolds between the B1196 and A158 to the northwest of Gunby. Settlements within this section include Great Steeping, Little Steeping and Halton Holegate and Halton Fenside.

4.4.33 Two A-roads and two B-roads are located within this section of the boundary. The A-roads comprise the A1208 and A158, both located north of Gunby where the Scoping Boundary intersects with the Lincolnshire Wolds. The B-roads comprise the B1195, which crosses the Scoping Boundary connecting Spilsby and Irby in the Marsh, and the B1449 which routes south of Welton le Marsh to connect with the A1208 and A158. Several PRoW are also located in the section connecting Candlesby to Gunby and connecting Great Steeping to Firsby and Halton Holegate. One NCN local route also

intersects with the Scoping Boundary in the south of the section and passes through the centre of Little Steeping.

4.4.34 Designated heritage assets are scattered across the Scoping Boundary in this Section, comprising listed buildings, predominantly located within Great Steeping, Halton Holegate and Little Steeping. The Scoping Boundary borders Gunby Estate Hall and Gardens east of Candlesby, which is also associated with several Grade I, II and II* listed buildings. The *Churchyard cross, St Andrew's churchyard* Scheduled Monument and *Churchyard cross, Old Church* Scheduled Monument are located adjacent to the Scoping Boundary between Great Steeping and Little Steeping.

4.4.35 Flood Zone 2 and Flood Zone 3 are present across the Scoping Boundary at the south of this section, south of the B1195. Several notable watercourses are located within this section of the Scoping Boundary including Steeping River, East Fen Catchwater Drain and Lady Waths Beck.

4.4.36 This section lies within East Lindsey District Council and Lincolnshire County Council.

Section 4: Little Steeping – Sibsey Northlands

4.4.37 The Scoping Boundary between Little Steeping and Sibsey Northlands largely comprises agricultural land. Settlements within this section include New Leake, Eastville, Friskney Eaudike, Midville, Fen Side, Stickney, Sibsey Northlands, Sibsey Fen Side and Sibsey.

4.4.38 The only trunk roads within the Scoping Boundary are the A16, connecting Stickford and Sibsey, and the B1184 located east of Sibsey connecting the A52 and the B1192. In addition to the A16, the A52 is adjacent to the Scoping Boundary south of Friskney Eaudike. The Poacher Railway line, connecting Skegness and Boston, predominantly routes adjacent to the south of the Scoping Boundary in this section except where it is crossed immediately south of New Leake and to the east of Sibsey. A Sustrans Cycle Route overlaps with the Scoping Boundary which connects Halton Holegate, Little Steeping and Wainfleet all Saints. PRoW are also scattered across the Scoping Boundary in this area connecting Little Steeping to Halton Holgate and associated with the periphery of Stickney and Sibsey northlands in the south of this section.

4.4.39 Designated heritage assets are scattered across the Scoping Boundary in this section, comprising listed buildings. The listed buildings comprise one Grade II* listed building within Little Steeping itself (*The Cottage*) and multiple scattered Grade II listed buildings between Little Steeping and Sibsey Northlands which are generally associated with the settlements of New Leake, Midville, Fen Side and Stickney. One Grade I listed Building (*Sibsey Lodge*) is also located in the south of this section, west of Sibsey. The *Churchyard cross, St Margaret's churchyard* Scheduled Monument is located adjacent to the Scoping Boundary in Sibsey.

4.4.40 Flood Zone 2 and Flood Zone 3 are present the entire Scoping Boundary within this section except for the areas of settlement between Fenside and Stickney. Several notable watercourses are located within this section of the Scoping Boundary including Steeping River, East Fen Catchwater Drain, West Fen Catchwater Drain and Stone Bridge Drain.

4.4.41 The Triton Knoll Offshore Wind Farm underground HVDC cables also cut through this section of the boundary, east of New Leake.

4.4.42 This section lies within East Lindsey District Council, Boston Borough District Council and Lincolnshire County Council.

Section 5: Sibsey Northlands – Hubbert's Bridge

4.4.43 The Scoping Boundary between Sibsey Northlands and Hubbert's Bridge largely comprises agricultural land but also includes recreation facilities such as the Boston Aeroclub and Boston West Golf Club. Settlements within this section include Sibsey, Frithville, Gipsey Bridge, Frith Bank, Anton's Gowt, Langrick Bridge, Brothertoft, Great Fen, Wyberton Fen and Hubbert's Bridge.

4.4.44 Several trunk roads, comprising the A1121, the B1184, the B1183 and the B1192, are located within this section of the Scoping Boundary. The A1121 crosses the Scoping Boundary from west to east at Hubbert's Bridge connecting Boston and the A17 at Swineshead Bridge. The B1184 crosses the Scoping Boundary between Sibsey and Gipsey Bridge, connecting the A52 and the B1192. The B1183 crosses the Scoping Boundary north and south of Frithville, connecting Boston and the A155 at Ravensby. The B1192 crosses the Scoping Boundary between the River Witham and Hubbert's Bridge, connecting the A155 at Coningsby and Kirton. The Sustrans National Cycle Network Route 1, connecting Boston and Lincoln, crosses the Scoping Boundary along the River Witham, west of Boston. Multiple PRoW are also located within the Scoping Boundary, primarily connecting Boston to surrounding villages and following both the River Witham and South Forty Foot Drain west of Boston.

4.4.45 Designated heritage assets are scattered across this section of boundary including the Grade II Listed Buildings *Frith Bank Bridge*, *Church of St Gilbert*, and *Mile Stone East of Bakers Bridge*. The *Sibsey Trader Windmill* Scheduled Monument is located adjacent to the Scoping Boundary immediately west of Sibsey.

4.4.46 Flood Zone 2 and Flood Zone 3 are across the entire Scoping Boundary in this section. Several notable watercourses are located within this section of the Scoping Boundary including Stone Bridge Drain, River Witham and South Forty Foot Drain.

4.4.47 The Triton Knoll underground HVDC cables cross through the centre of this Section between Sibsey Northlands and Langrick.

4.4.48 This section lies within East Lindsey District Council, Boston Borough District Council and Lincolnshire County Council.

Section 6: Hubbert's Bridge – Moulton Seas End

4.4.49 The Scoping Boundary between Hubbert's Bridge and Moulton Seas End largely comprises agricultural land, alongside scattered recreational properties including campsites and caravan parks. Settlements within this section include Hubbert's Bridge, Kirton Holme, Kirton End, Wigtoft, Sutterton, Algarkirk, Fosdyke, Fosdyke Bridge and Moulton Marsh.

4.4.50 Several trunk roads, comprising three A-roads and four B-roads, are located within this section of the Scoping Boundary. The A52 crosses the Scoping Boundary south of Hubbert's Bridge, connecting Boston and Swineshead. The A16 crosses the Scoping Boundary south and east of Algarkirk, connecting Boston and Spalding. The A17 crosses the Scoping Boundary between Wigtoft and Moulton Marsh, connecting the A52 at Bicker Bar and King's Lynn. The B1192 crosses the Scoping Boundary between

Hubbert's Bridge and Kirton, connecting the A155 at Coningsby and Kirton. The B1391 crosses the Scoping Boundary west of Kirton End, connecting Wyberton and the A52 at Drayton. The B1397 crosses the Scoping Boundary north of Sutterton, connecting Boston and the A152 at Gosberton. The B1357 crosses the Scoping Boundary north of Moulton Seas End, connecting Moulton Marsh and the A151 at Moulton. It is also noted that Sustrans National Route 1 overlaps this section of the Scoping Boundary between Hubbert's Bridge and Moulton Seas End. The Macmillan Way crosses the Scoping Boundary in this section west of Fosdyke along the River Welland. Multiple PRoW are also included within the section associated with Sutterton, Algarkirk, the River Welland and Saracen's Head.

4.4.51 There are three Grade II listed buildings within this section of the Scoping Boundary, comprising *Milestone East of Bakers Bridge*, *Milestone near Junction with Fenhouses Drove* and *Milepost,* East of Waste Green Lane. The *Shrunken medieval village* Scheduled Monument is located adjacent to the Scoping Boundary at Algarkirk.

4.4.52 Flood Zone 2 and Flood Zone 3 are across the entire Scoping Boundary in this section. Several notable watercourses are located within this section of the Scoping Boundary including South Forty Foot Drain and River Welland.

4.4.53 This section lies within Boston Borough Council, South Holland District Council and Lincolnshire County Council.

Section 7: Moulton Seas End – Foul Anchor

4.4.54 The Scoping Boundary between Moulton Seas End and Foul Anchor largely comprises agricultural land. Settlements within this section include Saracen's Head, Moulton Marsh, Holbeach Clough, Holbeach, Fleet Hargate, Gedney, Fleet, Tydd St Mary, and Sutton Bridge.

4.4.55 Several trunk roads are located within this section of the Scoping Boundary. Large sections of the A17 are located within the Scoping Boundary in this section and follow its northern boundary. The A1101 also overlaps the Scoping Boundary within this section to the west of Sutton Bridge. With regards to B-roads, the B1357 and the B1515 overlap with this Section to the east of Holbeach and the B1390 overlaps the Scoping Boundary northwest of Tydd St Mary. This Section also overlaps with the Sustrans NCN Route 1 located between Holbeach and Tydd St Mary. Multiple PRoW intersect the Scoping Boundary in this location which connect to the settlements of Holbeach, Fleet Hargate, Gedney, Long Sutton and Sutton Bridge. Multiple designated heritage assets are located within this section of the Scoping Boundary. These primarily comprise Grade II listed buildings which are scattered throughout the section. Three Grade I listed buildings are also located within the Scoping Boundary, these comprise *the Bell Tower* and *Church of Mary Magdalen* within Fleet and *Church of St Mary Magdalene* within Gedney

4.4.56 Flood Zones 2 and 3 are present throughout the entire section of the Scoping Boundary. The River Nene and South Holland Main Drain are notable watercourses that overlap the Scoping Boundary to the east and south of Sutton Bridge, respectively.

4.4.57 This section lies within Boston Borough Council, South Holland District Council and Lincolnshire County Council.

Section 8: Foul Anchor – Walpole

4.4.58 The Scoping Boundary between Foul Anchor and Walpole largely comprises agricultural land; however, there is also a notable presence of existing electrical transmission and distribution infrastructure. Settlements within this section of the Scoping Boundary include Foul Anchor, Tydd Gote, West Walton, Walpole St Andrew and Walpole St Peter.

4.4.59 The section does not overlap with any A or B-roads, however it does intersect with minor roads throughout the whole length of the Scoping Boundary. There are several listed buildings located within this section of the Scoping Boundary associated with Ingleborough, West Walton and Walton Highway.

4.4.60 Flood Zones 2 and 3 are present throughout this section of the Scoping Boundary. To the north of Walpole Marsh, the Scoping Boundary overlaps with the River Nene. The southern extent of the Scoping Boundary also intersects with Walpole West Drain between the A47 and West Drove. Both the existing Walpole substation and the Rose and Crown Solar Farm lie within the Scoping Boundary, to the west of Walpole St Peter, and north of West Walton, respectively.

4.4.61 This section lies within South Holland District Council, Borough of King's Lynn and West Norfolk, Lincolnshire County Council and Norfolk County Council. It also lies within approximately 40 m of the Fenland District Council and Cambridgeshire County Council local authority boundaries.

4.5 Development proposals

4.5.1 The specific elements and planned works at each location of the English Onshore Scheme are described in the following sections.

4.5.2 All dimensions in the sections below are approximate.

Walpole Converter Stations

4.5.3 The existing electricity networks in Great Britain operate using AC technology. To transmit electricity using DC technology, converter stations are required at each end of the electricity transmission link. The English Onshore Scheme would utilise self-computed voltage source conversion (VSC) technology, which allows for greater control over reactive and active power and also allows for a more compact converter station layout reducing the operational land take required.

Physical description of the Walpole converter stations

4.5.4 The converter stations contain specialist electrical equipment which converts electricity from AC to DC (or vice versa depending on the direction of electricity transmission). It would comprise specialist electrical equipment, some of which must be located indoors in buildings up to 26 m tall, while other elements could be located outdoors or in smaller buildings.

4.5.5 Two new converter stations would be required at Walpole in proximity to the existing Walpole substation and new Walpole substation (which would be a new connection point on the network for the Walpole converter stations).

4.5.6 The platform dimension for each converter station would be approximately 6.7 ha, excluding access, drainage, landscaping and earthworks.

4.5.7 Each converter station would comprise the following components within a secure fenced compound. The parameters, as set out below, set the maximum parameters within which the detailed design will be developed:

- **DC Hall** - the DC cables terminate here. The switch hall also contains DC switchgear to connect to power electronics. This equipment would be enclosed in a building up to 26 m height (not including aerials and lightning protection that may be required for safety).
- **Valve Halls and AC Inductors** – contain high voltage power electronics equipment that converts electricity from DC to AC and vice-versa. This equipment must be located indoors in buildings up to 26 m height within a controlled environment.
- **Control Building** – contains control panels and associated operator stations, protection and communication equipment, offices and welfare facilities and other auxiliary systems all located within an enclosed building up to 15 m high.
- **Transformer bays** – these change the AC voltage to an appropriate level for transmission via the AC system/or prior to conversion to DC. The transformers are normally sited outdoors and separated by concrete fire protection walls. Typical dimensions are 15 m long by 15 m wide by 16 m high. Cooling fans are also provided on transformers. Noise enclosures can be fitted around the transformers if required.
- **AC Switch gear and filters ("switch yard")** – connects the converter station to the AC transmission system. It includes a range of electrical equipment including harmonic filtration and reactive compensation equipment, circuit breakers, transformers, busbars and insulators. The main function is to allow the effective integration of the DC system into the AC system. Commonly the AC switchyard and associated equipment is located outdoors although this equipment can be enclosed in a building or series of buildings, and would be the subject of detailed design.
- **Diesel Backup Generator** – the converter station requires its own power typically provided at 11 kV, the diesel back-up generator would be used to provide back-up electricity supply in the event of a failure of the low voltage electricity supply.
- **Spares Building** – a building to house spare parts and components; this would be supplemented by hardstanding areas provided for storage of a spare transformer and spare cable drums.

4.5.8 These components could be arranged differently subject to the ongoing design process taking into account engineering, environmental and other requirements.

4.5.9 Each converter station (one for EGL 3 and one for EGL 4) with outdoor Air Insulated (HVAC) Switchgear (AIS) would extend to approximately 290 m by 230 m (approximately 6.7 ha). It should be noted that this excludes related development including permanent access, peripheral landscaping, drainage and other related works.

4.5.10 The converter station site would be within a fenced compound with restricted access. A palisade fence would be erected around the site, this would be established at the start of construction and retained for operation. The site would also be monitored by CCTV and security gates would be in place for restricted/controlled access.

4.5.11 Lighting of the converter station during operation would be required for safe movement around the compound. This would be minimised wherever possible and would be directional to prevent/reduce light spill.

Access to the Walpole converter stations

4.5.12 Access to each of the Walpole converter stations would be required however the location and extent of permanent access is dependent on the final siting of the infrastructure.

Construction of the Walpole converter stations

4.5.13 Additional land would also be required to facilitate the construction of the converter stations. Each converter station construction compound would be approximately 200 m by 200 m (4 ha).

4.5.14 The exact phasing of some activities would depend on the Construction Contractor and detailed design, but the main construction activities of the Walpole converter stations would typically include:

- preliminary works, including diversion of distribution network overhead lines;
- access road construction;
- site establishment;
- earthworks;
- civil engineering works;
- building works;
- cable installation;
- provision/ installation of permanent services;
- mechanical and electrical works;
- commissioning; and
- site reinstatement and landscape works.

4.5.15 A summary of the key characteristics of each of the Walpole converter stations are outlined in **Table 4-1.**

Table 4-1: Walpole Converter Stations: Summary of Key Characteristics

Factor	Details
Technology	525 kV VSC (voltage source conversion, self-commutated).
Indicative converter station platform footprint	6.7 ha
Maximum height	26 m (excluding lightning protection and aerials)

Factor	Details
Construction compounds	One construction compound for each converter station of approximately 200 m by 200 m

LCS Converter Station and DCSS

4.5.16 Developed as part of the Grimsby to Walpole Project (Ref 4.2); suitable locations for the siting of two 400 kV LCS (LCS-A and LCS-B), were identified in East Lindsey. As described in **Paragraph 3.5.39** there is the potential for a three-ended connection (as part of EGL 4) to the LCS, in order to increase capacity without the need for additional circuits in the near term. To construct a three-ended connection to the LCS, a DCSS and an additional converter station would be required in the vicinity of the LCS located north/northeast of Alford in East Lindsey. Further detailed studies are required to confirm the requirement for the three-ended connection.

Physical Description of the LCS converter station and Direct Current Switching Station (DCSS)

4.5.17 To enable a three-ended connection as part of the EGL 4 Project, a new converter station (the LCS converter station) and DCSS would be required in proximity to one of the two LCS. Engineering solutions are available to co-locate the new LCS converter station and the DCSS in the same, connected, or immediately adjacent structures. For the purposes of the current stage of the English Onshore Scheme it has been assumed that the new LCS converter station and DCSS would be in immediately adjacent structures. It has assumed that that the LCS converter station with outdoor (AIS) HVAC switchgear and the DCSS could extend to approximately 380 m by 230 m (approximately 8.8 ha). It should be noted that this excludes related development including permanent access would be needed to the new converter station and DCSS, together with peripheral landscaping, drainage, and other related works.

4.5.18 The DCSS would be connected to the LCS converter station by DC cables and the LCS converter station to one of the two LCS by HVAC cables.

Access to the LCS converter station and DCSS

4.5.19 Access to each of the LCS converter station and DCSS would be required, however the location and extent of permanent access is dependent on the final siting of the infrastructure.

Construction of the LCS converter station and DCSS

4.5.20 Additional land would also be required to facilitate the construction of LCS converter station and DCSS. Details of the key characteristics are included in **Table 4-2**. The area which would be required for the converter station construction compound is anticipated to be approximately 200 m by 200 m (4 ha).

4.5.21 The exact phasing of some activities would depend on the Construction Contractor and detailed design, but the main construction activities of the LCS converter station and DCSS would typically include:

- preliminary works, including diversion of distribution network overhead lines;
- access road construction;

- site establishment;
- earthworks;
- civil engineering works;
- building works;
- cable installation;
- provision/ installation of permanent services;
- mechanical and electrical works;
- commissioning; and
- site reinstatement and landscape works.

Table 4-2: LCS Converter Station and DCSS: Summary of Key Characteristics

Factor	Details
Technology	525 kV VSC (voltage source conversion, self-commutated).
Indicative converter station platform and DCSS platform footprint	8.8 ha
Maximum height	26 m (excluding lightning protection and aerials)
Construction compounds	One construction compound for the converter station and DCSS of approximately 200 m by 200 m

Landfall

Physical description of the landfalls

4.5.22 The landfall is the interface between the English Onshore Scheme and the English Offshore Scheme (also see **Volume 1, Part 3 Chapter 20: English Offshore Scheme**). This is the location where subsea cables (which are of a great diameter due to increased protection), would connect to the onshore underground cables at a buried TJB. More specifically, the landfall is considered to extend from MLWS (where it overlaps with the Offshore components) across the intertidal zone to terminate at a buried TJB located a short distance inland. A TJB is a permanent underground chamber constructed of reinforced concrete that houses the cable joints and a fibre chamber/link pit. A single TJB typically comprises an area of 15 m by 4 m (60 sqm); a typical combined TJB has approximately the same dimensions. Either two single TJBs or a combined TJB would be required for the English Onshore Scheme. This would be confirmed at the detailed design stage.

4.5.23 The landfall would be located at either Theddlethorpe or Anderby Creek, East Lindsey.

Construction and Installation at the landfall

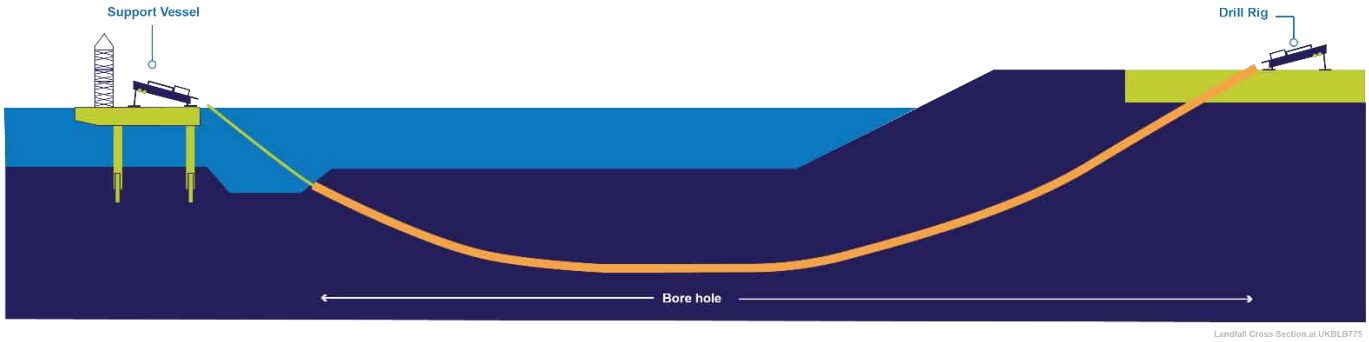
4.5.24 A larger area would be required temporarily during construction and installation of the TJB to accommodate temporary construction equipment and storage areas.

4.5.25 A temporary construction compound, which would extend approximately 150 m by 150 m (2.25 ha), would be required to construct the landfall and the TJB. The temporary compound would contain all necessary plant and equipment plus parking and welfare facilities required. Once installation has been completed, the land would be reinstated to pre-existing conditions; the only infrastructure visible on the surface (on otherwise fully reinstated land, see **Figure 4.1: Triton Knoll TJB Following Reinstatement** as an example) would be the cover of the link box pit.

Figure 4.1: Triton Knoll TJB Following Reinstatement

4.5.26 Installation of the DC cables at the landfall between Onshore and Offshore environments would be achieved utilising trenchless methods where possible to minimise disruption and avoid direct impacts to the intertidal zone. The exact trenchless method is subject to further detailed design considering the result of ground investigation; however, it is considered likely to be by a technique referred to as Horizontal Directional Drilling (HDD). HDD is a construction technique typically utilised in utilities construction whereby a tunnel is drilled under a constraint (such as a watercourse, environmentally sensitive area or other infrastructure) and a pipeline or cable is pulled through the drilled underground tunnel. At the landfall, HDD would be utilised to install a duct for each subsea cable between the TJB and the breakout point in the Offshore environment beyond the MLWS. The breakout point from the HDD is subject to the appointed Construction Contractor(s) final design and dependent on the ground conditions and depth of the cable needed to be achieved to ensure suitable protection, however HDD's can typically be up to 800 to 1,200 m in length, and the maximum known DC cable landfall HDD in the UK is 1.6 km. The subsea cables would be pulled through the installed ducts and joined to the underground DC cables at the TJB. An indicative cross section of the HDD at the landfall is provided in **Figure 4.2: Indicative Landfall HDD Cross Section**.

Figure 4.2: Indicative Landfall HDD Cross Section



4.5.27 Access to the landfall is likely to be via a temporary access track from the existing road network. Construction activities within the landfall would include compound construction, site mobilisation, site operations, materials deliveries, cable pull-in, site demobilisation and site reinstatement. Anticipated construction vehicles would include heavy goods vehicles (HGVs), light goods vehicles (LGVs), vans and cars. Abnormal Indivisible Load (AIL) movements would be required to allow cable delivery to the landfall.

4.5.28 A summary of the key characteristics of the landfall are outlined in **Table 4-3**.

Table 4-3: Landfall: Summary of Key Characteristics

Factor	Details
Location	Theddlethorpe or Anderby Creek, in East Lindsey, Lincolnshire
Working Area	Approximately 150 m by 150 m
Installation Approach	Horizontal Directional Drill (HDD)
HDD Length	Maximum 1.6 km
Operational Footprint	TJB is typically a buried concrete chamber. No above ground infrastructure. TJB dimensions are approximately 15 m by 4 m (60 sqm) per HVDC link. Two TJBs would require 120 sqm.

Underground HVDC Cables

4.5.29 The term underground HVDC cable route is used throughout this Scoping Report and refers to the underground HVDC cables, the trench (or installation area) and associated temporary working areas which would be required for cable installation as covered below. For ease of describing the route, and for the identification and assessment of potentially significant impacts, the Scoping Boundary has been split into eight Route Sections, which are:

- Section 1: Landfalls – Bilsby.
- Section 2: Bilsby – Weston le Marsh.
- Section 3: Weston le Marsh – Little Steeping.
- Section 4: Little Steeping – Sibsey Northlands.

- Section 5: Sibsey Northlands – Hubbert's Bridge.
- Section 6: Hubbert's Bridge – Moulton Seas End.
- Section 7: Mouton Seas End – Foul Anchor.
- Section 8: Foul Anchor – Walpole.

4.5.30 The exact configuration of the underground HVDC cables route depends on a number of factors including the constraints (such as crossings of major rivers, roads, utilities and railways) which are present, prevailing ground conditions, the length of each cable section, suitability of jointing positions and the number of bends and topography of the route.

4.5.31 **Section 4.4** above provides a high-level description of the Scoping Boundary for each of the Route Sections. The following sections provide a high-level description of the design, construction and operation of the underground HVDC cables (described in this Scoping document as 'DC cables').

Underground HVDC Cable Route Overview

4.5.32 At the landfall, where the Onshore and Offshore components of EGL 3 and EGL 4 overlap, the DC cables continue from offshore to onshore environment. The English Onshore Schemes DC cables would begin at MLWS and extend across the intertidal zones to connect into a buried TJB (where the submarine and Onshore DC cables connect). From the TJB, the DC cables would route towards the two new converter stations at Walpole.

4.5.33 To form the three-ended connection, the DC cables would firstly route to the DCSS. At the DCSS the DC cables for EGL 4 would connect and continue onto the LCS converter station. Both sets of DC cables would then continue south to connect at the Walpole converter stations.

Physical description of the DC Cables

4.5.34 The English Onshore Scheme would comprise two sets of two DC cables (and a Distributed Temperature Sensing (DTS) carrier tube and fibre optic cables for performance monitoring). Each DC cable is typically 15 cm in diameter.

4.5.35 The English Onshore Scheme would require the construction of approximately 100 km of DC cables, for each of EGL 3 and EGL 4, connecting from either the Theddlethorpe or Anderby Creek landfall to the Walpole converter stations. The exact configuration of the DC cables is subject to detailed design following appointment of a Construction Contractor; however, the general characteristics below have informed this Scoping Report.

4.5.36 The DC cables would have a permanent easement. The exact width of the permanent easement is still to be determined, this would be established during the detailed design stage of the Projects.

4.5.37 The DC cables would be installed in sections, typically every 800 m to 1.5 km. These sections would be connected at buried cable joint bays. The number, location and dimensions of cable joint bays required would be determined through consultation feedback, information from surveys and ongoing design studies.

4.5.38 There would be no permanent above ground infrastructure required along the new DC cables route except for small marker posts. These may be installed at field boundaries, crossings, and other locations as appropriate to highlight the presence of the DC cables to landowners, asset owners and those undertaking works within the vicinity.

Construction and Installation

4.5.39 The typical DC construction swathe required for the construction and installation of the DC cables, including for access routes, soil storage and drainage, is approximately 70 m in total. This is described in this Scoping Report as the working width. The working width is demarcated by a post and rail fence and would typically comprise:

- storage areas for topsoil and subsoil stripped from the working width;
- drainage measures;
- temporary haul road, typically 7 m in width, for the movement of installation traffic;
- cable installation trench of a minimum depth of 900 mm (to the cable protective tiles);
- storage areas for excavated material; and
- other mitigation measures as necessary.

4.5.40 In addition to the working width, cable construction and installation would require temporary construction facilities to be established at various locations along the route. These may result in a wider route corridor in some sections or require temporary land take ‘off” the DC cable route corridor. This includes temporary access to the working width, drainage and temporary compounds for storage, lay-down and site offices.

4.5.41 There are several different installation methods available for the installation of DC cables. The exact methods for cable installation would depend on the final cable route and constraints which are present. Typically, cable installation would involve the following activities:

- **Open cut/direct buried**: this is where a trench is excavated, and the underground cables laid directly into a single trench typically 1.5 m wide unless ground conditions or constraints dictate otherwise (for example due to other utilities or field drainage). The trench would then be backfilled using a combination of excavated soils and thermally suitable material (such as Cement Bound Sand (CBS)) and the land reinstated. Further information regarding the measures that would be undertaken to reinstate land and soils is provided in **Part 2, Chapter 11: Agriculture and Soils**. Two trenches are required for the English Onshore Scheme, one for the EGL 3 and one for the EGL 4.
- **Open cut/ducted** - This installation method is largely the same as per the process for open cut/direct buried. The main difference is that ducts are laid in the trench and the underground cables are then pulled through the ducts. This installation method allows for the ducts to be laid and the majority of the trench reinstated without the underground cables being present. Cable joint bays would need to remain open as they would be utilised to pull the underground cable through the pre-installed ducts and join the sections of underground cables together. Following underground cable installation, the land would be reinstated.

- **Trenchless methods** such as HDD or microtunnelling/pipejacking: these are used where specific features are encountered, such as main rivers, major roads, railway lines, flood defences or other significant infrastructure, need to be crossed. Where HDD is not technically viable then a tunnelled (microtunnelling/pipejacking) solution can be considered. In determining the most appropriate trenchless technique for installing DC cables, NGET need to ensure the electrical performance of the DC cables are not compromised.
    - *HDD* involves the use of a drill to bore a route below the ground through which ducts would be pulled and cables installed;
    - *Microtunnelling/Pipejacking* is a technique for installing underground ducts and uses hydraulic jacks to push specially designed pipes through the ground behind a shield at the same time as excavation is taking place within the shield, cables are then installed in the pipes; and
- **Cable jointing**: cable joint bays are required between each cable section to join them together, and cables are typically installed in sections approximately 800 m to 1.5 km long. The number, location and dimensions of cable joint bays required would depend on the cable route and constraints present which would be determined through consultation feedback, information from surveys and ongoing design studies. These would be formed by building a concrete floor (or similar) in the base of the trenches approximately 12 m by 5 m. Cable joint bays must be clean and dry so temporary covers would be erected at jointing locations. Due to the precise nature of engineering employed, cable joint bays could remain open for several weeks to allow for trench and joint bay excavation, cable pulling, jointing and reinstatement.

4.5.42 Where conditions allow DC cables are typically installed using open cut methods. Open cut methods are generally preferred as they enable DC cables to be installed at more technically efficient depths. Open cut methods are also generally more economical and often require a smaller construction footprint than trenchless methods. Where technically feasible, and unless other environmental and infrastructure features and considerations determine otherwise, all underground cable installation would be by open-cut method.

4.5.43 The minimum burial depth of the DC cables is typically 900 mm to the cable protective tiles. Where constraints dictate, such as the presence of Best and Most Versatile (BMV) agricultural land[8], depths of installation may be deeper, typically 1.2 m to the cable warning tape. This would be determined through feedback from consultation, information from surveys, stakeholders, landowners and ongoing design studies.

4.5.44 Where specific environmental or infrastructure features preclude the use of open cut methods, use of trenchless methods such as HDD would be used. The depth of installation would be deeper at locations where trenchless installation methods are used.

8 This is in accordance with Energy Networks Association Guidance “Cable Laying on Agricultural Land” Ref: G57:Issue2:2019 (“ENA Guidance”). Available at: https://www.ena-eng.org/ena-docs/index?Action=ViewDetail&EID=99885.

4.5.45 A summary of the key characteristics of the underground DC cable route are outlined in **Table 4-4**.

Table 4-4: Underground DC Cables Route: Summary of Key Characteristics

Factor	Details
Operating voltage	525 kV
Indicative Length of Route	Approximately 100 km
Cable number	Four DC cables would be installed, two DC cables for EGL 3 and two DC cables for EGL 4. A DTS and fibre optic cable would be installed with the DC cables for monitoring
Indicative cable dimensions	Each DC cable is approximately 15 cm in diameter.
Working width	Approximately 70 m. Working width includes provision for the cable trench, cable joint bays, soil storage, materials and equipment laydown, and temporary haul road.
Number of trenches	Two trenches, one containing the two DC cables, a DTS and one fibre optic cable for EGL 3 and one containing the two DC cables, a DTS and one fibre optic cable for EGL 4
Indicative trench width and depth	Approximately 1.5 m wide (subject to local ground conditions and obstacles). The approximate depth coverage would be 900 mm to the cable protective tiles. The depth of installation would be deeper at locations where trenchless methods e.g. HDD, are required.
Number of cable joint bays	Required approximately every 800 m to 1.5 km
Construction compounds for underground cable installation	Construction compounds and other working areas for installation of DC cables, such as HDD set up locations (in the case of trenchless methods), would be required at various locations along the length of route.
Permanent above ground infrastructure	Cable markers may be installed at field boundaries, crossings, and other locations as appropriate to highlight the presence of the DC cables to landowners, asset owners and those undertaking works within the vicinity.

Underground HVAC Cables

4.5.46 Where reference is made to the underground HVAC cable route in this Scoping Report, this refers to the underground HVAC cables, the trench (or installation area) and associated temporary working areas which would be required for cable installation (see **Paragraph 4.5.41**) as covered below, unless specifically stated otherwise.

4.5.47 The underground HVAC cable route would connect the new Walpole converter stations to the new Walpole substation. Underground HVAC cables would also be required to connect the new LCS converter station to the LCS.

4.5.48 The exact configuration of the underground HVAC cable route depends on a number of factors including the constraints which are present (such as crossings of major rivers, roads, utilities and railways), prevailing ground conditions, the length of each cable section, suitability of jointing positions and the number of bends and topography of the route.

4.5.49 The following sections provide a high-level description of the design, construction and operation of the underground HVAC cables (described in this Scoping Report as 'AC cables').

Physical description of the Underground AC Cables

4.5.50 Each connection from the new Walpole converter stations to the new Walpole substation would require two sets of three AC cables (i.e. a total of six AC cables from the EGL 3 Walpole converter station and a total of six AC cables from the EGL 4 Walpole converter station). One set of three AC cables would also be required to connect from the LCS converter station to a LCS substation, should a three-ended link be required. The AC cables would include a DTS carrier tube and fibre optic cables for performance monitoring. Each AC cable is typically 15 cm in diameter.

4.5.51 The English Onshore Scheme would require the construction of approximately 5 km of AC Cables, for each of EGL 3 and EGL 4, between the Walpole converter stations and the new Walpole substation and the LCS converter station and LCS substation. The exact configuration of the AC cables is subject to detailed design following appointment of a Construction Contractor; however, the general characteristics below have informed this Scoping Report.

4.5.52 The AC cables would have a permanent easement. The exact width of the permanent easement is still to be determined.

4.5.53 The AC cables would be installed in sections, typically every 800 m to 1.5 km. These sections would be connected at buried cable joint bays. The number, location and dimensions of cable joint bays required would be determined through consultation feedback, information from surveys and ongoing design studies.

4.5.54 There would be no above ground infrastructure required along the new AC cables route except for small marker posts or link pillars. Underground link boxes could also be used instead of link pillars at buried cable joint bays. The marker posts may be installed at field boundaries, crossings, and other locations as appropriate to highlight the presence of the AC cables to landowners, asset owners and those undertaking works within the vicinity. Link pillars would be required at buried cable joint bays, where the AC cable sections would be joined. Link pillars are typically 1 m by 1.5 m and are at a height of 1.5 m and are typically enclosed within a timber fence typically at a height of 1.5 m.

Construction and Installation

4.5.55 The typical AC construction swathe required for the construction and installation of the AC cables, including for access routes, soil storage and drainage, is approximately 130 m in total where open-cut installation methods are used and approximately 140 m in

total where trenchless installation methods are used. This is described in this Scoping Report as the working width. The working width is demarcated by a post and rail fence and would typically comprise:

- storage areas for topsoil and subsoil stripped from the working width;
- drainage measures;
- temporary haul road, typically 7 m in width, for the movement of installation traffic;
- cable installation trench of a minimum depth of 900 mm (to the cable protective tiles);
- storage areas for excavated material; and
- other mitigation measures as necessary.

4.5.56 In addition to the working width, cable construction and installation would require temporary construction facilities to be established at various locations along the route. These may result in a wider route corridor in some sections or require temporary land take 'off' the AC cable route corridor. This includes temporary access to the working width, drainage and temporary compounds for storage, lay-down and site offices.

4.5.57 As with DC cables, there are several different installation methods available for the installation of AC cables. These methods are the open-cut and trenchless methods described in **Paragraph 4.5.41** with AC cables installed in sections and connected at buried cable joint bays. The number of sections and the number, location and dimensions of cable joint bays required would be determined through consultation feedback, information from surveys and ongoing design studies.

4.5.58 As described in **Paragraph 4.5.42**, where technically feasible, and unless other environmental and infrastructure features and considerations determine otherwise, all underground cable installation would be by open-cut method. Where specific environmental or infrastructure features preclude the use of open cut methods, use of trenchless methods such as HDD would be used.

4.5.59 Where open-cut installation methods are used for the AC cables, two trenches would be required for the EGL 3 Project AC Cables and two trenches would be required for the EGL 4 Project AC cables. Each trench would contain two sets of three AC cables and (subject to cable system design) for the AC cables would be approximately 3 m wide.

4.5.60 The minimum depth of cover for the AC cables is typically 900 mm to the cable protective tiles. Where constraints dictate, such as BMV agricultural land, depths of installation may be deeper, typically 1.2 m to the cable warning tape. This would be determined through feedback from consultation, information from surveys and ongoing design studies.

4.5.61 Where specific environmental or infrastructure features preclude the use of open cut methods, use of trenchless methods such as HDD would be used. The depth of installation would be deeper at locations where trenchless installation methods are used.

4.5.62 A summary of the key characteristics of the underground AC cable route are outlined in **Table 4-5**.

Table 4-5: Underground AC Cables Route: Summary of Key Characteristics

Factor	Details
Operating voltage	400 kV
Indicative Length of Route	Approximately 5 km each for EGL 3 and EGL 4.
Cable number	Twelve cables in total i.e. two sets of three (totalling six AC cables) for EGL 3 and two sets of three (totalling six AC cables) for EGL 4.
Indicative cable dimensions	Each AC cable is approximately 15 cm in diameter.
Working width	Approximately 130 m where open-cut methods are used and 140 m where trenchless methods are used. Working width includes provision for the cable trench, cable joint bays, soil storage, materials and equipment laydown, and temporary haul road.
Number of trenches	Two trenches would be required for the EGL 3 Project AC Cables and two trenches would be required for the EGL 4 Project AC cables.
Indicative trench width and depth	Approximately 3 m wide (subject to local ground conditions and obstacles). The approximate depth coverage would be 900 mm to the cable protective tiles. The depth of installation would be deeper at locations where trenchless methods e.g. HDD, are required.
Number of cable joint bays	Required approximately every 800 m to 1.5 km.
Construction compounds for underground cable installation	Construction compounds and other working areas for installation of AC cables, such as HDD set up locations (in the case of trenchless methods), would be required at various locations along the length of route.
Permanent above ground infrastructure	Cable markers may be installed at field boundaries, crossings, and other locations as appropriate to highlight the presence of the AC cables to landowners, asset owners and those undertaking works within the vicinity. Link pillars at buried cable joint bays which are typically 1 m by 1.5 m and are at a height of 1.5 m. Link pillars are typically enclosed within a timber fence typically at a height of 1.5 m.

New 400 kV Walpole Substation

4.5.63 A proposal for a new Walpole substation (also known as Walpole B substation) is currently being developed by NGET. The new Walpole substation is needed to connect future transmission and generation projects requiring connections which include:

- EGL 3;
- EGL 4;

- the Grimsby to Walpole Project; and
- Customer Connection projects.

4.5.64 As a key connection point for both the English Onshore Scheme and the Grimsby to Walpole Project, the new Walpole substation would be developed as part of one of these projects, for the purpose of EIA and seeking DCOs it is currently included as part of both projects.

4.5.65 The Grimsby to Walpole Project's proposed new 400 kV overhead line, will require a separate consent to bring the overhead line to the new Walpole substation. As such this component does not form part of the English Onshore Scheme. However, as the new Walpole substation would facilitate the connection of this project (and its associated infrastructure) a coordinated approach has been adopted from the outset.

Types of substations

4.5.66 There are two main types of substations; one equipped with AIS and the other with the other with Gas Insulated Switchgear (GIS). HVAC installations can use either AIS or GIS technology. AIS switchgear relies largely on open air to provide insulation between high voltage conductions and earth, and from conductor to conductor. Since air is a relatively poor insulator, large clearances are necessary to avoid insulation failure. Hence equipment must be widely spaced which can require large clearance areas to ensure reliable operation and maintain safety. This takes up a larger area of land compared to GIS installations. AIS substations are typically lower cost than equivalent GIS installations and can involve less construction time, with fewer components required, and are easier to maintain. However, they require a larger area of land and, as they are exposed to the elements, they may not be suitable for certain environments such as coastal areas.

4.5.67 The high voltage conductors in a GIS substation are enclosed in tubes filled with compressed gas, which is a superior insulator to air. This allows operational clearances to be significantly reduced and since the conductors are enclosed, there is no requirement to add additional safety clearances. GIS substations therefore typically require less space, and this may have a reduced visual impact as a result. However, they tend to be more costly, require specialised operation and maintenance, have longer outage repair times and have typically required the use of sulphur hexafluoride (SF_6) for insulation - a greenhouse gas. It is noted that alternative insulating gases with much lower global warming impact are being introduced and are expected to replace SF_6 over the next few years.

4.5.68 As noted within NPS EN-5 (Paragraph 2.9.61), it should be considered carefully whether proposed development could be reconceived during the design phase of the process to avoid the use of SF_6-reliant assets. NGET policy generally precludes the future use of SF_6 based insulation gases due to the negative environmental impacts.

4.5.69 AIS installations are preferred due to lower costs and the reduced operational maintainability of the technology. However, due to the proximity of the coast at some of the potential converter station and substation sites, there may be greater justification for using gas insulated equipment due to the accelerated corrosion of air insulated equipment in coastal environments. There may also be additional benefits in using gas insulated technology as these generally require less land take and in some instances may be less visually intrusive to the surrounding landscape. Further investigations into

the levels of salt pollution and into the historical performance of AIS equipment in the area would be required to confirm use of AIS or GIS. These investigations would confirm whether GIS equipment would be justified. SF_6-free alternatives are also currently in development and may be type-registered by the time the Project enters the construction phase; this would significantly reduce the environmental risk of GIS equipment although not to a level comparable to AIS as current alternatives use fluorinated gases which present another set of environmental challenges. The use of gas insulated solutions is therefore being monitored and has not been discounted completely at this point. However, based on NGET policy, an air insulated solution is currently considered the preferred option.

4.5.70 For the purposes of the current stage of the Project and to inform the EIA Scoping, the use of AIS substations is anticipated. As part of the final design should no SF_6-free alternatives be commercially available, and a SF_6 GIS solution be identified as preferred, the Project would include information on the potential greenhouse gas emissions from use of the GIS solution, emissions monitoring and control measures, and the costs of implementing alternative solutions in line with NPS EN-5.

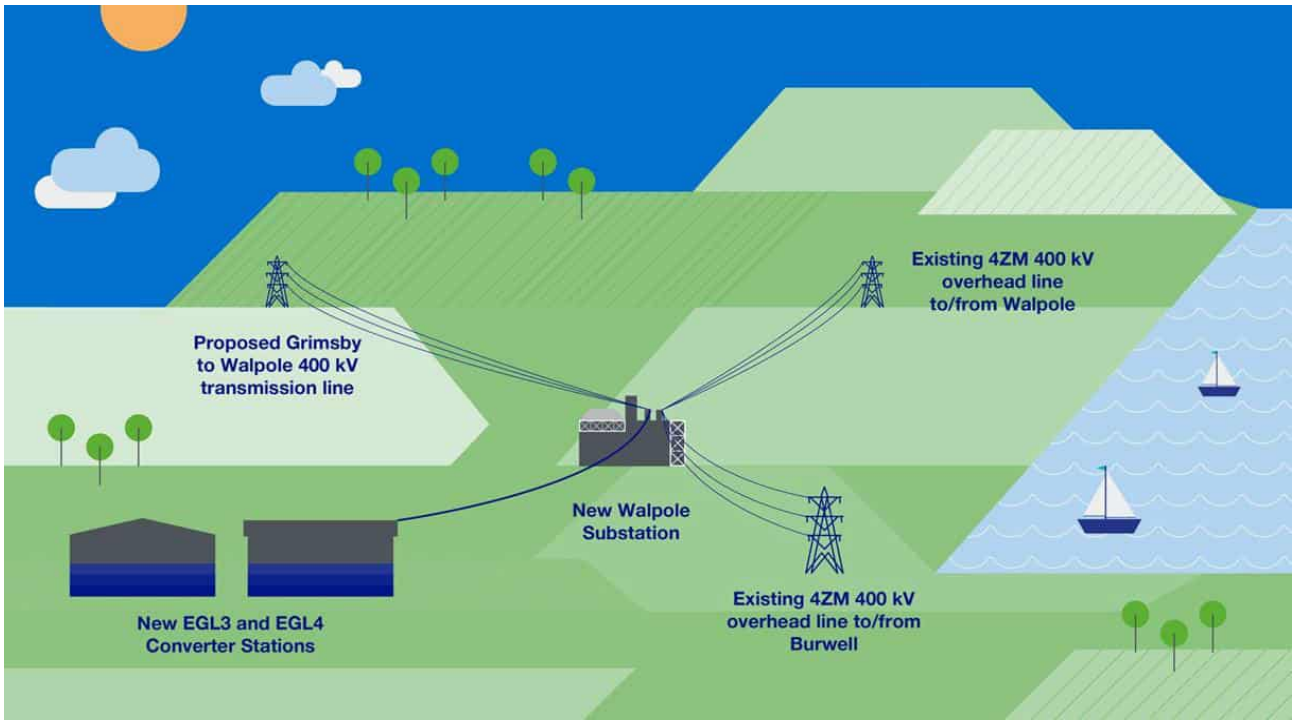
Physical description of the new Walpole substation

4.5.71 It is anticipated that a new AIS Walpole substation could extend up to 800 m by 200 m (approximately 16 ha) and would be of a similar height to the existing Walpole substation. The new Walpole substation would contain the necessary transmission equipment. It would also house switchgear and controls, as well as welfare facilities for operational staff. It should be noted that this excludes related development including permanent access would be needed to the new Walpole substation, together with peripheral landscaping, drainage, and other related works.

4.5.72 The new Walpole substation would connect to the existing 400 kV 4ZM transmission line that runs north from Burwell towards the existing Walpole substation. Works to sections of the existing 400 kV overhead lines may also be required to facilitate construction of the English Onshore Scheme. The extent of these works has yet to be determined.

4.5.73 The proposed connection arrangement at Walpole is shown in **Figure 4.3: Proposed connection arrangement at Walpole.**

Figure 4.3: Proposed connection arrangement at Walpole



4.5.74 The new Walpole substation would be within a fenced compound with restricted access. It would be monitored by CCTV and security gates would be in place for restricted/controlled access. Sensory lighting of the new Walpole substation during operation would be required for safe movement around the compound. This would be minimised wherever possible and would be directional to prevent/reduce light spill.

Access to the new Walpole substation

4.5.75 Access to the Walpole substation would be required however the location and extent of permanent access is dependent on the final siting of the infrastructure.

Construction of the new Walpole substation

4.5.76 Additional land would also be required to facilitate the construction of the new Walpole substation. Details of the key characteristics of the Walpole Substation are provided in **Table 4-6**. Construction activities would begin with the preparation and installation of construction compounds. The location of the construction compounds for the Walpole Substation will be determined through the development of the English Onshore Scheme and will be presented in the ES.

4.5.77 . The exact phasing of some activities would depend on the Construction Contractor and detailed design, but the main construction activities of the Walpole substation would typically include:

- preliminary works, including diversion of distribution network overhead lines;
- access road construction;
- site establishment;
- earthworks;

- civil engineering works;
- building works;
- overhead line and underground cable installation;
- provision/ installation of permanent services;
- mechanical and electrical works;
- commissioning; and
- site reinstatement and landscape works.

Table 4-6: Walpole Substation: Summary of Key Characteristics

Factor	Details
Technology	400 kV
Indicative platform footprint	800 m by 200 m
Maximum height	Up to 20 m

4.6 Construction of the English Onshore Scheme

Construction compounds

4.6.1 Temporary construction compounds and laydown areas would be set up at strategic locations along the alignment, with associated access points from the existing road network. All compounds would be accommodated within the Scoping Boundary and would be sited alongside or adjacent to the relevant works. Where possible, a site would be chosen which is accessible for HGVs, has existing services and preferably has some hardstanding to avoid or reduce the need to create a level base for the compound. The importation of material would be required to provide hardstanding if suitable material is not already in place.

4.6.2 As a minimum it is assumed for the purposes of this Scoping Report that construction compounds would be required at the following locations:

- Landfall;
- Walpole converter stations;
- Walpole substation; and
- LCS converter station and DCSS.

4.6.3 The construction compounds would generally comprise of temporary cabin or modular style units that would be positioned to maximise construction space and limit the area of land take required. Such units would be used for the purposes of site management activities and also provide welfare accommodation for the construction workforce. As well as this, the construction compounds would provide distinct laydown areas for the storage of construction plant and for the delivery and removal of materials. Compounds may also be used for the stockpiling of materials to facilitate their transfer to and from

construction working area. Defined areas for staff parking would also be provided as part of the construction compound.

4.6.4 Security fencing or hoardings would be provided around the perimeter of each construction compound. The specification and construction of fences would depend on factors such as the level of security required and the degree of visual impact. Lighting of construction compounds would be designed to limit light pollution to the surrounding area.

4.6.5 Compounds would comprise a mix of satellite (approximate footprint 80 m by 80 m) for the underground cable installation and main compounds (for the substation and for the converter stations). Satellite compounds are smaller compounds with storage and laydown areas but unlike main compounds would not include offices.

4.6.6 All compound areas would be reinstated as soon as reasonably practicable after completion of the construction works and demobilisation.

Construction access

4.6.7 Site construction activities would begin with the preparation and installation of temporary access roads. Primary access would be from the existing road network. However, existing accesses from public highways may need to be widened, due to the size of the construction vehicles, or temporary new access tracks (including culverts and bridges) from the existing road network may be required, given the nature of works required and plant to be used. These would be connected to the haul roads that are located adjacent to the construction areas. In addition, there may be the requirement for bellmouths where these accesses meet the road network to enable the appropriate access arrangement for site traffic. Substations and converter stations (including the DCSS) would also require permanent access roads to be constructed. Further definition of the access routes and requirements would be provided as the design of the English Onshore Scheme progresses.

4.6.8 An Outline Code of Construction Practice (Outline CoCP) and an Outline Construction Traffic Management Plan (Outline CTMP) will be developed for the English Onshore Scheme which will outline the modes of transport proposed for the delivery of construction materials, plant, the construction workforce and the removal of waste materials. The aim of the Outline CoCP will be to reduce HGV and road traffic movements generated by the English Onshore Scheme where practical and possible. An Outline PRoW management plan (Outline PRoWMP) will also be developed setting out any temporary and permanent diversions of PRoW.

4.7 Construction programme timescales

4.7.1 Subject to gaining development consent in 2028, it is anticipated that access and construction of the Project would commence in 2028, starting with enabling works including site clearance activities, the installation of construction compounds and access roads. It is expected the main construction works (construction of the landfall, underground cables, overhead lines, converter stations, DCSS and substation) would continue through to 2034 (6 years).

4.7.2 Reinstatement would be required following the construction period. Based on the currently available design information, the earliest in service date (EISD) when the English Onshore Scheme would be operational is Q4 2034.

4.7.3 The construction programme will be developed as the Project progresses and will take account of seasonal constraints such as protected species breeding or hibernation seasons.

4.7.4 Further details on the phasing of the project will be set out within the ES.

4.8 Operation and maintenance

4.8.1 Routine inspection and periodic maintenance and repair of the English Onshore Scheme would be required during its operational lifetime. This would identify any damage or deterioration of the components or becoming life-expired and requiring replacement. Typical maintenance procedures are summarised in **Table 4-7.**

Table 4-7: Typical Maintenance Procedures

Scheme Element	Example Maintenance Works
Underground DC cable	Activity along the proposed DC cable route would generally be limited to non-intrusive inspections and cable repairs. The latter would only be required in the unlikely event of a cable fault. Where a fault does occur the location of the fault would be identified, and the faulty section of cable replaced. The activities involved in cable repair would be like those outlined above for installation, albeit over a much smaller section.
Underground AC cable	Activity along the proposed AC cable route would generally be limited to non-intrusive inspections and cable repairs. The latter would only be required in the unlikely event of a cable fault. Where a fault does occur the location of the fault would be identified, and the faulty section of cable replaced. The activities involved in cable repair would be like those outlined above for installation, albeit over a much smaller section.
Converter station (including DCSS)	The converter stations (including DCSS) would be operated by a small team that visit the site weekly and otherwise as and when required. During maintenance (planned and unplanned) the number of personnel present on site would increase with the number of staff proportionate to the nature of the maintenance works being undertaken. Visual inspections of equipment within substations to ensure smooth and efficient working. Servicing of equipment, such as cleaning, adjustment and lubrication. Repair and replacement of equipment which is faulty.
Substation	There would be no permanent personal working at the new Walpole substation. During maintenance (planned and unplanned) the number

Scheme Element	Example Maintenance Works
	of personnel present on site would be proportionate to the nature of the maintenance works being undertaken. Visual inspections of equipment within substations to ensure smooth and efficient working. Servicing of equipment, such as cleaning, adjustment and lubrication. Repair and replacement of equipment which is faulty.

4.9 Electric and Magnetic Fields

4.9.1 All equipment that generates, distributes or uses electricity produces Electric and Magnetic Fields (EMFs). Exposure limits for EMFs in the UK are set by the Government on advice from Public Health England, and the electricity industry strictly adheres to these limits. The exposure limits for both DC and AC cables originate from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines, published in 1994 and 1998 respectively and recently updated in March 2020.

4.10 Decommissioning

4.10.1 NPS EN-1 (Ref 4.3) Paragraph 4.3.5 states that the ES should cover the decommissioning of a project, however decommissioning of electricity networks is not specifically covered in NPS EN-5 (Ref 4.4) which recognises that generally, nationally significant electricity networks are likely to have an ongoing function, but will be subject to maintenance, reinforcement works and for assets to be replaced when they come to the end of their lifespan. There are currently no specific plans to decommission the English Onshore Scheme. It is expected that the transmission of electricity would continue for as long as there is a business case for doing so and that any decommissioning activity would occur decades into the future. To date, relatively few transmission projects have been decommissioned since the main expansion of such infrastructure in the 1950s and 1960s.

4.10.2 As set out in NPS EN-5 (Ref 4.4) Paragraph 2.1.4, it is stated that nationally significant electricity networks are likely to have an ongoing function, that will be subject to maintenance and reinforcement works. Such assets would be replaced at the end of their lifespan.

Converter Stations

4.10.3 The anticipated operational life of the proposed converter stations is approximately 40 years. It is likely that during this period refurbishment and plant replacement would extend the life of the proposed converter stations. If decommissioning is required, the scale and nature of activities would use similar methods as those required to install the assets and decommissioning would be separately assessed at the time. The main components would be dismantled and removed for recycling wherever possible. As a result, it is not proposed to assess the impacts of decommissioning as part of the EIA. In any event, it is not anticipated that impacts from decommissioning would present any greater environmental risk than any assessed impacts from the construction phase.

Substation

4.10.4 Typically, the above ground features of the substation would be removed (unless otherwise agreed). Any above ground buildings would be demolished and taken off site for suitable disposal along with any other above ground features such as electrical equipment. Any temporary access tracks and working areas required would be removed and the site reinstated to an appropriate end use.

4.10.5 If the English Onshore Scheme, or any part of it, is to be decommissioned, a written scheme of decommissioning would be submitted for approval by the relevant planning authorities at least six months prior to any decommissioning works. The decommissioning works would follow NGET processes at the time for assessing and avoiding or reducing any environmental impacts and risks.

HVAC and HVDC Underground Cables

4.10.6 If the English Onshore Scheme ceases to operate, dependent on the requirements at the time, the redundant cables could either be left in-situ, or all or parts of the cable could be removed for recycling. Where this is not possible, removed cables would be disposed of in accordance with the relevant waste disposal regulations at the time of decommissioning. If decommissioning is required, it is expected that it would use similar methods as those required to install the assets and decommissioning would be separately assessed at the time. As a result, it is not proposed to assess the impacts of decommissioning as part of the EIA. In any event, it is not anticipated that impacts from decommissioning would present any greater environmental risk than any assessed impacts from the construction phase.

Landfall

4.10.7 The expected minimum operational life of the proposed landfall infrastructure is 40 years, with replacement only expected to occur upon the failing of specific assets.

4.10.8 Upon the decommissioning of the English Onshore Scheme, all above ground assets at the proposed landfall would be removed to foundation level and foundations capped. The below ground transition joint bay providing onshore to offshore cable interface may be left in place. As a result, it is expected that there would be similar methods used as those required to install the asset and decommissioning would be separately assessed at the time. As a result, it is not proposed to assess the impacts of decommissioning as part of the EIA. In any event, it is not anticipated that impacts from decommissioning would present any greater environmental risk than any assessed impacts from the construction phase.

Overhead Line

4.10.9 If the English Onshore Scheme is required to be decommissioned, sections of overhead line which connect into the new Walpole 400 kV substation would be removed. Fittings such as dampers and spacers would be removed from the conductors. The conductors would be cut into manageable lengths or would be winched onto drums in a reverse process to that described for construction. The conductor, fittings and insulator assemblies would be removed from the pylons and lowered to the ground.

4.10.10 Each pylon would most likely be dismantled by crane, with sections cut and lowered to the ground for further dismantling and removal from site. Depending on the access and

space available, it may be possible to cut the pylon legs and then pull the pylon to the ground using a tractor. The pylon could be cut into sections on the ground. Unless there was a compelling need for removal of all the foundations, these would be removed to approximately 1.5 m deep, sufficient for safe agricultural use of the land and subsoil and topsoil reinstated. All waste would be removed from site and recycled in line with waste disposal regulations at the time.

Bibliography

Ref 4.1 The Planning Inspectorate (2018) Rochdale Envelope. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope (Accessed 27 March 2024)

Ref 4.2 National Grid (2024) Grimsby to Walpole Combined Routeing and Siting Study Report. Available at: https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/grimsby-to-walpole (Accessed 26 June 2024)

Ref 4.3 Department for Energy Security and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf (Accessed 26 March 2024)

Ref 4.4 Department for Energy Security and Net Zero (2023). National Policy Statement for electricity networks infrastructure (EN-5). Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 (Accessed 26 March 2024)

5. EIA Approach and Methodology

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5. EIA Approach and Methodology

5.1 The EIA Process

5.1.1 EIA is a process for identifying the likely significant environmental effects (positive and adverse) of a project to inform the decision-making process for development consent to be granted. The EIA process will culminate in the provision of an ES written in accordance with the EIA Regulations and will provide an overview of the likely significant effects associated with the English Onshore Scheme during the construction, operation and maintenance and decommissioning phases which will help to inform decision-making.

5.1.2 Schedule 4(4) of the EIA Regulations specifies that the ES should describe those:

"…factors…likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape."

5.1.3 Regulation 5(2) of the EIA Regulations requires the interaction between these factors to be considered. In addition, Regulation 5(4) requires ESs to consider:

"…the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development."

5.1.4 The EIA process aims to be systematic, analytical, impartial, consultative and iterative allowing opportunities for environmental concerns to be addressed in the design and evolution of the English Onshore Scheme. Typically, throughout the evolution of the design, a number of design iterations take place in response to environmental features identified during the EIA process, stakeholder engagement and consultation prior to the final design being submitted for approval. This iterative design process is a fundamental element of the EIA for the English Onshore Scheme, and this will be described further at later stages in the PEIR and ES as the design continues to develop.

5.1.5 As noted in **Part 1, Chapter 1 Introduction, Section 1.6**, the key EIA documents produced as part of the DCO EIA process include[9]:

- **Scoping Report:** The Scoping Report (this document) sets out the likely significant effects from a project, and therefore which environmental aspects should be scoped into the EIA and presented within the ES. The EIA scoping process will identify the different methodologies used for the assessment and these will be based on recognised good practice and guidelines specific to each environmental aspect as set out in **Part 2, Chapter 6 Biodiversity to Chapter 16 Health & Wellbeing.** The

9 NGET has notified the SoS in writing that they propose to provide an ES in respect of the English Onshore Scheme, and as such, a screening opinion is not considered necessary, in line with Regulation 8(1)(b) of the EIA Regulations.

Scoping Report is issued by the Planning Inspectorate to consultees for comment on the scope and methodology proposed, informing the scoping opinion.

- **Preliminary Environmental Information Report (PEIR):** The PEIR is defined in the EIA Regulations (Regulation 12(2)(b)) as:

  'information referred to in regulation 14(2) which –

  has been compiled by the applicant; and

  is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)'.

  - The PEIR helps inform consultees consultation responses during the Statutory Consultation and as such, it provides an opportunity for both the design of the English Onshore Scheme and the EIA to take into consideration any comments received through this consultation; and

- **Environmental Statement (ES):** The ES will be based on the most recently adopted scoping opinion and it will present the results of the EIA undertaken for the English Onshore Scheme. It identifies the likely significant effects that would result if the English Onshore Scheme were implemented, and details the measures envisaged to prevent, reduce and where possible offset any significant adverse effects. The ES will accompany the DCO application and will be considered carefully by the Planning Inspectorate to ensure that it is adequate and complies with the EIA Regulations.

5.1.6 This Scoping Report has been prepared in four separate 'parts' (**Part 1, Introduction**; **Part 2, English Onshore Scheme; Part 3, English Offshore Scheme; and Part 4, Project Wide**).

5.2 Receptor-based approach

5.2.1 Within this Scoping Report, and ultimately the ES, the methodology for assessing the significance of an effect will vary between environmental aspects but in principle, a receptor-based approach has been and will continue to be adopted i.e. based upon the environmental sensitivity (or value / importance) of a receptor and the magnitude of change from baseline conditions. Receptors are those aspects of the environment which may be sensitive to change as a result of the Projects. When deciding on which receptors to include within the Scoping Report, and subsequently the ES, consideration was given to Regulation 5(2) and Schedule 4 paragraph 4 of the EIA Regulations.

5.2.2 Where aspect-specific guidance requires that specific criteria or scales for determining significance are to be used, this will be outlined in the relevant chapter. The Scoping Report, and ultimately the ES, would also be supported by professional judgement and discussion from the technical specialist author to justify the final judgements on significance.

5.2.3 In instances where limited information is available, assessments have and will continue to apply a precautionary principle, in that reasonable worse-case scenario is assessed. Further details can be found below.

5.3 The ‘Rochdale Envelope’ approach

5.3.1 As noted in **Part 2, Chapter 4 English Onshore Scheme** of this Scoping Report, at this stage of the English Onshore Scheme lifecycle, an element of flexibility needs to be retained within the design, and subsequently the Scoping Boundary, in order to address uncertainties i.e. where some details of the English Onshore Scheme are yet to be confirmed. The Scoping Boundary and the description of the English Onshore Scheme presented in this Scoping Report are therefore based on a suitable ‘Rochdale Envelope’ having regard to the Planning Inspectorate’s Advice Note Nine (Ref 5.1), allowing for a realistic worst-case assessment to be undertaken and providing sufficient flexibility for the design to evolve.

5.3.2 The Scoping Report has therefore established the relevant design parameters for the purposes of assessment. Where uncertainty surrounds a particular parameter, the assessment has implemented a maximum design scenario i.e. it has established those parameters likely to result in the maximum adverse effect (the worst-case scenario). The reasonable worst-case scenario for any given design parameter may vary by technical aspect, depending on how that particular parameter may interact with the receptor being considered.

5.4 Determining the scope of the assessment

5.4.1 The EIA scoping process establishes which aspects of the environment are likely to be significantly affected by a project and involves identifying:

- the people and environmental resources (collectively known as 'receptors') that could be significantly affected by the English Onshore Scheme; and
- the work required to take forward the assessment of the likely significant effects.

5.4.2 Scoping is an important procedure, which sets the context for the EIA process. It is intended to inform a proportional and robust approach to assessment through initial evaluation and reporting of identified likely significant effects in a Scoping Report.

5.4.3 Effective scoping enables agreement to be reached on the aspects and methodologies to be taken forward, assessed and reported in much greater detail in the ES. It also provides an opportunity for early interaction with stakeholders, strengthening the assessment evidence base and allowing active participation of interested parties in project development and decision making. This can in turn improve project design, environmental soundness and social acceptability.

5.4.4 The approach taken in preparation of this Scoping Report has also been informed by the Planning Inspectorate’s Advice Note Seven (Ref 5.2) and reflects that the EIA Regulations require an ES to focus on aspects of the environment likely to be subject to significant effects. In line with guidance and legislation, this Scoping Report seeks to, where appropriate, scope out aspects/matters from further assessment with suitable justification provided. This will streamline the assessment to focus on likely significant effects and ensure the EIA for the English Onshore Scheme is proportionate in accordance with the IEMA (2017) Delivering Proportionate EIA guidance document (Ref 5.3).

5.4.5 When considering which aspects of the environment have the potential to be significantly affected by the English Onshore Scheme and therefore which aspects

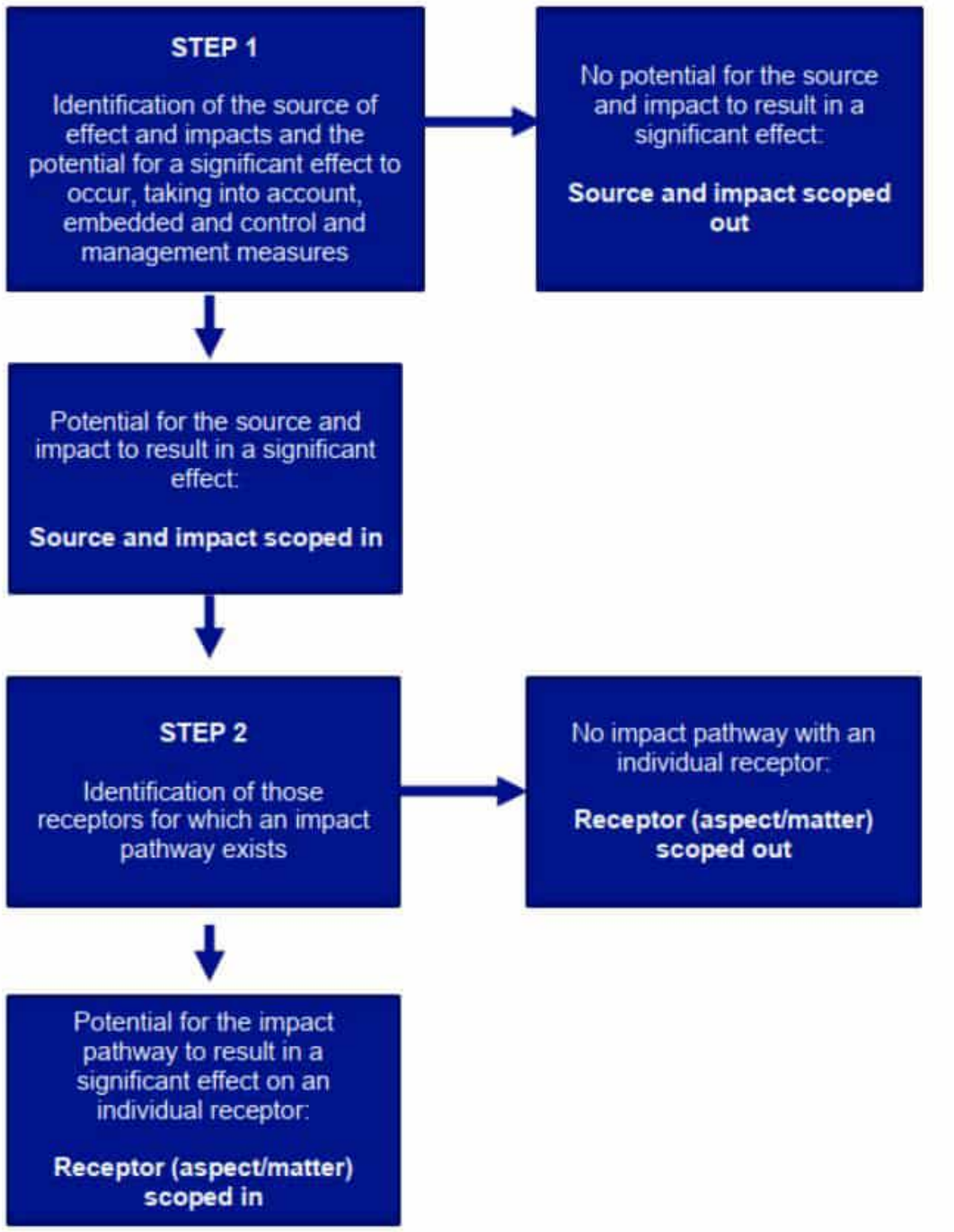
should be scoped into the assessment, a conceptual source-pathway-receptor approach has been adopted which considers the following criteria[10]:

- **source** - location of a material or activity that may be harmful i.e. the origin of the potential impacts (such as cable installation and a resultant impact e.g. mobilisation of contaminants);
- **pathway** - i.e. the route by which a harmful action or material is able to reach the receptor (for example, the mobilisation of contaminants could enter a local surface waterbody); and
- **receptor** - i.e. the feature or aspect of the receiving environment that is impacts; such as, humans, property, ecology, habitat, landscape, atmosphere, water, etc (for the example above, species living within the local waterbody).

5.4.6 Once the above criteria have been identified, they should be examined to assess the potential impact(s)[11] upon a receptor, and ultimately the significance of the effect[12] upon the receptor. In general, the impact assessment for each aspect will adopt this approach when considering the potential impacts arising during the construction, operation and decommissioning phases of the English Onshore Scheme. This approach allows for a transparent impact assessment and clear justification as to why particular aspects are either scoped in, or scoped out of, the EIA process. This approach is presented in Plate 1 below:

10 Environment Agency (2002) Environmental Impact Assessment (EIA) A handbook for scoping projects.
11 'impacts' are generally defined as the changes resulting from an action i.e. the changes that arise as a result of the project/proposed development, such as changes in drainage pattern.
12 'effects' are generally defined as the consequences of impacts / changes e.g. a habitat becomes degraded by changes in drainage pattern.

Plate 1: The source-pathway-receptor model of scope identification



Technical scope

5.4.7 The technical scope of assessment for each environmental aspect is detailed in **Part 2, Chapter 6: Biodiversity to Chapter 16: Health and Wellbeing** and this covers the scoping in and out of impacts and effects to be assessed as part of the EIA. Justification is provided for the individual approach and scoping of matters to be considered in the assessment for each environmental aspect. The technical scope also details the approach to baseline data collection and assessment methodologies.

Spatial scope

5.4.8 The spatial scope for each environmental aspect i.e. the area over which changes to the environment are predicted to occur as a consequence of the English Onshore Scheme, will depend on the nature of the potential effects and the location of receptors that could be affected. It takes account of:

- the physical area of the English Onshore Scheme;
- the nature of the baseline environment;
- the manner and extent to which environmental effects may occur; and
- relevant guidance, best practice and/or legislation

5.4.9 Each of the environmental aspect chapters (**Part 2, Chapter 6: Biodiversity to Chapter 16: Health and Wellbeing**) describes the study area to be considered, providing a clear explanation as to why the study area has been adopted. The spatial scope of each assessment may be refined for both the PEIR and the ES in response to comments from consultees or further assessment work.

Temporal scope

5.4.10 The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur, and are typically defined as either being temporary or permanent:

- Permanent - these are effects that will remain even when the English Onshore Scheme is complete, although these effects may be caused by environmental changes that are permanent or temporary.
- Temporary – these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes.

5.4.11 The assessment will have regard to the English Onshore Schemes programme and will evaluate the environmental effects of the English Onshore Scheme during construction, operation and maintenance. These effects will be compared to the situation prevailing before the English Onshore Scheme are commenced (the current baseline), and to the situation that would prevail in the future without the English Onshore Scheme (the projected future baseline). Construction is expected start in 2028 and is anticipated to take approximately five years, with the English Onshore Scheme expected to be operational by Q4 2033. The English Onshore Scheme is expected to operate (40 years); however, it is anticipated that rather than be decommissioned, parts would be replaced to extend the operational life.

5.4.12 The assumption is that the English Onshore Scheme would need to be removed if it cannot be re-purposed. Removal of the English Onshore Scheme is a similar process to construction but in reverse. The environmental impact of decommissioning can therefore not be fully assessed until the environmental conditions at the time of decommissioning are established. In any event, it is not anticipated that impacts from decommissioning would present any greater environmental risk than any assessed impacts from the construction phase. For the purposes of this EIA, it is proposed that decommissioning effects are not assessed at this stage. They will be assessed at the time of decommissioning in line with the applicable guidance and regulations at the time.

5.4.13 The future baseline is the theoretical situation that would exist in the absence of the English Onshore Scheme. This is based upon extrapolating the current baseline using technical knowledge of likely changes to predict this (e.g., predictable changes such as climate change, changes that can be predicted based on reasonable assumptions and modelling calculations, information about other relevant developments etc.).

5.4.14 Each environmental aspect chapter of the ES will define the baseline (current and future) against which the environmental effects of the English Onshore Scheme will be assessed. The baseline conditions to be assessed for each environmental aspect are outlined in **Part 2, Chapter 6: Biodiversity to Chapter 16: Health and Wellbeing** of this Scoping Report. Where relevant, aspect chapters provide further information on the time periods within the English Onshore Schemes programme that will be considered for their assessment.

5.5 Assessment of effects and determining significance

Overview

5.5.1 For consistency, and to allow comparison between aspects, the methodology described in this section will be applied when preparing the ES. This methodology is designed to consider whether impacts of the English Onshore Scheme would have an effect on any environmental receptors. Assessments will consider the magnitude of impacts and the sensitivity of resources or receptors that could be affected in order to classify the significance of effects.

5.5.2 The conclusion that is made on whether an effect should be considered significant is based upon professional judgement, with reference to the description of the English Onshore Scheme in **Part 2, Chapter 4: English Onshore Scheme** and available information about:

- the magnitude and other characteristics of the potential changes (impacts) that are expected to be caused by the English Onshore Scheme;
- the sensitivity of receptors to these changes;
- the effects of these changes on relevant receptors; and
- the value of receptors (where relevant).

5.5.3 For each environmental aspect, the categories of resource or receptor sensitivity and magnitude of impact will be described or defined.

5.5.4 The sensitivity or value of a receptor is largely the product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, higher value receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level. The use of a receptor also plays a part in the classification of its value or sensitivity. For example, when considering visual amenity, a receptor which is residential in nature may be valued more than a place of work as the environmental quality of the residential receptor is more likely to be an important part of that receptor's use. General criteria for defining the importance or sensitivity of receptors are set out in **Table 5-1**.

Table 5-1: Definitions of Value and Sensitivity for an Example Receptor

Receptor Value and Sensitivity	Description
Very High	Value: Very high importance and rarity, international scale (e.g. Internationally protected site). Sensitivity: The receptor has little or no capacity to absorb change without fundamentally altering its present character.
High	Value: High importance and rarity, national scale (e.g. Internationally or nationally protected site). Sensitivity: The receptor has a low capacity to absorb change without fundamentally altering its present character.
Medium	Value: Medium importance and rarity, regional scale (e.g. Regionally protected site). Sensitivity: The receptor has some tolerance to change without detriment to its character.
Low	Value: Low importance and rarity, local scale. Sensitivity: The receptor has a moderate capacity to absorb change without fundamentally altering its present character.
Negligible	Value: Not considered to be important (e.g. Common or widespread). Sensitivity: The receptor is resistant to change and has capacity to accommodate the proposed changes.

5.5.5 The magnitude of change affecting a receptor that would result from the English Onshore Scheme will be identified on a scale from minor alterations or change, up to major changes or the total or substantial loss of the receptor. For certain aspects, the magnitude of change would be related to guidance on levels of acceptability (for example, for air quality or noise), and is therefore based on numerical parameters. For others it will be a matter of professional judgement to determine the magnitude of change, using descriptive terminology. **Table 5-2** sets out the guidelines of the assessment of the magnitude of impact. Where relevant, individual topic chapters set out variations in magnitude description requirements.

Table 5-2: Definitions of Impact Magnitude Criteria

Impact Magnitude	Definition
High	Total loss or major alteration to key elements/features of the baseline conditions such that post development character/composition of baseline conditions would be fundamentally changed.

Impact Magnitude	Definition
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition would be materially changed.
Low	Some measurable change in attributes, quality or vulnerability; Minor shift away from baseline conditions. Changes arising from the alterations would be detectable but not material; the underlying character/composition of the baseline conditions would be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation.

5.5.6 The environmental aspect chapters (**Part 2, Chapter 6: Biodiversity to Chapter 16: Health and Wellbeing**) provide greater detail on the approach to the assessment and specific guidelines for the definition of impact magnitude and resource or receptor sensitivity. Where applicable standards mandated by professional bodies (for example the Chartered Institute of Ecology and Environmental Management (CIEEM) or the Landscape Institute) will also be considered.

Determination of significance

5.5.7 The significance of effects is derived with reference to information about the nature of the English Onshore Scheme, the sensitivity or value of receptors that could be affected, together with the magnitudes of change that are likely to occur.

5.5.8 For many environmental aspects, significance can be determined by using a matrix. Variations to this matrix approach, which may be applicable to specific environmental aspects are detailed within the respective chapters (**Part 2, Chapter 6: Biodiversity to Chapter 16: Health and Wellbeing**), along with descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant. Definitions of how the categories that are used in the matrix are derived for each environmental aspect are also set out.

5.5.9 In addition, professional judgement is applied in the assessment, as the boundaries between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may need clarifying.

5.5.10 The overarching significance matrix that will be used for the EIA is shown in **Table 5-3**. Reference is made to:

- 'Major' effects, which will always be determined as being significant;
- 'Moderate' effects can be significant, or not significant, based on specific scenarios and professional judgement; and
- 'Minor' or 'negligible' effects, which will always be deemed as 'not significant'.

5.5.11 Effects can be either beneficial or adverse.

Table 5-3: Significance Evaluation Matrix

Sensitivity or value	Magnitude of change: High	Medium	Low	Very low
High	Major (significant)	Major (significant)	Moderate (potentially significant)	Minor (not significant)
Medium	Major (significant)	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)
Low	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)	Negligible (not significant)
Very low	Minor (not significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)

5.6 Good Design Principles

5.6.1 The English Onshore Scheme will be designed, constructed, maintained, and operated in accordance with applicable health and safety legislation and regulations. The English Onshore Scheme will comply with relevant design safety standards including the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS) which sets out the criteria and methodology for planning and operating the National Electricity Transmission System. NGET policies and processes, which contain details on design standards required to be met when designing, constructing, maintaining, and operating assets such as those proposed on the English Onshore Scheme, will be adhered to.

5.6.2 The design principles will be informed by the National Infrastructure Commission (NIC) guidance (Ref 5.4) and will be established to inform the development of the English Onshore Scheme design, both for construction and operation. Design principles set desirable design outcomes which the English Onshore Scheme should endeavour to achieve, as far as is reasonably practicable, and facilitate an integrated design approach which draws together engineering, environment, sustainability and social value design considerations. Design principles ensure that these aspects are robustly addressed during the design, assurance and environmental assessment of the English Onshore Scheme. Applying the design principles additionally helps to ensure that the English Onshore Scheme meets the criteria in the relevant National Policy Statements.

5.6.3 The English Onshore Scheme will also be designed to comply with existing NGET standards and relevant external guidance and processes, such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for reducing effects in relation to electric and magnetic fields (EMFs).

5.7 Design and Control Measures

5.7.1 EIA is an iterative process and opportunities for measures to mitigate effects will be considered throughout the design evolution of the English Onshore Scheme and embedded into the design of the English Onshore Scheme. All of the types of measures listed below are referred to as 'design and control measures' and would be implemented as part of the English Onshore Scheme. The assessment of likely significant effects takes these measures into account when drawing conclusions regarding significance of effects.

5.7.2 The iterative design evolution process involves collaborative working between the design, environment and land teams. This may be through the consideration and adoption of alternatives or through measures incorporated within the final design itself. Where possible, these measures will be developed with input from key stakeholders together with appropriate technical standards, policies and guidance.

5.7.3 In accordance with Regulation 14(2)(c) of the EIA Regulations, the ES will include a description of the "*measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects of the Project on the environment*". For each environmental aspect, the EIA process will systematically identify impacts and effects and take into consideration mitigation measures that the English Onshore Scheme will adopt. These mitigation measures include avoidance, best practice and design commitments, which are classified into primary or tertiary measures in accordance with the IEMA 'Guide to Delivering Quality Development' (2016) definitions as follows.

- Primary (inherent): Measures which form part of the design of the English Onshore Scheme. They can include modifications to the location, design or operation of the English Onshore Scheme made during the pre-application phase. Examples would include amending the location of the English Onshore Scheme to avoid a sensitive feature such as a designated nature conservation site or reducing the height of a structure to minimise visual effects. They form an inherent part of the English Onshore Scheme, and do not require additional action to be taken.
- Secondary (foreseeable): Measures that require further activity in order to achieve the anticipated outcome, for example action post-consent. Examples would include the Archaeological Written Scheme of Investigation which outline proposals for further investigation post-consent.
- Tertiary (inexorable): Measures that would occur with or without input from the EIA feeding into the design development process. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard good practice used to manage commonly occurring environmental effects. Examples include construction management measures implemented to minimise the risk of nuisance or pollution effects.

5.7.4 Through the EIA process potentially significant adverse environmental effects will be fed back into the design process to verify whether they can be avoided or otherwise mitigated in accordance with the hierarchy. Alongside this, good practice control measures will be identified with reference to legislative requirements and measures of standard practice to manage commonly occurring effects. These design measures and good practice control measures will be included within the English Onshore Schemes design drawings and management plans.

5.7.5 Following the application of design and control measures, where the potential for a significant environmental effect remains, 'additional measures' will be considered to avoid, reduce or compensate this effect. The ES will report on the anticipated effects of the English Onshore Scheme following the implementation of all mitigation to determine the 'residual effects'. A clear statement will be made as to whether the residual effects are significant or not significant in EIA terms. Residual effects may be beneficial as well as adverse.

5.8 Monitoring

5.8.1 The ES will outline proportionate monitoring methods to be employed to ensure the effectiveness of mitigation. This will set out who will be responsible for monitoring, and the setting of clear objectives and parameters for monitoring. The ES will also identify the actions that will be undertaken should monitoring results fall below these set parameters.

5.9 Cumulative Effects Assessment

5.9.1 A cumulative effects assessment (CEA) will be carried out for the English Onshore Scheme and English Offshore Scheme (together, 'the Projects') which will examine the result from the combined impacts of the Projects with other developments on the same single receptor or resource as required under Paragraph 5 of Schedule 4 of the EIA Regulations and the interaction of environmental aspect effects occurring as a result of the Projects in accordance with Regulation 5(2). The methodology which will be adopted for the assessment of cumulative effects is provided in **Volume 1, Part 4, Chapter 35: Cumulative Effects** of this Scoping Report.

5.10 Transboundary effects

5.10.1 The EIA Regulations require an ES to consider the transboundary effects of a development (paragraph 5 of Schedule 4). Given the nature of the English Onshore Scheme and its proposed location, significant transboundary effects are unlikely as there are no pathways for effects to occur outside of the UK. Similarly, the English Offshore Scheme lies wholly in the UK waters. As outlined in the Planning Inspectorate's Advice Note Twelve (Ref 5.5) the screening process for transboundary effects will be carried out by the Planning Inspectorate. Information to inform this screening assessment will be provided as part of the application for consent.

5.11 Assumptions and Limitations

5.11.1 Assumptions and limitations are addressed under each environmental aspect for the English Onshore Scheme, as identified in the appropriate Scoping Report chapters (**Volume 1, Part 2, Chapter 6: Biodiversity to Chapter 16: Health and Wellbeing**).

5.12 Consultation and Engagement

5.12.1 Section 1.11 of **Part 1, Chapter 1: Introduction** explains what consultation is required to support the DCO process and provides a summary of the consultation and technical engagement that has been undertaken for the English Onshore Scheme to date.

5.12.2 All pre-application consultation has been and will continue to be undertaken in accordance with the *Planning Act 2008 (SI 2008 c. 29)* (as amended) and relevant guidance, including the Planning Inspectorate's Advice Note Seven (The Planning Inspectorate, 2020a).

Bibliography

Ref 5.1 The Planning Inspectorate (2018) Rochdale Envelope. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope (Accessed April 2024)

Ref 5.2 National Infrastructure Planning (2020). Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/ (Accessed 22 February 2024)

Ref 5.3 IEMA (2017). Delivering Proportionate EIA. A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice. Available at: file:///C:/Users/UKBXH028/Downloads/Delivering-Proportionate-EIA.pdf (Accessed 27 March 2024)

Ref 5.4 National Infrastructure Commission (February 2020). Design Principles for National Infrastructure. [online] Available: NIC-Design-Challenges-Pamphlet-Print-Spread-Version.pdf. (Accessed 4 June 2024)

Ref 5.5 The Planning Inspectorate (2020) Advice Note Twelve: Transboundary Impacts and Process. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-twelve-transboundary-impacts-and-process/#4.1 (Accessed 07 March 2024)

6. Biodiversity

nationalgrid

6. Biodiversity

6.1 Introduction

6.1.1 The biodiversity assessment will consider the potentially significant effects on biodiversity receptors that may arise from the construction and operation of the English Onshore Scheme.

6.1.2 This chapter of the Scoping Report sets out the relevant legislation, planning policy context and technical guidance used to inform the scope of the assessment and summarises any consultation and engagement in relation to biodiversity undertaken to date. It provides an overview of the baseline conditions relevant to biodiversity within/around the Scoping Boundary and relevant zones of influence. This chapter also sets out the measures which will be incorporated into the English Onshore Scheme to avoid and mitigate biodiversity effects, the likely significant effects to be considered within the assessment, and how these likely significant effects will be assessed for the purpose of an EIA.

6.1.3 This chapter should be read in conjunction and considered alongside the following chapters found in Volume 1:

- **Part 2, Chapter 4: English Onshore Scheme**
- **Part 2, Chapter 5: EIA Methodology**
- **Part 2, Chapter 8: Landscape and Visual Amenity**
- **Part 2, Chapter 9: Water Environment**
- **Part 2, Chapter 10: Geology and Hydrogeology**
- **Part 2, Chapter 11: Agriculture and Soils**
- **Part 2, Chapter 12: Traffic and Transport**
- **Part 2, Chapter 13: Noise and Vibration**
- **Part 2, Chapter 14: Air Quality**
- **Part 2, Chapter 33: Greenhouse Gas Emissions**
- **Part 3, Chapter 22: Designated Sites**
- **Part 3, Chapter 24: Intertidal and Subtidal Benthic Habitats**
- **Part 3, Chapter 25: Fish and Shellfish**
- **Part 3, Chapter 26: Intertidal and Offshore Ornithology**
- **Part 3, Chapter 27: Marine Mammals and Marine Reptiles**
- **Part 4, Chapter 35: Cumulative Effects.**

6.1.4 This chapter is supported by the following figures and appendices:

- **Volume 2, Appendix 6-A: Arboricultural Survey Methodology**

- **Figure 6.1: International designated sites for nature conservation within 10 km of the Scoping Boundary.**
- **Figure 6.2: Local and national statutory designated sites for nature conservation within 2 km of the Scoping Boundary.**

6.1.5 At this early stage in the development of the English Onshore Scheme, only limited desk-based information has been used for this scoping chapter. No data is yet available from field surveys to inform the Scoping Report; however, terrestrial ecology (including ornithology) and aquatic freshwater ecology surveys are to be undertaken in 2024 and 2025, further details are provided in Section 6.4 and Section 6.8.

6.2 Relevant Legislation, Planning Policy and Technical Guidance

6.2.1 This section identifies the relevant legislation, national and local policy and guidance which has informed the scope of the biodiversity assessment.

Legislation

6.2.2 A summary of the key legislation considered in, but not limited to, the scope of biodiversity effects is outlined in **Table 6-1**. The legislation presented in **Table 6-1** underpins and/or is considered in the following sections of this scoping chapter:

- Section 6.4 Baseline Conditions;
- Section 6.5 Design and Control Measures;
- Section 6.6 Scope of the Assessment; and
- Section 6.7 Assessment Methodology.

Table 6-1: Legislation relevant to Biodiversity

Legislation	Legislative Context
The Conservation of Habitats and Species Regulations (2017) (as amended) (the 'Habitats Regulations')[13] (Ref 6.1)	The objective is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. Regulations provide for the designation and protection of European sites (those part of the national site network), the protection of European protected species, and the adaptation of planning and other controls for the protection of European Sites. Following the UK's exit from the European Union (EU), The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019) (Ref 6.2) were enacted and resulted in amendments to the Habitats Regulations. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the UK no longer form part of the European Union's Natura (2000) ecological network. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019) created a national site

13 As amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Ref 6.2).

Legislation	Legislative Context
	network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes: • Existing SACs and SPAs; and • New SACs and SPAs designated under these Regulations. Any references to Natura 2000 in the 2017 Regulations and in guidance now refers to the new national site network. It is also a matter of government policy (part 187 of the National Planning Policy Framework; see **Table 6-2** below) that Ramsar sites, proposed Ramsar sites, potential SPA (pSPA) and possible SAC (pSAC) are also considered in the same way as SACs, SPAs and candidate SACs (cSACs). The above designations are collectively referred to as "European Sites" within this Scoping Report.
Wildlife and Countryside Act (WCA) (1981) (as amended) (Ref 6.3)	Protected birds, animals and plants are listed under Schedules 1, 5 and 8 respectively of the WCA 1981 (as amended). Invasive, non-native species are also listed under Schedule 9.
Natural Environment and Rural Communities (NERC) Act (2006) (as amended) (Ref 6.4)	Species and Habitats of Principal Importance in England and Wales are listed under Section 41 and Section 42 respectively of the NERC Act (2006). Section 41 and 42 lists species that are of principal importance for the conservation of biodiversity in England and should be used to guide decision-makers such as local and regional authorities when implementing their duty to have regard for the conservation of biodiversity in the exercise of their normal functions – as required under Section 40 of the NERC Act (2006).
Environment Act (2021) (Ref 6.5)	The Environment Act (2021) has two main functions: to give a legal framework for environmental governance in the UK, and to bring in measures for improvement of the environment in relation to waste, resource efficiency, air quality, water, nature and biodiversity, and conservation. This Act makes a 10% Biodiversity Net Gain (BNG) a statutory requirement for most developments. The act also strengthens the biodiversity duty under the NERC Act for public authorities to enhance biodiversity, rather than just conserve it.
The Invasive Alien Species (Enforcement and Permitting) Order (2019) (Ref 6.6)	For animal species under this order, it is an offence to release or allow them to escape into the wild, and for plant species it is an offence to plant or otherwise cause them to grow in the wild.
Protection of Badgers Act (1992) (Ref 6.7)	It is an offence to wilfully take, kill, injure, possess or ill-treat a badger. Under the Protection of Badgers Act (1992) their setts are protected against intentional or reckless interference. Sett interference includes damaging or destroying a sett, obstructing access to any part of the sett, or disturbance of a badger whilst it is occupying a sett. The Act defines a badger sett as 'any structure or place, which displays signs indicating the current use by a badger'

Legislation	Legislative Context
	and statutory bodies take this definition to include seasonally used setts that are not occupied but that show sign of recent use by badgers.
The Hedgerow Regulations (1997) (Ref 6.8)	Under The Hedgerows Regulations, it is an offence to remove a hedgerow (as defined within the Regulations) without obtaining local planning authority (LPA) permission. Should the hedgerow be deemed unimportant according to the criteria within the Regulations, the LPA is obliged to allow removal. However, if the hedgerow qualifies as 'Important' under the Regulations, the LPA must decide whether the reasons for removal justify the loss of an 'Important Hedgerow', with a presumption for retention.
Countryside and Rights of Way Act (2000) ('the CRoW Act') (Ref 6.9)	The CRoW Act has amended the WCA in England and Wales strengthening the protection afforded to Sites of Special Scientific Interest (SSSI) and the legal protection for threatened species. It adds the word 'reckless' to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.
Salmon and Freshwater Fisheries Act (1975) (Ref 6.10)	This Act covers regulation of fisheries in England and Wales and includes legislation that covers the introduction of polluting effluents, the obstruction of fish passage (screens, dams, weirs, culverts etc), illegal means of fishing, permitted times of legal fishing and fishing licencing (which covers electric fishing).
The Eels (England and Wales) Regulations (2009) (Ref 6.11)	The Eels (England and Wales) Regulations (2009) implement Council Regulation (EC) No 1100/2007 of the Council of the European Union (Ref 6.12), which required Member States to establish measures for the recovery of the stock of European eel. The Regulations give powers to the regulators (the Environment Agency in England) to implement recovery measures in all freshwater and estuarine waters. The aim of the regulations is to achieve 40 per cent escapement of adult eels relative to escapement levels under pristine conditions. The measures, as set out in the legislation, by which this is to be achieved is to reduce fishing pressures, improve access and habitat quality and reduce the impact of impingement and entrainment.

Planning Policy

6.2.3 A summary of the planning policies at both a national and local level relevant to the scope of biodiversity effects is given in **Table 6-2** and **Table 6-3**. These planning polices underpin and/or are considered in the following sections of this scoping chapter:

- Section 6.4 Baseline Conditions;
- Section 6.5 Design and Control Measures;
- Section 6.6 Scope of the Assessment; and
- Section 6.7 Assessment Methodology.

Table 6-2: National Planning Policy relevant to Biodiversity

Policy Reference	Policy Context
Overarching National Policy Statement for Energy (EN-1) (17 January 2024) (Ref 6.13)	
Section 4.6 Environmental and Biodiversity Net Gain	"*Energy NSIP proposals, whether onshore or offshore, should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, and the wider environment where possible.* *In England applicants for onshore elements of any development are encouraged to use the latest version of the biodiversity metric to calculate their biodiversity baseline and present planned biodiversity net gain outcomes. This calculation data should be presented in full as part of their application*."
Section 5.4 Biodiversity and Geological Conservation	"*Where the development is subject to EIA, the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats*." "*The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity conservation interests.* *Applicants should also consider wider ecosystem services and natural capital benefits when designing enhancement measures*."
National Policy Statement for Electricity Networks Infrastructure (EN-5) (17 January 2024) (Ref 6.14)	
Section 2.5 Environmental and Biodiversity Net Gain	"*Recognition that the linear nature of electricity networks infrastructure can allow for excellent opportunities to:* *i. reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or* *ii. connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements*."
National Planning Policy Framework (NPPF) (2023) (Ref 6.15)	
Paragraphs 8c, 180, 185, 186 and 187	The NPPF supports the delivery of net gains for biodiversity through sustainable development and seeks to protect and enhance biodiversity (including "*minimising impacts*"), promote conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species. LPAs should assess if significant harm would occur to biodiversity and refuse planning permission if such harm cannot be avoided, mitigated or, as a last resort, compensated for. Further, the NPPF advises that "*development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should*

Policy Reference	Policy Context
	be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists." The NPPF also identifies that Ramsar sites, proposed Ramsar sites, potential SPAs (pSPA) and possible SACs (pSAC) are also considered in the same way as SACs, SPAs and candidate SACs (cSACs).

Table 6-3: Local Planning Policy relevant to Biodiversity

Policy Reference	Policy Context
South Holland District Council, Boston Borough Council (South East Lincolnshire Local Plan 2011-2036, (adopted March 2019) (Ref 6.16))	
Policy 28: The Natural Environment	A high quality, comprehensive ecological network of interconnected designated sites, sites of nature conservation importance and wildlife-friendly greenspace will be achieved by protecting, enhancing and managing natural assets, including: internationally-designated sites, on land or at sea; nationally or locally-designated sites, and addressing gaps in the ecological network. Development proposals that affect such assets will only be permitted in exceptional circumstances.
East Lindsey District Council (East Lindsey Local Plan Core Strategy, (adopted July 2018) (Ref 6.17))	
Strategic Policy 24 (SP24) - Biodiversity and Geodiversity	Development proposals should seek to protect and enhance the biodiversity value of land and buildings and minimise fragmentation and maximise opportunities for connection between natural habitats. The Council will protect sites designated internationally, national or locally for their biodiversity importance, species populations and habitats identified in the Lincolnshire Biodiversity Action Plan and the NERC Act 2006. Development which could adversely affect such a site will only be permitted in exceptional circumstances. If adverse impacts are demonstrated to be unavoidable, the Council will ensure that such damage is kept to a minimum and will ensure appropriate mitigation, compensation or enhancement of the site through the use of planning conditions or planning obligations.
Strategic Policy 25 (SP25) – Green Infrastructure	The Council will safeguard and deliver a network of accessible green infrastructure by protecting and safeguarding green space, maximising opportunities for new and enhanced green infrastructure and publicly accessible open spaces in and around all communities and seek opportunities to connect existing green infrastructure to improve the network of spaces and accessibility for both the local population and wildlife.
Fenland District Council (Fenland Local Plan, May (2014) (Ref 6.18))	
Policy LP19 – The Natural Environment	"*The Council, working in partnership with all relevant stakeholders, will conserve, enhance and promote the biodiversity interest of the natural environment throughout Fenland*." The Council will "*protect and enhance sites which have been designated for their international, national or local*

Policy Reference	Policy Context
	importance to an extent that is commensurate with their status". The Council will also "*refuse permission for development that would cause demonstrable harm to a protected habitat or species, unless the need for and public benefits of the development clearly outweigh the harm and/or compensation measures can be secured to offset the harm and achieve, where possible, a net gain for biodiversity*". Also, the Council will "*promote the preservation, restoration and re-creation of priority habitats, and the preservation and increase of priority habitats identified for Fenland in the Cambridgeshire and Peterborough Biodiversity Action Plans*", and "*ensure opportunities are taken to incorporate beneficial features for biodiversity in new developments*".
King's Lynn and West Norfolk Council (Local Development Framework - Core Strategy, (adopted July 2011) (Ref 6.19))	
Policy CS08 Sustainable Development	All new development in the Borough should be of high-quality design. New development will be required to demonstrate its ability to (amongst other things) enhance the quality of the environment, optimise site potential and achieve high standards of sustainable design. These will be achieved through construction techniques, innovative use of re-used or recycled materials, reduction of on-site emissions by generation of cleaner energy and provision of green space.
Policy CS12 Environmental Assets	Proposals to protect and enhance biodiversity will be encouraged and supported. The Borough Council will ensure an integrated network of green infrastructure throughout urban and rural areas is successfully created and managed. The Council will support Biodiversity Action Plans (BAPs) and protect and enhance a variety of sites important for wildlife including County Wildlife Sites and ancient woodlands and BAP habitats. Developments should seek to avoid, mitigate or compensate for any adverse impacts on biodiversity. The Council will require development proposals to be accompanied by an ecological impact study and assessment proportionate to the degree of the impact and importance of the species affected.
Lincolnshire County Council (Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies, (adopted June 2016) (Ref 6.20))	
Strategic Objective H	A Strategic Objective of the Lincolnshire Minerals and Waste Local Plan is to "*protect Lincolnshire's high quality agricultural land… and soil where practicable from development; and in cases where it is affected, safeguard its long-term potential by encouraging restoration back to agriculture, or protection of soils through restoration schemes to biodiversity where soils are cared for in a sustainable manner, enabling habitat creation in addition to soil preservation for future agricultural needs*."
Policy DMI: Presumption in favour of	The County Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF. It will always work proactively with applicants jointly to find

Policy Reference	Policy Context
sustainable development	solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.

Technical Guidance

6.2.4 A summary of the relevant technical guidance, specific to the biodiversity assessment, that has informed this Scoping Report, and will inform the assessment within the PEIR and ES, is given in **Table 6-4**.

Table 6-4: Technical Guidance relevant to Biodiversity

Technical Guidance Document	Context	Section Considered
Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Second Edition v1.2 (2018, updated 2022) (Ref 6.21)	Provides guidance relevant to the assessment of potentially significant effects on biodiversity.	Section 6.7 Assessment Methodology
Guidelines for Preliminary Ecological Appraisal: Second Edition (2017) (Ref 6.22)	Provides guidance relevant to the assessment of potentially significant effects on biodiversity.	Section 6.7 Assessment Methodology

6.3 Consultation and Engagement

6.3.1 In respect of biodiversity, key consultees have been identified and focussed engagement (through both informal and formal consultation) will be undertaken and recorded throughout the pre-application stages of the project. Key consultees identified to date are:

- Natural England;
- Environment Agency;
- Relevant LPA ecological advisors;
- Relevant Wildlife Trusts (those of Lincolnshire, Norfolk and Bedfordshire, Cambridgeshire and Northamptonshire);
- Marine Management Organisation; and
- Royal Society for the Protection of Birds.

6.3.2 Key areas of consultation are intended to include the proposed study area(s) and survey extents, ecological features to be included in the assessment, proposed survey methodologies, approach to protected species licensing and Habitats Regulations Assessment (HRA).

6.3.3 Local or specialist groups will be contacted should the assessment process identify a need to engage further detailed local knowledge, or if requested during the statutory consultation process.

6.4 Baseline conditions

Study Area

6.4.1 The study areas encompass the area over which desk-based data was gathered to inform the biodiversity scoping assessment presented in this section. The study areas for the assessment of effects on ecological receptors presented within this Scoping Report have been identified through consideration of the nature of the development and also acknowledging the early stage of the English Onshore Scheme.

6.4.2 For the purpose of scoping, the biodiversity study areas are defined as land within the Scoping Boundary (**Figure 1-7 English Onshore Scheme Scoping Boundary**) plus appropriate buffers, as detailed below:

- All habitats and protected and/or notable species considerations are based on a broad overview assessment of aerial and OS imagery only (due to the early stage of the English Onshore Scheme): Scoping Boundary only.
- International designated sites: Scoping Boundary plus 10 km (extending to 30 km for bats).
- National and local statutory designated sites: Scoping Boundary plus 2 km.

6.4.3 The study areas are appropriate to the ecological resources considered and the likely Zone(s) of Influence (ZoI). The ZoI is variable dependant on the sensitivity of the ecological feature and the effect being considered. Best practice guidelines (Ref 6.21 and Ref 6.22) and ecological experience have contributed to determining the study areas.

6.4.4 The study area will be reviewed and amended in response to such matters as refinement of the design of the English Onshore Scheme, the identification of additional impact pathways and, where appropriate, in response to feedback from consultation. This is to ensure that there is sufficient data on which to conduct the assessment. These refinements are expected to reduce the extent of the study area as the design for the English Onshore Scheme progresses, whilst still reflecting recognised good practice.

Data Gathering Methodology

6.4.5 At this stage of the English Onshore Scheme, only freely available online information has been collated, including aerial imagery (Ref 6.23), OS mapping and the Multi-Agency Geographic Information for the Countryside (MAGIC) online mapping resources (Ref 6.24) to provide details on statutory designated sites. Habitats mapped under the Ancient Woodland Inventory (Ref 6.25) and the Priority Habitat Inventory (Ref 6.26), the majority of which relate to Habitats of Principal Importance (HPI), has also been collated. These inventories are determined using a combination of aerial and other mapping sources and occasionally ground truthing surveys. Therefore, the information to support this chapter is a broad overview and further desk and field-based surveys will be required to provide a more robust baseline for assessment (see Section 6.7 Assessment Methodology).

6.4.6 No data is yet available from field surveys to inform the Scoping Report due to the early stage of the English Onshore Scheme. However, terrestrial ecology (including ornithology) and aquatic freshwater ecology surveys are to be undertaken in 2024 and 2025 (and potentially early 2026).

6.4.7 Information regarding local/non-statutory designated sites has not yet been obtained and so is not detailed in this baseline section. However, this information shall be obtained from the local records centre(s) as the English Onshore Scheme progresses (Greater Lincolnshire Nature Partnership, Cambridgeshire and Peterborough Environmental Records Centre and/or Norfolk Biodiversity Information Service).

6.4.8 In addition to those sources detailed above, data is proposed to be requested from the following sources:

- Environmental Agency;
- The British Trust for Ornithology Wetland Birds Survey;
- LPAs (notably associated with identifying strategic significance as part of the BNG assessment);
- Local interest groups (such as the bat, badger and amphibian & reptile groups); and
- Wildlife Trusts (those of Lincolnshire, Norfolk and Bedfordshire, Cambridgeshire and Northamptonshire).

Current Baseline

6.4.9 The tables below provide the following details regarding designated sites:

- International designated sites for nature conservation within the 10 km study area **(Table 6-5**), including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites (shown on **Figure 6.1: International designated sites for nature conservation within 10 km of the Scoping** Boundary); and
- Local and National statutory designated sites for nature conservation within the 2 km study area (**Table 6-6**), including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR) (shown on **Figure 6.2: Local and national statutory designated sites for nature conservation within 2 km of the Scoping Boundary**).

6.4.10 A search up to 30 km was undertaken for SACs that include bats as a qualifying feature, although none were identified.

6.4.11 Chapel Point to Wolla Bank SSSI is located approximately 1.4 km south of the Anderby Creek landfall. The SSSI is designated for its geological features of interest and not ecological value. As such, the SSSI has not been included in **Table 6-6** below.

Figure 6-1
Biodiversity: International Designated Sites for Nature Conservation within 10km of the Scoping Boundary

Humber Estuary - SAC, SPA,Ramsar

Greater wash SPA

Inner Dowsing, Race Bank and North Ridge SAC

Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC

Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC

Gibraltar Point - Ramsar

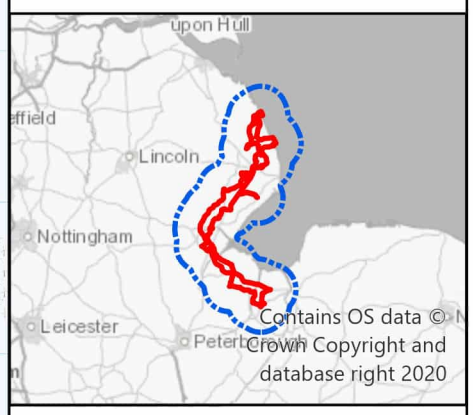
The Wash & North Norfolk Coast SAC

Legend
- Scoping Boundary
- Scoping Boundary 10km Buffer

Ramsar sites
- Gibraltar Point
- Humber Estuary
- The Wash

Special Protection Areas (SPA)
- Gibraltar Point
- Greater Wash
- Humber Estuary
- The Wash

Special Areas of Conservation (SAC)
- Humber Estuary
- Inner Dowsing, Race Bank and North Ridge
- Saltfleetby-Theddlethorpe Dunes & Gibraltar Point
- The Wash & North Norfolk Coast



Notes
This drawing is scaled at paper size A3, therefore any prints taken at smaller sizes will affect accuracy of the measurement units and should not be scaled against.

Coordinate System: British National Grid
Sheet X Centroid Coordinate: 555094.47E Sheet Y Centroid Coordinate: 358026.13N

0 2 4 8 12 Kilometers

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1	29/04/2024	DRAFT	KD	BS	DA

Title

Figure 6-1
Biodiversity: International designated sites for nature conservation within 10km of the Scoping Boundary

nationalgrid

Figure Number
Figure 6-1

Drawing Reference
EGL-WSP-CONS-XX-DR-G-012

Scale	Sheet Size	Sheet	Issue
1:500,000	A3	SHEET 1 OF 1	1

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Table 6-5: International Designated Sites within 10 km

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
Humber Estuary SPA	Range of wintering, migratory and breeding wetland birds **Qualifying Features:** • *Botaurus stellaris*; bittern (breeding and non-breeding) • *Tadorna tadorna*; common shelduck (non-breeding) • *Circus aeruginosus*; Eurasian marsh harrier (breeding) • *Circus cyaneus*; hen harrier (non-breeding) • *Recurvirostra avosetta*; avocet (breeding and non-breeding) • *Pluvialis apricaria*; European golden plover (non-breeding) • *Calidris canutus*; red knot (non-breeding) • *Calidris alpina alpina*; dunlin (non-breeding) • *Philomachus pugnax*; ruff (non-breeding) • *Limosa limosa islandica*; black-tailed godwit (non-breeding) • Limosa lapponica; bar-tailed godwit (non-breeding) • *Tringa totanus*; common redshank (non-breeding) • *Sterna albifrons*; little tern (breeding) • Waterbird assemblage.	Within Scoping Boundary at the Theddlethorpe landfall

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
Humber Estuary Ramsar	Range of habitats, migrant birds, lamprey and a grey seal *Halichoerus grypus* population (Ramsar criteria 1, 3, 5, 6 and 8). **Ramsar criterion 1:** The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. **Ramsar criterion 3:** The Humber Estuary Ramsar site supports a breeding colony of grey seals at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*. **Ramsar criterion 5:** Assemblages of international importance: waterfowl, non-breeding season **Ramsar criterion 6:** Species/populations occurring at levels of international importance: • Eurasian golden plover *Pluvialis apricaria altifrons* subspecies (passage and wintering) • Red knot *Calidris canutus islandica* subspecies (passage and wintering) • Dunlin *Calidris alpina alpina* subspecies (passage and wintering) • Black-tailed godwit *Limosa limosa islandica* subspecies (passage and wintering) • Common redshank *Tringa totanus brittanica* subspecies (passage and wintering) • Common shelduck (breeding and wintering) • Bar-tailed godwit *Limosa lapponica lapponica* subspecies (wintering).	Within Scoping Boundary at the Theddlethorpe landfall

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
	Ramsar criterion 8: The Humber Estuary acts as an important migration route for both river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* between coastal waters and their spawning areas.	
Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC	Contains various Annex I dune habitats. **Qualifying Features:** • Embryonic shifting dunes • Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram • Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland* • Dunes with *Hippophae rhamnoides*; Dunes with sea-buckthorn • Humid dune slacks.	Within Scoping Boundary at the Theddlethorpe landfall
Greater Wash SPA	Range of wintering, migratory and breeding wetland birds. **Qualifying Features** • *Gavia stellata*; red-throated diver (non-breeding) • *Melanitta nigra*; common scoter (non-breeding) • *Hydrocoloeus minutus*; little gull (non-breeding) • *Sterna sandvicensis*; sandwich tern (breeding) • *Sterna hirundo*; common tern (breeding) • Little tern (breeding).	Within Scoping Boundary at the Theddlethorpe landfall and Anderby Creek landfall
The Wash and North	Various Annex I habitats: sandbank, mudflat, sandflat, inlet, bay, reef, saltmarsh, Atlantic salt meadow, coastal scrub and lagoon habitats as well as Annex II common seal *Phoca vitulina* and otter *Lutra lutra*.	2.5 km east

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
Norfolk Coast SAC	**Qualifying Features:** • Sandbanks which are slightly covered by sea water all the time; subtidal sandbanks • Mudflats and sandflats not covered by seawater at low tide; intertidal mudflats and sandflats • Coastal lagoons • Large shallow inlets and bays • Reefs • Salicornia and other annuals colonising mud and sand; glasswort and other annuals colonising mud and sand • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*); Mediterranean saltmarsh scrub • Otter • Common seal.	
The Wash SPA	Range of wintering, migratory and breeding wetland birds. **Qualifying Features**: • *Cygnus columbianus bewickii*; Bewick's swan (non-breeding) • *Anser brachyrhynchus*; pink-footed goose (non-breeding) • *Branta bernicla bernicla*; dark-bellied brent goose (non-breeding) • Common shelduck (non-breeding) • *Anas penelope*; Eurasian wigeon (non-breeding) • *Anas strepera*; gadwall (non-breeding)	2.5 km east

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
	• *Anas acuta*; northern pintail (non-breeding) • *Melanitta nigra*; black (common) scoter (non-breeding) • *Bucephala clangula*; common goldeneye (non-breeding) • *Haematopus ostralegus*; Eurasian oystercatcher (non-breeding) • *Pluvialis squatarola*; grey plover (non-breeding) • Red knot (non-breeding) • *Calidris alba*; sanderling (non-breeding) • Dunlin (non-breeding) • Black-tailed godwit (non-breeding) • Bar-tailed godwit (non-breeding) • *Numenius arquata*; Eurasian curlew (non-breeding) • Common redshank (non-breeding) • *Arenaria interpres*; ruddy turnstone (non-breeding) • Common tern (breeding) • Little tern (breeding).	
The Wash Ramsar	Saltmarsh, intertidal sand and mudflats with shallow and deep channels and range of wintering, migratory and breeding wetland birds. **Ramsar criterion 1** The Wash is a large shallow bay comprising very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels. **Ramsar criterion 3**	2.5 km east

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
	Qualifies because of the inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters. The saltmarshes and the plankton in the estuarine water provide a primary source of organic material which, together with other organic matter, forms the basis for the high productivity of the estuary. **Ramsar criterion 5** Assemblages of international importance (species with peak counts in winter: waterfowl). **Ramsar criterion 6** Species/populations occurring at levels of international importance. Species with peak counts in spring/autumn: • Eurasian oystercatcher *Haematopus ostralegus ostralegus* • Grey plover *Pluvialis* squatarola • Red knot *Calidris canutus islandica* • Sanderling *Calidris alba* • Eurasian curlew *Numenius arquata arquata* • Common redshank *Tringa totanus totanus* • Ruddy turnstone *Arenaria interpres interpres*. Species with peak counts in winter: • Pink-footed goose • Dark-bellied brent goose • Common shelduck • Northern pintail • Dunlin *Calidris alpina alpina*	

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
	• Bar-tailed godwit *Limosa lapponica lapponica.* **Species/populations identified subsequent to designation for possible future consideration under criterion 6.** Species with peak counts in spring/autumn: • Ringed plover *Charadrius hiaticula* • Black-tailed godwit. Species with peak counts in winter: • European golden plover *Pluvialis apricaria Apricaria* • Northern lapwing *Vanellus vanellus*. Other flora and fauna are also listed, which are not designated site features but are listed as noteworthy.	
Humber Estuary SAC	Various Annex I habitats: estuaries, mudflat, sandflat, coastal lagoon, pioneer saltmarsh, Atlantic salt meadows and dunes, as well as Annex II lamprey and grey seal. **Qualifying features:** • Sandbanks which are slightly covered by sea water all the time; subtidal sandbanks • Estuaries • Mudflats and sandflats not covered by seawater at low tide; intertidal mudflats and sandflats • Coastal lagoons • Glassworts *Salicornia* and other annuals colonising mud and sand • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • Embryonic shifting dunes	4.5 km north

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
	• Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); shifting dunes with marram • Fixed dunes with herbaceous vegetation ("grey dunes"); dune grassland • Dunes with *Hippophae rhamnoides,* dunes with sea buckthorn • Sea lamprey • River lamprey • Grey seal.	
Gibraltar Point SPA	Dune, saltmarsh and other coastal habitats support wintering, migratory and breeding wetland birds. Qualifying Features: • Grey plover (non-breeding) • Sanderling (non-breeding) • Bar-tailed godwit (non-breeding) • Little tern (breeding).	7.5 km east
Gibraltar Point Ramsar	Dune, saltmarsh and other coastal habitats support wintering, migratory and breeding wetland birds and notable invertebrates. **Ramsar criterion 1** The dune and saltmarsh habitats present on the site are representative of all the stages of colonisation and stabilisation. There is a fine example of freshwater marsh containing sedges *Carex* spp., rushes *Juncus* spp., and ferns, including adder's-tongue fern *Ophioglossum vulgatum*. Also most northerly example of nationally rare saltmarsh/dune communities containing sea heath *Frankenia laevis*, rock sea lavender *Limonium binervosum* and shrubby seablite *Suaeda vera.* **Ramsar criterion 2**	7.5 km east

International Designated Site	Designated Feature Summary	Approximate Distance and direction from the Scoping Boundary (closest point)
	Supports an assemblage of wetland invertebrate species of which eight species are listed as rare in the British Red Data Book and a further four species listed as vulnerable. **Ramsar criterion 5** Assemblages of international importance - species with peak counts in winter (waterfowl). **Ramsar criterion 6** Species/populations occurring at levels of international importance. Species with peak counts in spring/autumn: • Grey plover • Sanderling • Bar-tailed godwit Species with peak counts in winter: • Dark-bellied brent goose. Species with peak counts in spring/autumn: • Red knot. Other noteworthy flora, birds, invertebrates and natterjack toad are also present.	

Figure 6-2
Biodiversity: Local and national statutory designated sites for nature conservation within 2km of the Scoping Boundary

Saltfleetby - Theddlethorpe Dunes
Lincolnshire Coronation Coast
Sea Bank Clay Pits
Willoughby Branch Line
Claxby Chalk Pit
Hoplands Wood
Willoughby Wood
Willoughby Meadow
Candlesby Hill
The Shrubberies

Inset A
Scale: 1:24,000

Inset B
Scale: 1:24,000

Inset C
Scale: 1:20,000

Inset D
Scale: 1:75,000

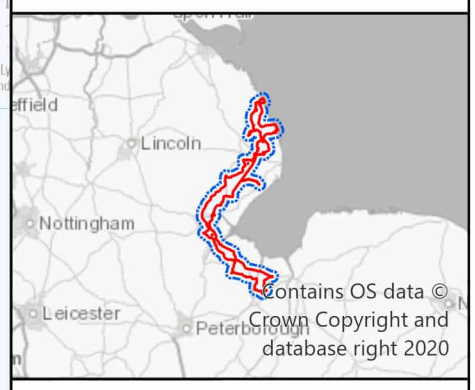
Inset E
Scale: 1:20,000

Legend
- Scoping Boundary
- Scoping Boundary 2km Buffer

Sites of Special Scientific Interest
- Candlesby Hill
- Claxby Chalk Pit
- Hoplands Wood
- Saltfleetby - Theddlethorpe Dunes
- Sea Bank Clay Pits
- Willoughby Meadow
- Willoughby Wood

National Nature Reserve
- Lincolnshire Coronation Coast

Local Nature Reserve
- The Shrubberies
- Willoughby Branch Line



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Notes
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Coordinate System: British National Grid
Sheet X Centroid Coordinate: 537067.47E Sheet Y Centroid Coordinate: 351768.95N

0 1 2 4 6 Kilometers

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Title
Figure 6-2
Biodiversity: Local and national statutory designated sites for nature conservation within 2km of the Scoping Boundary

nationalgrid

Figure Number: Figure 6-2

Drawing Reference: EGL-WSP-CONS-XX_DR-G-013

Scale	Sheet Size	Sheet	Issue
1:250,000	A3	SHEET 1 OF 1	1

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Table 6-6: Local and National Statutory Designated Sites within 2 km

National Designated Site	Designated Feature Summary	Distance and direction from the Scoping Boundary
Willoughby Meadow SSSI	Unimproved neutral grassland once common over Lincolnshire Middle Marsh boulder clay. Over one hundred species have been recorded from its small acreage. Surrounded by hedgerows, this field is still managed by the traditional means of taking a hay crop followed by grazing. Two small ponds are located at the field's edge.	Adjacent to Section 2: Bilsby – Welton le Marsh of the Scoping Boundary near Willoughby
Lincolnshire Coronation Coast NNR	The Lincolnshire Coronation Coast National Nature Reserve (LCCNNR) covers 33 square kilometres along almost 30 kilometres of the Greater Lincolnshire coast containing a rich variety of sand dunes, salt marshes, mudflats and freshwater marshes which are of international importance. The LCCNNR brings together the existing Donna Nook and Saltfleetby-Theddlethorpe Dunes National Nature Reserves, supporting many breeding and over-wintering birds, natterjack toads, special plants and insects.	Within Scoping Boundary at the Theddlethorpe landfall
Saltfleetby - Theddlethorpe Dunes SSSI	SSSI includes flats, dunes, salt and freshwater marsh which together support a rich flora and fauna. Notable assemblages of vascular plants, invertebrates and breeding birds and it is the most north-easterly breeding site in Britain for the natterjack toad. The intertidal sands and muds provide extensive feeding and roosting grounds for wildfowl and waders including brent geese, shelduck and dunlin. A succession of saltmarsh communities are present and support a range of floral species. Yellow wagtails *Motacilla flava* breed on the saltmarsh and there is a small colony of little tern on the shingle bank. The freshwater marsh and dune slacks have rich fen communities and are also the breeding grounds for natterjack toad and commoner amphibians. Ten species of dragonfly breed in the open water provided by ponds and dykes. Breeding birds include water rail *Rallus aquaticus*, snipe *Gallinago gallinago,* and reed *Acrocephalus scirpaceus*, grasshopper *Locustella naevia* and sedge *Acrocephalus schoenobaenus* warblers.	Within Scoping Boundary at the Theddlethorpe landfall

National Designated Site	Designated Feature Summary	Distance and direction from the Scoping Boundary
	At the interface between freshwater marsh and dunes, southern and early marsh orchids *Dactylorhiza praetermissa* and *D. incarnata* are found in abundance. The diverse flora of the mature lime-rich dunes includes pyramidal and bee orchids *Anacamptis pyramidalis* and *Ophrys apifera*, and lesser meadow rue *Thalictrum minus.* Invertebrates recorded include several notable moths and nationally rare species from the moth and beetle families. There are outstanding breeding densities of birds in the dune scrub, with whitethroat *Sylvia communis* a major constituent. Also present are lesser whitethroat *Sylvia curruca* and long-eared owl *Asio otus.* The oldest areas of scrub now contain breeding blackcap *Sylvia atricapilla*, garden warbler *Sylvia borin* and nightingale *Luscinia megarhynchos*.	
Sea Bank Clay Pits SSSI	Notable reedbed and wetland habitats supporting notable invertebrates and plant species, and breeding, wintering and passage birds. The Sea Bank Clay Pits comprise a series of isolated flooded clay workings of varying size, depth and topography which now support uncommon aquatic plant communities characteristic of the slightly brackish, eutrophic (nutrient-rich) water in addition to extensive reedbeds and a rich marginal wetland flora. The pits were excavated in 1953 to provide material for the repair of the sea wall between Mablethorpe and Chapel St. Leonards on the Lincolnshire Coast. The pits are also important for breeding, wintering and passage birds. They are known to support a rich aquatic invertebrate fauna, notably beetles, including several nationally scarce species and others new to the County. The water plant communities of the pits are characterised by fennel pondweed *Potamogeton pectinatus*, lesser pondweed *P. pusillus*, horned pondweed *Zannichellia palustris*, spiked watermilfoil *Myriophyllum spicatum*, algae of the genus *Enteromorpha* and two nationally scarce species: brackish water crowfoot *Ranunculus baudotii* and soft hornwort *Ceratophyllum submersum*. Superimposed upon this basic suite of species are variations such as the local dominance of Canadian waterweed *Elodea canadensis* and the moss *Fontinalis antipyretica*. In addition there is abundant amphibious bistort *Polygonum amphibium* and rigid hornwort *C. demersum.* Large stands of common reed *Phragmites australis* occur as a broad margin, especially at Huttoft. Associated with the reedbeds are sea clubrush *Scirpus maritimus*, branched bur-reed *Sparganium erectum*, reedmace *Typha latifolia* and false fox and greater pond sedges *Carex otrubae* and *C. riparia.*	20 m north of the Anderby Creek landfall and Section 1: Landfalls - Bilsby of the Scoping Boundary

National Designated Site	Designated Feature Summary	Distance and direction from the Scoping Boundary
	Large colonies of common spotted orchid *Dactylorhiza fuchsii* occur at Wolla Bank in marshy ground. Here, the flora clearly reflects a brackish influence since wild celery *Apium graveolens*, sea couch *Elymus pycnanthus*, saltmarsh rush *Juncus gerardii* and sea arrowgrass *Triglochin maritimus* are present.	
Willoughby Wood SSSI	Ancient woodland supporting rich flora and notable breeding birds. Willougby Wood is representative of the series of ancient woodlands found on the middle Marsh Boulder Clay on the edge of the Lincolnshire Wolds. It is predominantly oak-ash and hazel, managed as coppice with standards. This supports a characteristic and rich ground flora. The site is notable for its breeding birds. In addition to pedunculate oak *Quercus robur* and ash *Fraxinus excelsior* the field maple *Acer campestre* is common in the margin and within the wood, on pockets of lime-rich soil. The shrub layer includes dogwood *Cornus sanguinea*, guelder rose *Viburnum opulus*, goat willow *Salix caprea* and the occasional thicket of blackthorn *Prunus spinosa.* The more open canopy has a ground flora dominated by bramble *Rubus fruticosus* but there is an abundance of ferns, including male fern *Dryopteris filix-mas* and broad buckler *D. dilatata*. One ride is notable for the quantity of woodruff *Galium odoratum* and the wood banks are dominated by dog's mercury *Mercurialis perennis* and wood false brome *Brachypodium sylvaticum*. Though enrichment of the soil beneath the heronry has favoured plants like nettle *Urtica dioica*, scarcer plants are found throughout the wood. These include early purple orchid *Orchis mascula*, wood anemone *Anemone nemorosa*, broad-leaved helleborine *Epipactis helleborine*, wood speedwell *Veronica montana*, yellow pimpernel *Lysimachia nemorum* and toothwort *Lathraea squamaria*. The abundance of the moss *Fontinalis antipyretica* is a feature of the spring and stream. Breeding birds include heron *Ardea Cinerea*, woodcock *Scolopax rusticola*, tawny owl *Strix aluco* and greater spotted woodpecker *Dendrocopos major*.	380 m west of Section 2: Bilsby – Welton le Marsh of the Scoping Boundary
Candlesby Hill SSSI	Extensive chalk grassland with scrub and woodland supporting notable plants, invertebrates and birds. One of the best remnants of the once extensive chalk grasslands of the southeast Lincolnshire Wolds. Together with surrounding scrub and broad-leaved woodland, the site provides an excellent example of the sequence of change to a mature system.	440 m northwest of Section 3: Welton le Marsh – Little Steeping of the Scoping Boundary

National Designated Site	Designated Feature Summary	Distance and direction from the Scoping Boundary
	The ash woodland, which contains some sycamore *Acer pseudoplatanus*, is edged by scrub merging into open grassland forming an amphitheatre with the exposed chalk cliff. Herbs growing in association with woody species include false brome *Brachypodium sylvatica*, black bryony *Tamus communis*, hound's tongue *Cynoglossum officinale* and twayblade *Listera ovata*. Finches and warblers are well represented and include garden warbler and lesser whitethroat. The dominant species in the grassland are tor grass *Brachypodium pinnatum*, and meadow oat *Avenula pratensis*. There are extensive areas of marjoram *Origanum vulgare*, perforate St. John's wort *Hypericum perforatum*, carline thistle *Carlina vulgaris* and burnet saxifrage *Pimpinella saxifraga*. Plants scarce in the East Midlands include bladder campion *Silene vulgaris*, dropwort *Filipendula vulgaris* and small scabious *Scabiosa columbaria*. Orchids include pyramidal, common spotted and bee *Ophrys apifera*. Butterflies are present in large numbers and 17 species of mollusc have been recorded.	
The Shrubberies LNR	The Shrubberies comprise old parkland and pasture of a type now rare in the fens with fine oak and other large trees. A total of 49 species of birds and 12 species of butterflies have been recorded. There is a pond with a wooded island and adjoining marshy areas with fringing alders *Alnus glutinosa.* The grassland is grazed and sometimes cut for hay. An acre of land was planted with native trees in 1989.	560 m northeast of Section 7: Moulton Seas End – Foul Anchor of the Scoping Boundary
Willoughby Branch Line LNR	The reserve is part of the disused branch railway from Willoughby to Mablethorpe. Since the line was taken up in 1971, the track has developed into a fine wildlife area with ashwood, hawthorn scrub and grassland supporting a varied flora, including abundant bird's-foot trefoil *Lotus corniculatus* and restharrow *Ononis repens*, hemp-agrimony *Eupatorium cannabinum*, spotted orchid, twayblade *Neottia ovata*, lady's bedstraw *Galium verum*, yellow-wort *Blackstonia perfoliata* and great burnet *Sanguisorba officinalis*. Butterflies include common blue *Polyommatus icarus* and several species of skippers and browns. Whitethroat, lesser whitethroat, blackcap, sedge warbler *Acrocephalus schoenobaenus*, redpoll *Carduelis Flammea* and other finch species, and occasionally nightingale, nest in the reserve. Hips and haws attract fieldfares *Turdus pilaris* and redwings *Turdus iliacus* in winter, and barn owls *Tyto alba* frequently use the track for hunting.	580 m west of Section 2: Bilsby – Welton le Marsh of the Scoping Boundary

National Designated Site	Designated Feature Summary	Distance and direction from the Scoping Boundary
Hoplands Wood SSSI	Situated on the northern side of a shallow valley on the poorly draining boulder clay of the Lincolnshire Middle Marsh, Hoplands Wood is one of the best remaining examples of oak/ash ancient woodland in north Lincolnshire. It is characterised by a local abundance of alder and a mosaic of tree species perpetuated by a long history of woodland management promoting both high forest and coppice-with-standards. This favours a rich and varied ground flora and breeding bird community. Pedunculate oak *Quercus robur* and ash occur throughout as standards and old coppice. Wych elm *Ulmus glabra* is concentrated on the eastern side of the wood where hornbeam *Carpinus betulus,* rare in Lincolnshire, is found. Field maple is on marginal pockets of lime-rich soil. Coppiced hazel *Corylus avellana* is within a species-rich shrub layer of dogwood *Cornus sanguinea*, goat willow, holly *Ilex aquifolium*, guelder rose and blackthorn. Dog's mercury is locally abundant. Elsewhere brambles *Rubus* spp. are found with bluebells *Hyacinthoides non-scripta*, greater stitchwort *Stellaria holostea*, honeysuckle *Lonicera periclymenum* and male and broad buckler ferns *Dryopteris filix-mas* and *D. austriaca*. Uncommon plants include herb paris *Paris quadrifolia*, broad-leaved helleborine, greater butterfly orchid *Platanthera chlorantha*, and soft shield fern *Polystichum setiferum*, primrose *Primula vulgaris*, wood anemone and woodruff *Galium odoratum* all occur in quantity. Of two hundred species of moths recorded the buttoned snout *Hypena rostralis* is notable. Breeding birds include woodcock, tawny owl, greater spotted woodpecker, tree creeper *Certhia familiaris* and four species of warblers.	950 m west of Section 2: Bilsby – Welton le Marsh of the Scoping Boundary
Claxby Chalk Pit SSSI	Disused quarry with chalk grassland, scrub, woodland, supporting a range of plants, invertebrates, birds and bats. Notable example of Lincolnshire Wolds chalk grassland, which only survives in disused quarries or on steep, unploughable slopes. Since this grassland is in the context of an old chalk pit, its value is increased for it represents a stage within the process of continuous changes from grassland through to scrub and broad-leaved woodland. The grassland is dominated by characteristic chalk downland species: upright brome *Bromus erectus* and red fescue *Festuca rubra* with meadow oat *Avenula pratensis*, tor grass *Brachypodium pinnatum* and quaking grass *Briza media* locally common. Within this sward are numerous herbs (each abundant) dependent upon the very high levels of calcium in the soil;	1.9 km west of Section 2: Bilsby – Welton le Marsh of the Scoping Boundary

National Designated Site	Designated Feature Summary	Distance and direction from the Scoping Boundary
	examples are marjoram, hawkweed oxtongue *Picris hieraciodes*, wild basil *Clinopodium vulgare*, wild carrot *Daucus carota* and perforate St John's-wort *Hypericum perforatum*. Four orchid species occur bee, pyramidal, common spotted and twayblade. The hawthorn and blackthorn scrub has abundant wild rose *Rosa canina*. The areas of woodland to the south and fringing the quarry to the east and west are dominated by beech *Fagus sylvatica* and ash with some pedunculate oak and sycamore. In the ground flora dog's mercury is locally dominant with violets *Viola* spp, primrose and toothwort. Breeding birds include spotted flycatcher *Muscicapa striata*, tawny owl and pied wagtail *Motacilla alba*. Woodcock occurs. Both pipistrelle *Pipistrellus* spp. and long-eared bats *Plecotus auritus* are regularly seen.	

Habitats

Habitats of Principal Importance (HPI)

6.4.12 HPIs within the Scoping Boundary as identified thorough the Priority Habitat Inventory layer on MAGIC (Ref 6.24) are as follows:

- coastal and floodplain grazing marsh;
- coastal saltmarsh;
- coastal sand dunes;
- rivers (including headwater areas); and
- lowland meadows.

6.4.13 Deciduous woodland is also present, which may qualify as lowland mixed deciduous woodland HPI.

6.4.14 Habitats detailed on the Priority Habitat Inventory layer may be based largely on desk-based habitat classification exercises and would therefore need to be ground truthed through ecological surveys to confirm their status as HPI. Moreover, there may be other HPI present in the Scoping Boundary, which are not listed above and would also need to be confirmed by ecological field survey.

Ancient Woodland / Veteran & Ancient Trees

6.4.15 Areas of ancient woodland which are logged on the Ancient Woodland Inventory (Ref 6.25) have largely been avoided through an initial scoping exercise to remove areas of particularly high ecological value such as this from the Scoping Boundary.

6.4.16 Areas of unmapped ancient woodland may be present which would need to be identified through a combination of field survey and review of other desk-based sources such as historical mapping.

6.4.17 Presence of any veteran trees are as yet unknown. However, from aerial imagery, a number of scattered trees are present throughout the Scoping Boundary which could be veteran or ancient. The presence of veteran and ancient trees shall be confirmed during further survey and assessment.

Other Habitats

6.4.18 Aerial imagery shows the dominant habitat throughout the Scoping Boundary to be agricultural land, predominately arable fields bounded largely by artificial field drains. These are interspersed by pockets of scrub, woodland and scattered trees as well as ponds and watercourses including the River Welland and the River Nene. The potential landfall options at Theddlethorpe and Anderby Creek also support coastal sand dunes and other coastal habitats including intertidal beach/foreshore areas leading into the North Sea.

Waterbodies

6.4.19 Most of the waterbodies in the Scoping Boundary appear to comprise artificial field drains that surround arable fields, with occasional major watercourses such as the artificially straightened sections of the River Welland, River Nene and the South Forty

Foot Drain. Field ponds and other areas of standing water are occasionally scattered across the Scoping Boundary study area. Ditches that contain standing water may also be present.

Protected/Notable Species

6.4.20 The landscape and habitats described above have the potential to support a range of protected and/or notable species for foraging, commuting, resting, sheltering and breeding, including:

- birds (wintering, breeding, passage and intertidal)
- bats
- badgers *meles meles*
- otter
- water vole *Arvicola amphibius*
- amphibians, including:
  - natterjack toad
  - great crested newt *Triturus cristatus*
  - toad *Bufo bufo*
- reptiles
- brown hare *Lepus europaeus*
- hedgehog *Erinaceus europaeus*
- invertebrates (terrestrial and aquatic)
- fish
- notable terrestrial or aquatic plant species (including invasive, non-native species).

Future Baseline

6.4.21 It is not known at this stage whether a different future baseline (in the absence of the English Onshore Scheme) is more likely to occur than that currently present. However, as the majority of the Scoping Boundary comprises agricultural land, it is reasonable to assume management of such habitat would continue (in the absence of the English Onshore Scheme or other development) and this baseline habitat would remain comparable.

6.4.22 Due to climate change, it is possible that in the medium to long term the range of some species may be altered. Any potentially relevant changes to the baseline would be reviewed during the EIA process and, should any likely instances be identified, the implications will be considered on a case-by-case basis within the EIA. A description of the potential future baseline will also be provided in the ES.

6.4.23 It is recognised that there are a number of other proposed and committed developments within the surrounding area that could alter the future baseline in the absence of the project. The potential for cumulative effects will be considered as part of the future EIA documents in accordance with the approach and guidance outlined within **Part 4, Chapter 35: Cumulative Effects**.

6.5 Design and Control Measures

6.5.1 A high-level optioneering study (the CPRSS, as detailed in **Part 2, Chapter 3: Consideration of Alternatives**) has been undertaken to identify the preferred routeing and siting of the proposed infrastructure to ensure that environmental effects would be avoided. As part of the English Onshore Scheme design process, a number of design and control measures will be proposed to reduce the potential for impacts on ecological receptors. These measures will evolve as part of design development and in response to consultation. These measures will be fed iteratively into the assessment process. These measures typically include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation requirements.

6.5.2 As there is a commitment to implementing these design and control measures, these have been considered in the scoping assessment.

Construction Phase

6.5.3 A range of standard measures for the English Onshore Scheme are likely to be adopted throughout the duration of the construction phase. Design and control measures relevant to ecology and proportionate to risk would be fully outlined in the Outline Code of Construction Practice (Outline CoCP), prepared to accompany the ES. A summary of these measures is detailed below in **Table 6-7** (which is not an exhaustive list).

Table 6-7: Relevant Biodiversity Design and Control Measures: Construction

Design and Control Measure Proposed
Where practical, sensitive habitats including non-statutory and statutory designated sites, ancient woodland and HPI would be avoided by design (siting and alignment) of the English Onshore Scheme. At discrete locations, should these emerge during the design process, avoidance would also be sought when micro-siting the likely working areas.
Where appropriate, trenchless crossing methods (such as HDD) would be used at sensitive locations (for example the landfall and main rivers) to avoid or reduce impacts during construction.
At sensitive crossing locations (e.g. rivers), existing access routes would be used as far as possible and the width of any required working area reduced as far as practicable. If access upgrades are required, temporary bridges will be used in preference to culverts. Where culverts are unavoidable, these will either be arch culverts, leaving the natural bed alone, or they would be installed with the invert set below the natural bed level for a semi-natural bed to establish within the culvert.
Prior to construction, a suitably qualified and experienced (or team of suitably qualified and experienced) Ecological Clerk of Works (ECoWs) will be appointed to support the Construction Contractor with implementation of ecological mitigation.
Vegetation clearance would be kept to a minimum and vegetation retained where possible. To avoid destruction of active nests, where practicable, vegetation clearance of suitable habitat would be undertaken outside the breeding bird season (outside the period March to August, inclusive). Where this is not possible, clearance would be undertaken following a pre-commencement inspection by a suitably experienced ecologist to confirm the presence/absence of active nests. If an active nest is identified, a suitable exclusion zone

Design and Control Measure Proposed
(minimum of 5 m, but may be increased at the advice of the ecologist depending on species) would be implemented and remain in place until the ecologist confirms the nest is no longer active. Suitable methods would also be used to ensure vegetation with potential to support other legally protected species (e.g. reptiles) is removed sensitively, under the supervision of an ECoW (if needed) and in compliance with legal requirements.
In line with good practice, pollution prevention plans will be drawn up to detail how ground and surface waters would be protected during construction and operation. These will include information on the storage of any fuels, oils and other chemicals and pollution incidence response planning.
In line with good practice, an Outline CoCP will ensure that the risk of effects on ecological features from dust emissions is negligible through the use of standard dust suppression methods. It is anticipated that the Outline CoCP would be prepared by the Construction Contractor.
Areas of temporary habitat loss would be reinstated, wherever practicable, following the completion of construction in each area. Wherever possible, reinstatement would be back to the type and condition of habitat affected.
A lighting design of all temporary and permanent lighting during construction would be developed once Construction Contractor(s) are appointed. However, the principles of lighting design will be detailed at the time of application and informed by the joint guidance provided by the Institution of Lighting Professionals and the Bat Conservation Trust (Ref 6.27). The lighting design will account for the potential effects on terrestrial ecology by taking measures to minimise lighting usage, minimise light spill, use most appropriate wave lengths of light and locate lighting in the most appropriate locations. This is to decrease the potential displacement effects on light sensitive fauna such as bats.
Speed limits would be imposed on all construction haul roads and access tracks to minimise the risk of road traffic collisions with fauna such as badgers, otters, bats and barn owls.
If invasive non-native plant species are identified through field survey and/or desk study, where practicable, works areas would be microsited to avoid contaminated locations. Where this is not possible, biosecurity measures would be implemented to prevent the spread of invasive species from construction activities.
A BNG equivalent to 10% above the existing baseline will be built into the English Onshore Scheme through the design process. This may entail both on-site and off-site habitat compensation. This is anticipated to be mandatory under the Environment Act 2021 (Ref 6.5) at the time of DCO application.

Operational Phase

6.5.4 At this early stage of the English Onshore Scheme, design and control measures during the operational phase are anticipated to be required primarily at the locations of permanent infrastructure (converter stations and substations).

6.5.5 The measures detailed in **Table 6-7** above in relation to lighting (temporary and permanent) design would also be applied to operational lighting.

6.5.6 The requirements for further design and control during the operational phase will be explored during the design process of the English Onshore Scheme.

6.6 Scope of the assessment

Potential sensitive receptors

6.6.1 The following have been identified as potential ecological receptors which may be impacted during the construction and/or operation of the English Onshore Scheme based on a desk-based review of the habitats across the Scoping Boundary and within ZoIs:

- international designated sites for nature conservation within 10 km
- local and national designated sites for nature conservation within 2 km
- birds (wintering, breeding, passage and intertidal)
- bats
- badgers
- otter
- water vole
- amphibians (including natterjack toad, great crested newt and toad)
- reptiles
- brown hare
- hedgehog
- invertebrates (terrestrial and aquatic)
- fish
- notable terrestrial or aquatic plant species (including invasive, non-native species).

6.6.2 It should be noted that the majority of sensitive ecological receptors are likely to be primarily affected during the construction phase. Potential operational impacts are anticipated to be localised around permanent infrastructure (converter stations, DCSS and substations) and sites of maintenance activities (if needed) along the cable route.

Ecological receptors scoped out from further assessment

6.6.3 At this early stage of the English Onshore Scheme, most ecological receptors are proposed to be scoped into the assessment. This shall be reviewed throughout the design progression of the English Onshore Scheme. With the implementation of design and control measures relating to dust and pollution prevention, and given the distance, impacts with the potential to result in significant effects are not predicted for the following designated sites (distance is from the Scoping Boundary):

- Willoughby Wood SSSI at 380 m west
- Candlesby Hill SSSI at 440 m northwest
- The Shrubberies LNR at 560 m northeast

- Willoughby Branch Line LNR at 580 m west
- Hoplands Wood SSSI at 950 m west
- Claxby Chalk Pit SSSI at 1.9 km west.

6.6.4 In addition, the Impact Risk Zones for the SSSIs that overlap with the Scoping Boundary do not identify underground cables as a type of development that could have an adverse effect. As such, these local and national statutory designated sites are proposed to be scoped out from further biodiversity assessment.

Likely Significant Effects

6.6.5 **Table 6-8** and **Table 6-9** detail a broad overview of potential impacts and effects to biodiversity during construction and operation of the Project, respectively, in the absence of additional mitigation (beyond design and control measures). These tables are not exhaustive. Further impacts and effects may be identified as the scheme design and construction methods are developed.

6.6.6 The tables also identify which impact and effect pathways are proposed to be scoped in and out of the assessment. Where effects are proposed to be scoped out, a justification for this outcome is provided.

Table 6-8: Potential Impacts on Biodiversity During Construction (including de-commissioning)

Activity / Potential Impact	Biodiversity Feature(s) Potentially Impacted	Potential for Significant Effects	Proposed to be scoped in / out
Permanent, long-term impacts			
Permanent habitat loss and/or degradation (any areas which will not be reinstated e.g. converter stations and substations)	Designated sites, HPI, ancient and veteran trees, and other habitats including waterbodies and species they support.	**Yes** – there is the potential for significant effects in the absence of further design and control or additional mitigation and compensation measures. • Permanent reduction in habitat. • Degradation (e.g. hydrological changes or indirect impacts) and fragmentation of adjacent remaining habitats. • Subsequent negative effects on species and populations which use them (due to e.g. impacts to feeding, commuting, resting, hibernating and breeding habitats).	**Scoped in**
Temporary habitat loss and/or degradation (if land not reinstated to same or better condition habitats)	Designated sites, HPI and other habitats including waterbodies and species they support.	**Yes** – there is the potential for significant effects in the absence of further design and control or additional mitigation measures. • Long-term degradation of habitats. • Long term negative effects on local species and populations.	**Scoped in**
Temporary, short to medium-term impacts			
Temporary habitat loss (land which will be reinstated to the same or better condition, post-construction)	Designated sites, HPI and other habitats including waterbodies.	**Yes** – there is the potential for significant effects in the absence of further design and control or additional mitigation measures. • Temporary (short or medium-term) loss and/or degradation of habitats and subsequent negative effects on species which use them.	**Scoped in**

Activity / Potential Impact	Biodiversity Feature(s) Potentially Impacted	Potential for Significant Effects	Proposed to be scoped in / out
Vegetation clearance during construction	Protected and/or notable species.	**Yes** – there is the potential for significant effects in the absence of further design and control or additional mitigation and compensation measures. • Killing and injuring individuals or populations. • Damage / destruction to commuting, foraging, sheltering, resting or breeding habitats. Potential fragmentation and severance effects.	**Scoped in**
Terrestrial and aquatic habitat severance	Protected and/or notable species.	**Yes** – there is the potential for significant effects associated with fragmentation of populations in the absence of further design and control or additional mitigation and compensation measures.	**Scoped in**
Noise, vibration, dust, pollutants, vehicle collisions and artificial lighting during site clearance	Protected and / or notable species and the habitats which support them.	**Yes** – there is the potential for significant effects in the absence of further design and control or additional mitigation measures. • Degradation of habitats (short or longer term) supporting species. • Injury / displacement / fragmentation / disturbance / reduced survival and breeding success of species and resulting negative effects on local populations.	**Scoped in**
Increased nitrogen deposition and/or ammonia concentrations from vehicular traffic	Designated sites and ancient woodland habitats	**Yes** – there is the potential for significant effects in the absence of further design and control or additional mitigation measures. • Habitat degradation or damage (including toxicity from ammonia), species composition changes, physiological response from floral species	**Scoped in**

Table 6-9: Potential Impacts on Biodiversity During Operation

Activity / Potential Impact	Biodiversity Feature(s) Potentially Impacted	Potential for Significant Effects	Proposed to be scoped in / out
Maintenance activities. Lighting, noise, dust, pollutants, vehicle collisions	Protected and / or notable species and the habitats which support them	**No** – given the temporary, short-term and localised nature of any maintenance activities, these are not predicted to give rise to significant effects.	**Scoped out**
Increased nitrogen deposition and/or ammonia concentrations from operational/maintenance vehicular traffic	Designated sites and ancient woodland habitats	**No** – as detailed within **Part 2, Chapter 14: Air Quality**, vehicle trips associated with the operation and maintenance phase are anticipated to be below screening criteria and therefore impacts are considered to be non-significant.	**Scoped out**
Artificial lighting and noise associated with permanent infrastructure e.g. converter stations and the new Walpole substation	Protected and/or notable species	**Yes** – there is the potential for significant effects associated with disturbance and dispersal of protected/notable species in the absence of further design and control or additional mitigation measures.	**Scoped in**
Works to the existing 400 kV overhead line – potential risk of bird strike/collision (mortality)	Birds	**No –** As the overhead line works at Walpole are to an existing overhead line route, the potential pressure to bird flight would remain the same as the existing baseline. Therefore, the English Onshore Scheme would not result in a significant effect.	**Scoped out**

6.7 Assessment Methodology

Further Data to be Gathered/ Processed

Desk-Based Assessments

6.7.1 Local ecological records (terrestrial and aquatic), maps and citations regarding local designated sites will be obtained within a buffer of 2 km from the preferred cable route (including land falls) and siting zones from relevant data holders such as ecological records centres, local species interest groups and the EA.

Ecological Surveys

6.7.2 The ecology surveys outlined in **Table 6-10** below are stage one assessments being considered to inform the design and mitigation for the English Onshore Scheme as well as the impact assessment.

6.7.3 The study area for ecology surveys will generally be 125 m either side of the preferred cable route creating a 250 m wide survey corridor. This corridor comprises a temporary working width for the underground cables/overhead line of up to 150 m (i.e. 75 m either side of the preferred cable route), plus a survey extension of 50 m either side. The general study area for the converter/substations will be the siting zone plus a 50 m buffer. The study area would be extended (as required) depending on the receptor, best practice survey guidelines and the potential ZoI of the English Onshore Scheme. The study areas shall also be reviewed as the English Onshore Scheme progress and further information becomes available, including the development of the likely working area.

6.7.4 As further details regarding construction methods are obtained, these surveys and methodologies can be refined and agreed with relevant stakeholders where required. The type and scale of habitats which will be impacted, and the programme of works, will influence survey requirements and effort, which is not yet known at this stage of the English Onshore Scheme. Survey and assessment methodologies will typically follow industry best practice guidance, unless bespoke methods or approaches are developed. Where deviation from best practice is proposed, this would be supported by a robust justification and, where possible, agreed with relevant stakeholders.

Table 6-10: Ecology Surveys

Survey / Ecological Receptor	Provisional scope and considerations
Habitats (including HPI and waterbodies)	• Preliminary Ecological Appraisal (PEA)/UK Habitat Classification (UKHab) survey – mapping habitats, including HPI and veteran/ancient trees (incidental observations of veteran/ancient trees only, supplemented by the arboricultural assessment and survey, as detailed in **Volume 2, Appendix 6-A**). ○ Combination of walkover surveys by ecologists and use of drones, to survey areas where access has not been granted and to verify presence of arable farmland.

Survey / Ecological Receptor	Provisional scope and considerations
	• Hedgerow assessments to determine 'Important' hedgerows under The Hedgerow Regulations (1997) (Ref 6.8) (wildlife and biodiversity criteria only) • Aquatic habitat assessment (onshore aquatic habitat only).
Birds (wintering, breeding, passage and intertidal)	• Wintering, breeding, passage and intertidal bird surveys (single year of data collection). This would include walked transect surveys any may need to be timed to cover high and low tide survey periods, particularly for any intertidal areas.
Bats	• Bat ground level tree assessments (roosting suitability). Subsequent tree climbing and/or nocturnal emergence surveys as required where roosts may be impacted. • Bat activity assessment requirements have not yet been determined.
Badgers	• Daytime walkover for signs of badger activity and any active setts. Where setts are identified, further camera trap and other surveys may be required.
Otter & water vole	• Single survey (combined otter and water vole survey) to determine potentially suitable habitat and any signs of presence. Further surveys may be required following this initial survey.
Natterjack toad	• Habitat suitability assessment and population surveys, as required, associated with the Theddlethorpe landfall option (natterjack toad a qualifying species of the Saltfleetby-Theddlethorpe Dunes SSSI at this location).
Great crested newt	• The approach to great crested newt assessment has not yet been finalised but may include initial walkovers to scope suitable waterbodies, Habitat Suitability Index (HSI) scoring and eDNA and/or presence/likely absence surveys.
Other amphibians including toads	• Targeted surveys unlikely to be required and precautionary measures during construction will be implemented to safeguard these species.
Reptiles	• Targeted surveys unlikely to be required and precautionary measures during construction will be implemented to safeguard these species. However, depending on the scale and longevity of potential reptile habitat loss, targeted reptile surveys may be required.
Brown hare	• Targeted surveys not proposed and precautionary measures during construction will be implemented to safeguard these species.
Hedgehog	• Targeted surveys not proposed and precautionary measures during construction will be implemented to safeguard these species.
Invertebrates (terrestrial and aquatic)	• Requirement for any terrestrial invertebrate survey will be determined following the PEA and further assessment, depending on habitat suitability, extent and potential impacts.

Survey / Ecological Receptor	Provisional scope and considerations
	• Macroinvertebrate surveys of suitable waterbodies will be determined during the aquatic habitat assessment.
Fish	• Fish surveys of main rivers/watercourses and at targeted suitable habitats within the zone of influence; determined during the aquatic habitat assessment.
Notable terrestrial or aquatic plant species (including invasive, non-native species)	• Requirement for any notable terrestrial or aquatic plant species (including invasive, non-native species) targeted survey will be determined during the PEA. If targeted surveys are required, these will likely be covered by mitigation measures during construction, likely to include a pre-commencement survey to map out affected areas with a targeted mitigation approach adopted, designed by a specialist Construction Contractor.

Ecological Impact Assessment

6.7.5 Following a series of detailed desk and field based ecological assessments, an Ecological Impact Assessment (EcIA) will be undertaken to assess the potential impacts of the English Onshore Scheme on biodiversity, once all impact avoidance and mitigation measures have been agreed.

Important Ecological Features (IEF)

6.7.6 In accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) EcIA Guidelines (Ref 6.21), a number of characteristics contribute to the importance of ecological features (IEFs). These include for example (but not exclusively): the rarity of a species or habitat, legal protection/conservation status, ability to resist or recover from environmental change and uniqueness of an ecological feature, whether the species population size is notable in a wider context, the richness of assemblages of plants and animals and the presence of species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

6.7.7 The nature conservation importance of an ecological feature is represented on a geographic scale, in **Table 6-11** below:

Table 6-11: Defining Importance of Ecological Features

Geographic Context of Importance	Criteria
International or European	• European Sites including SPA and SAC. • Ramsar sites (designated under international convention) and proposed Ramsar sites are also considered in the same manner in accordance with national planning policy. • Areas of habitat or populations of species which meet the published selection criteria for designation as a European Site based

Geographic Context of Importance	Criteria
	on discussions with Natural England and field data collected to inform the impact assessment, but which are not themselves currently designated at this level.
National (relating to the UK, specifically England)	• A nationally designated site including SSSI and NNR. • Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated based on field data collected to inform the impact assessment, and in agreement with Natural England. • SPI and HPI, Red listed and legally protected or notable species that are not addressed directly in Part 2 of the "Guidelines for Selection of Biological SSSIs" (Ref 6.28) but can be determined to be of national importance using the principles described in Part 1 of the guidance. • Areas of Ancient Woodland, for example woodland listed within the Ancient Woodland Inventory (Ref 6.25) and ancient and veteran trees.
Regional (East Midlands, East of England)	• Regularly occurring HPI or populations of SPI, Red listed and legally protected or notable species may be of regional importance in the context of published information on population size and distribution.
County (e.g. Lincolnshire, Norfolk, Cambridgeshire)	• LNR and non-statutory designated sites including: LWS. Areas which, based on field data collected to inform the impact assessment, meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans) but which are not themselves designated.
Local (towns, local country area e.g. Fenlands)	• HPI and SPI, Red listed and legally protected or notable species that based on their extent, population size, quality etc are determined to be at a lesser level of importance than the geographic contexts above.

Geographic Context of Importance	Criteria
	• Common and widespread semi-natural habitats occurring within the study area in proportions greater than may be expected in the local context. • Common and widespread native species occurring within the study area in numbers greater than may be expected in the local context.
Negligible	• Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area. • Areas of heavily modified or managed land uses (for example, hard standing used for car parking, as roads etc.)

6.7.8 Assigning importance to ecological features is based on professional judgement informed by available guidance and information along with expert advice. CIEEM's EcIA guidelines state that only ecological features which are important and potentially affected by a scheme should be subject to detailed evaluation. For the purposes of this assessment, ecological features of 'Local' importance or higher are assessed as being IEFs and therefore considered with regards to the significance of effects. Ecological features of 'Site' importance or below are not considered sufficiently important to experience significant effects and are not assessed as being IEFs.

Scope of Ecological Impact Assessment (EcIA)

6.7.9 The EcIA will consider the potential effects of the English Onshore Scheme upon IEFs identified during the baseline survey and data collection, in accordance with the CIEEM EcIA Guidelines (Ref 6.21). This requires the identification of pathways available for an impact, either directly or indirectly, to result in a potential significant effect to the habitat and/or species. IEFs may be located within areas directly impacted by the English Onshore Scheme or the wider areas surrounding this (the 'zone of influence').

Identification and Characterisation of Potential Impacts

6.7.10 The potential impacts of the English Onshore Scheme during construction and operation and the potential ecological effects arising from them will be identified and characterised, taking into consideration the following parameters:

- Beneficial or adverse - whether the impact will result in net loss or degradation of an important ecological feature or whether it will enhance or improve it.
- Extent - the spatial area over which an impact occurs.
- Magnitude - the size or intensity of the impact measured in relevant terms, e.g., number of individuals lost or gained, area of habitat lost or created or the degree of change to existing conditions (e.g., noise or lighting levels).

- Duration - the length of time over which the impact occurs. The duration of the impacts will be described as either ‘short-term’, ‘medium-term’ or ‘long-term’. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.
- Reversibility - the extent to which impacts are reversible either through natural regeneration and succession or through active mitigation.
- Timing and frequency - consideration of the timing of events in relation to ecological change, for example, some impacts may be of greater magnitude if they take place at certain times of year (e.g., breeding season). The extent (see above) to which an impact is repeated may also be of importance.
- Impacts on IEFs can be permanent or temporary, direct or indirect, and can be cumulative. These factors are brought together to assess the potential impact on the integrity or conservation status of a particularly important ecological feature.

6.7.11 Potential impacts are characterised initially in the absence of any mitigation, except where this is integral to the design of the English Onshore Scheme (design measures).

6.7.12 Collaboration and data exchange with other relevant disciplines such as air quality and arboriculture will be carried out to further inform the EcIA and assessment of potential impacts.

Assessment of Cumulative Impacts and Effects

6.7.13 Other projects or proposals which are due to occur within the same ZoI and within similar timeframes as the English Onshore Scheme have the potential to results in cumulative effects on biodiversity and therefore the impacts of any relevant projects or proposals will be considered in combination with the English Onshore Scheme.

Assigning Significance

6.7.14 Having characterised importance and potential impacts, the significance of the predicted effects on IEFs arising will be assessed. The assessment of likely significant effects as a result of the English Onshore Scheme will be considered for both the construction and operational phases.

6.7.15 The CIEEM EcIA guidelines (Ref 6.21) define a significant effect in the context of an Ecological Impact Assessment as “*an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general*”. Significant effects, as defined by the CIEEM EcIA guidelines, are determined by assessing any deviation in the baseline conditions of a feature of ecological importance that may occur because of individual and cumulative impacts during the construction and operational phases of a development.

6.7.16 These effects will be expressed in terms of geographical scale, using the same scale detailed above, to define the importance of an ecological feature. The geographical scale at which an effect is significant can vary from the geographical importance of the ecological feature being assessed and in accordance with the CIEEM EcIA guidelines, this will be a function of the assessment. For this assessment, effects at a Local scale or higher are defined as “significant”.

6.7.17 Where a potential significant effect is identified, proposals for mitigation and compensation would be made with the aim of avoiding, preventing, reducing or, if possible, offsetting any identified significant adverse effects. Following the application of

mitigation and compensation, the effects are reassessed to determine the residual effect.

Other Biodiversity Assessments

6.7.18 A HRA will be undertaken as a separate exercise to the EIA, to consider any likely significant effects on international designated sites, as well as a BNG assessment.

6.8 Assessment Limitations and Assumptions

6.8.1 As detailed in **Paragraph 6.1.5** above, at this early stage in the English Onshore Scheme, only limited desk-based information has been used for this scoping chapter and no data is yet available from field surveys to inform the Scoping Report. This factor has been considered and has influenced the assessment presented. As such, where necessary, a precautionary approach has been taken. Species and/or likely significant effects have been scoped in where insufficient information is available at this early stage to scope out these out.

6.8.2 In addition, the scope of ecological surveys detailed above in Section 6.8 is also precautionary. Ecological receptors, survey effort and potential for likely significant effects shall be reviewed as the English Onshore Scheme progress and further information becomes available.

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7. Cultural Heritage

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7. Cultural Heritage

7.1 Introduction

7.1.1 The cultural heritage assessment will consider the potentially significant effects on heritage receptors that may arise from the construction and operation of the English Onshore Scheme.

7.1.2 This chapter of the Scoping Report sets out the relevant legislation, planning policy context and technical guidance used to inform the scope of the assessment and summarises any consultation and engagement in relation to cultural undertaken to date. It provides an overview of the baseline conditions relevant to cultural heritage within and around the Scoping Boundary, the measures which will be incorporated into the English Onshore Scheme to mitigate cultural heritage effects, the likely significant effects to be considered within the assessment, and how these likely significant effects will be assessed for the purpose of an EIA.

7.1.3 This chapter should be read in conjunction and considered alongside the following chapters found in Volume 1:

- **Part 2, Chapter 4: English Onshore Scheme**
- **Part 2, Chapter 5: EIA Methodology**
- **Part 2, Chapter 6: Biodiversity**
- **Part 2, Chapter 8: Landscape and Visual Amenity**
- **Part 2, Chapter 13: Noise and Vibration**
- **Part 3, Chapter 31: Marine Archaeology**
- **Part 4, Chapter 35: Cumulative Effects.**

7.1.4 This chapter is supported by the following figures:

- **Figure 7.1: Cultural Heritage Study Area and Zones**
- **Figure 7.2: Cultural Heritage Extended Study Areas and Designated Heritage** Assets

7.1.5 This scoping assessment is a high-level desk-based appraisal and has not included a review of a full range of resources (e.g. documentary, cartographic, aerial photography, and geotechnical, architectural, and engineering sources) that would normally be consulted in a full desk-based assessment for an application for consent.

7.2 Relevant Legislation, Planning Policy and Technical Guidance

7.2.1 This section identifies the relevant legislation, national and local policy and guidance which has informed the scope of the cultural heritage assessment.

Legislation

7.2.2 A summary of the key legislation considered, but not limited to, in the scope of cultural heritage effects is outlined in **Table 7-1**.

Table 7-1: Legislation relevant to Cultural Heritage

Legislation	Legislative Context	Section Considered
Ancient Monument and Archaeological Areas Act (1979) (Ref 7.1)	This Act sets out that sites considered to be of national importance are required to be compiled in a Schedule of Monuments. These sites are accorded statutory protection. The Act sets out conditions whereby Scheduled Monument Consent is required. This Act also provides for the designation of Areas of Archaeological Interest in which statutory provisions for access to construction sites for carrying out archaeological works apply.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of the assessment Section 7.7 - Assessment methodology
Planning (Listed Buildings and Conservation Areas) Act (1990) (Ref 7.2)	This Act covers the registration of listed buildings (buildings that are seen to be of special architectural or historic interest) and the designation of conservation areas (areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance). It sets out the conditions under which a listed building consent would be required. The Act sets out at Sections 66 and Section 72 the duties of Local Planning Authorities (LPAs) to give great weight to the desirability of preserving listed buildings and their settings and the character of conservation areas in planning decisions. The Section 66 and Section 72 duties are superseded in applications under the Planning Act 2008 by equivalent provisions in the Infrastructure Planning (Decisions) Regulations 2010 (see below).	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment methodology
Historic Buildings and Ancient Monuments Act (1953) (Ref 7.3)	Under section 8C of the Historic Buildings and Ancient Monuments Act 1953, Historic England compiles a register of gardens and other land situated in England and appearing to them to be of special historic interest.	Section 7.4 - Baseline conditions Section 7.7 - Assessment Methodology
Infrastructure Planning (Decisions) Regulations (2010) (Ref 7.4)	These regulations require decision-makers to have regard to the desirability of preserving a Scheduled Monument or its setting; listed buildings, any features which contribute to their special interest and their	Section 7.4 - Baseline conditions Section 7.6 - Scope of Assessment

Legislation	Legislative Context	Section Considered
	settings and to have regard for the desirability of preserving the character and appearance of conservation areas. These duties supersede sections 66 and 72 of the Planning Act (Listed Buildings and Conservation Areas) 1990 in determining DCO applications.	Section 7.7 - Assessment methodology
Treasure Act (1996) (Ref 7.5)	This Act defines what constitutes “treasure”. Any find of “treasure” must be reported to the local Coroner.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
Treasure (Designation) Order (2002) (Ref 7.6)	This Order amends the statutory definition of “treasure”.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
The Treasure (Designation) (Amendment) Order (2023) (Ref 7.7)	This Order amends the Treasure (Designation) Order 2002 to include an additional class of objects within the definition of treasure in section 1(1) of the Treasure Act 1996 (c. 24), and to exclude two classes of objects from that definition.	Section 7.7 - Assessment Methodology
The Hedgerows Regulations (1997) (Ref 7.8)	These regulations set out criteria to be used to determine the importance of hedgerows and protect important hedgerows from removal. Selection criteria include heritage-based considerations.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
Burial Act (1857) (Ref 7.9)	This Act states that it is generally an offence to remove human remains from a place of burial without a licence from the Secretary of State.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
Protection of Military Remains Act (1986) (Ref 7.10)	This Act sets out specific protections for aircraft which have crashed or vessels which have sunk or been stranded whilst in	Section 7.4 - Baseline Conditions

Legislation	Legislative Context	Section Considered
	military service. It sets out a general prohibition on any disturbance or removal of such remains without a licence granted by the Secretary of State.	Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology

Planning Policy

7.2.3 A summary of the planning policies at both a national and local level relevant to the scope of cultural heritage effects is given in **Table 7-2** and **Table 7-3**.

Table 7-2: Planning Policy relevant to Cultural Heritage

Policy Reference	Policy Context	Section Considered
National Policy		
Overarching National Policy Statement for Energy (EN-1) (2024) (Ref 7.11)		
Section 5.9, paragraphs 5.9.12, 5.9.17-5.9.21.	Requires change to the significance of heritage assets to be considered in developing an understanding of the potential effects of the proposed development. It recommends conditions for refusal due to substantial harm and sets out criteria for this.	Section 7.4 – Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
Overarching National Policy Statement for Electricity Networks Infrastructure (EN-5) (2024) (Ref 7.12)		
Section 2.9, paragraphs 2.9.19, 2.9.25.	Requires that applicants should seek to avoid altogether internationally and national designated areas of cultural value, which includes all historic sites with statutory protection. Development of underground cables should consider the potentially very disruptive effects on archaeological and historical assets.	Section 7.4- Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
National Planning Policy Framework (NPPF) (2023) (Ref 7.12)		
Section 16	Paragraphs 195-214 relate to the historic environment and its sustainable management with regards to proposed development. It defines heritage assets and why they should be conserved.	Section 7.7 - Assessment Methodology

Table 7-3: Local Planning Policy relevant to Cultural Heritage

Policy Reference	Policy Context	Section Considered
Local Policy		
South East Lincolnshire Local Plan 2011-2036 (Adopted March 2019) (Ref 7.13)		
Policy 29: The Historic Environment	Distinctive elements of the South East Lincolnshire historic environment will be conserved and, where appropriate, enhanced. Opportunities to identify a heritage asset's contribution to the economy, tourism, education and the local community will be utilised including: • The historic archaeological and drainage landscape of the Fens. • The distinctive character of South East Lincolnshire market towns and villages. • The dominance within the landscape of church towers, spires and historic windmills. To respect the historical legacy, varied character and appearance of South East Lincolnshire's historic environment, development proposals will conserve and enhance the character and appearance of designated and non-designated heritage assets, such as important known archaeology or that found during development, historic buildings, conservation areas, scheduled monuments, street patterns, streetscapes, landscapes, parks (including Registered Parks and Gardens), river frontages, structures and their settings through high-quality sensitive design.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
East Lindsey Local Plan Core Strategy (Adopted July 2018) (Ref 7.14)		
Strategic Policy 11 (SP11) – Historic Environment	The Council will support proposals that secure the continued protection and enhancement of heritage assets in East Lindsey, contribute to the wider vitality and regeneration of the areas in which they are located and reinforce a strong sense of place.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology

Policy Reference	Policy Context	Section Considered
	Proposals will be supported where they: • Preserve or enhance heritage assets and their setting. • Preserve or enhance the special character, appearance and setting of the District's conservation areas. • Do not harm the site or setting of a scheduled monument; any unscheduled nationally important or locally significant archaeological site. • Are compatible with the significance of non-designated heritage assets in East Lindsey.	
Fenland Local Plan (May 2014) (Ref 7.15)		
Policy LP18 – The Historic Environment	All development proposals that would affect any designated or undesignated heritage asset will be required to: (a) describe and assess the significance of the asset and/or its setting to determine its architectural, historic or archaeological interest; and (b) identify the impact of the proposed works on the special character of the asset; and (c) provide a clear justification for the works, especially if these would harm the asset or its setting, so that the harm can be weighed against public benefits. The level of detail required should be proportionate to the asset's importance and sufficient to understand the potential impact of the proposal on its significance and/or setting. All development proposals that would affect a heritage asset will be determined in accordance with local policy in this Plan and national policy in the NPPF. Where permission is granted,	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology

Policy Reference	Policy Context	Section Considered
	a programme of work and/or the implementation of any necessary mitigation measures may be secured by condition or as part of a planning obligation in order to minimise any adverse impact.	
King's Lynn and West Norfolk Council Local Development Framework - Core Strategy (Adopted July 2011) (Ref 7.16)		
Policy CS07 Development in Coastal Areas	The Council will protect and enhance the cultural heritage qualities of the coast including designated and undesignated archaeological assets.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology
Policy CS12 Environmental Assets	The historic and built environment play a crucial role in delivering environmental quality and well-being. Therefore, the Council will preserve and where appropriate enhance its qualities and characteristics.	Section 7.4 - Baseline Conditions Section 7.6 - Scope of Assessment Section 7.7 - Assessment Methodology

Technical Guidance

7.2.4 A summary of the relevant guidance, specific to the cultural heritage assessment, that has informed this Scoping Report and will inform the assessment within the PEIR and ES, is given in **Table 7-4.**

Table 7-4: Technical Guidance relevant to Cultural Heritage

Technical Guidance Document	Context
Planning Practice Guidance: Historic Environment (2019) (Ref 7.17)	This guidance provides advice on the conservation and enhancement of cultural heritage.
Historic England Good Practice Advice in Planning Note 2 (GPA 2): Managing Significance in decision-taking in the Historic Environment (2015) (Ref 7.18)	This document provides guidance and information to assist in implementing cultural heritage policy and ensuring compliance with NPPF fundamentals.
Historic England Good Practice Advice in Planning Note 3 (GPA 3): The Setting of Heritage Assets (2017) (Ref 7.19)	Sets out guidance on managing change within the settings of heritage assets. The document sets out five steps to follow to ensure an appropriate level of assessment is achieved.

Technical Guidance Document	Context
Chartered Institute for Archaeology (2021) Principles of Cultural Heritage Impact Assessment in the UK (Ref 7.20)	This document provides guidance for cultural heritage practitioners in regard to the principles of cultural heritage impact assessments. These are: A. understanding cultural heritage assets; and B. evaluating the consequences of change.
Institute of Environmental Management and Assessment (IEMA) (2020) Impact Assessment Guidance (Ref 7.21)	Sets out key principles and direction to ensure that environmental mitigation identified during the pre-application assessment process (including design and EIA) is delivered once consent has been granted.
Statements of Heritage Significance: Analysing Significance in Heritage Assets (2019) (Ref 7.22)	This Historic England advice note covers the NPPF requirement for applicants for heritage and other consents to describe heritage significance to help local planning authorities to make decisions on the impact of proposals for change to heritage assets.
Chartered Institute for Archaeologists (CIfA) Standard and guidance for archaeological desk-based assessment (2020a) (Ref 7.23)	Sets out standards to produce archaeological desk-based assessments.
CIfA Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (2020b) (Ref 7.24)	Sets out standards for the provision of consultancy advice in the historic environment.

7.3 Consultation and Engagement

7.3.1 Introductory meetings have been held with Historic England and relevant Local Planning Authority (LPA) archaeological advisors and conservation officers to provide an introduction to the English Onshore Scheme.

7.3.2 Further consultation with Historic England and the relevant LPA archaeologists and Conservation Officers will be undertaken at two key points during the preparation of the application for development consent:

- In advance of the PEIR, to clarify and confirm requirements following the receipt of the Scoping Opinion and to agree the final scope of the assessment; and
- During preparation of the ES, to discuss any comments raised during the statutory consultation to ensure any necessary amendments can be incorporated.

7.3.3 Engagement with key stakeholder will be ongoing up to the submission of the DCO to ensure agreement of the approach to the assessment.

7.4 Baseline Conditions

Study Area

7.4.1 The study area for the assessment of effects on cultural heritage has been defined through consideration of the nature of the English Onshore Scheme, which are principally underground cable and above ground elements comprising a substation, converter stations and a DCSS. The study area extends 500 m from the Scoping Boundary, within which all the elements will be located. This is deemed to be an appropriate distance from the Scoping Boundary to describe the historical and archaeological baseline, and to undertake an assessment of archaeological potential. For the documents required for the DCO, the study area will extend 500m from the cable route, Walpole Station area and the LCS Converter Station Area.

7.4.2 Given the dimensions and characteristics of the operational above ground elements of the English Onshore Scheme, an Extended study area extending 3 km from the LCS Converter Station Area and the Walpole Station Area has been defined to identify receptors which may be impacted through change to setting. However, focus will be on assets where the setting contributes to their significance. Any assets outside of the study areas which have a setting that extends within it will also be considered. In this event, the Extended study area will be reviewed and updated accordingly.

7.4.3 The study area and Extended study area are shown on **Figure 7.1: Cultural Heritage Study Area and Zones**.

7.4.4 Consultation with stakeholders will be undertaken to identify assets outside the Extended study area whose significance may be affected, and these will then be included within the assessment.

7.4.5 The study areas will be reviewed and amended in response to any refinement of the English Onshore Scheme; desk and site-based analysis, including the development of a Zone of Theoretical Visibility (ZTV); the identification of additional impact pathways; and through ongoing consultation.

7.4.6 The English Onshore Scheme traverse two National Character Areas (NCAs); the Lincolnshire Coast and Marshes NCA and The Fens NCA. The NCAs, along with the Lincolnshire Landscape Character Areas, which subdivide the NCAs, broadly define particular landscape types and types of heritage assets and archaeological remains. From these units, the study area has been subdivided into three distinct zones for the purpose of developing the cultural heritage baseline and the assessment of archaeological potential. These are:

- Zone 1: Lincolnshire Coast and Marshes;
- Zone 2: The Eastern Fens; and
- Zone 3: Townlands and Reclaimed Wash Farmlands.

7.4.7 These zones are depicted on **Figure 7.1: Cultural Heritage Study Area and Zones.**

7.4.8 The Scoping Boundary has been subdivided into eight underground cable sections, two Landfall Areas, the LCS Converter Station Area, and the Walpole Station Area. These are described in **Part 2, Chapter 4: English Onshore Scheme, Section 4.4** and depicted on **Figure 1.7 English Onshore Scheme Scoping Boundary**. These areas fall within the following Zones:

- The landfalls at Theddlethorpe and Anderby Creek, the LCS Converter Station Area and cable Section 1: Landfalls – Bilsby, Section 2: Bilsby – Welton le Marsh and Section 3: Welton le Marsh – Little Steeping are broadly located within Zone 1: Lincolnshire Coast and Marshes;
- Section 4: Little Steeping – Sibsey Northlands and Section 5: Sibsey Northlands – Hubbert's Bridge are broadly within Zone 2: The Eastern Fens; and
- Section 6: Hubbert's Bridge – Moulton Seas End, Section 7: Moulton Seas End – Foul Anchor and Section 8: Foul Anchor - Walpole are broadly within Zone 3: Townlands and Reclaimed Wash Farmlands.
- **Figure 7.2: Cultural Heritage Extended Study Areas and Designated Heritage** Assets illustrates the designated heritage assets within the Extended study area.

Figure 7-1
Cultural Heritage Study Area and Zones

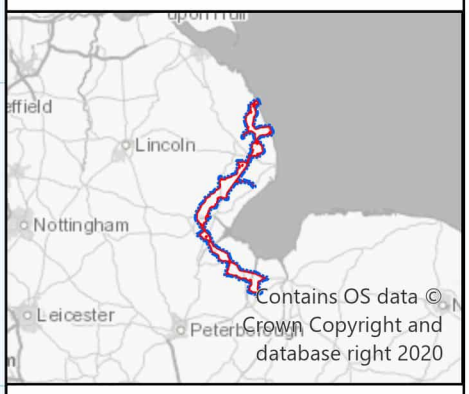
Legend

- Scoping Boundary
- 500m Study Area
- Cultural Heritage Zones

Zone 1: Lincolnshire Coast and Marshes

Zone 2: The Eastern Fens

Zone 3: Townfields and Reclaimed Wash Farmland



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Coordinate System: British National Grid
Sheet X Centroid Coordinate: 540239.88E Sheet Y Centroid Coordinate: 350760.07N

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Issue	Date	Remarks	Drawn	Checked	Approved
1	19/04/2024	DRAFT	NM	BS	DA

Title

Figure 7-1
Cultural Heritage Study Area and Zones

nationalgrid

Figure Number: Figure 7-1

Drawing Reference: EGL-WSP-CONS-XX-DR-G-010

Scale	Sheet Size	Sheet	Issue
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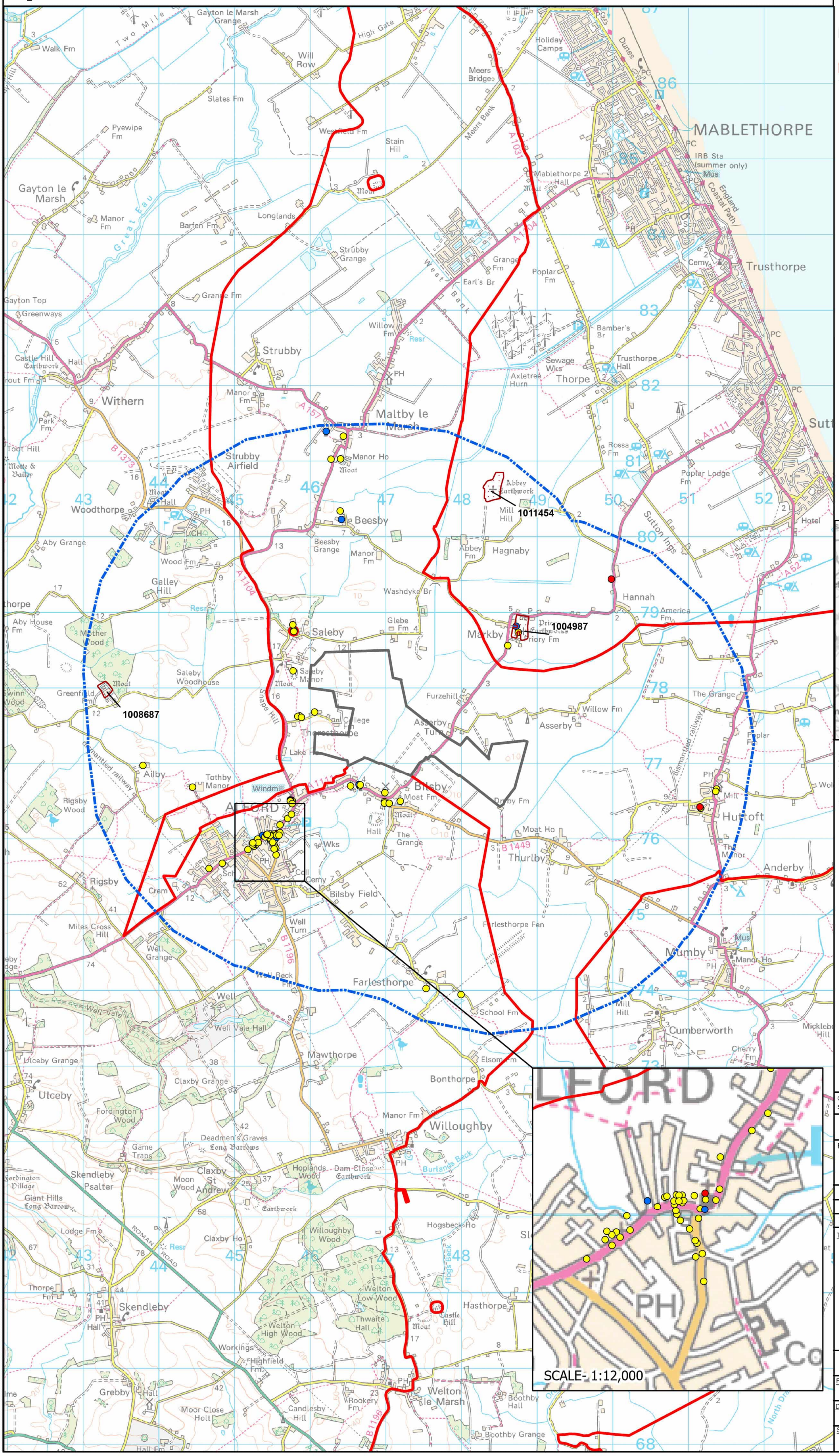
Figure 7.2
Cultural Heritage Extended Study Areas and Designated Heritage Assets



Legend

- Scoping Boundary
- Cultural Heritage Extended Study Area - 3km from Siting Zones
- Lincolnshire Connection Substations (LCS) Convertor Station and Direct Current Switching Station (DCSS) Preferred Siting Zone
- Scheduled Monument

Listed Buildings

- Grade I
- Grade II
- Grade II*

Notes

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Figure 7.2
Cultural Heritage Extended Study Areas
and
Designated Heritage Assets

nationalgrid

Figure Number	Drawing Reference	Scale	Sheet Size	Sheet	Issue
Figure 7-2	EGL-WSP-CONS-XX-DR-G-011	1:50,000	A3	SHEET 1 OF 2	1

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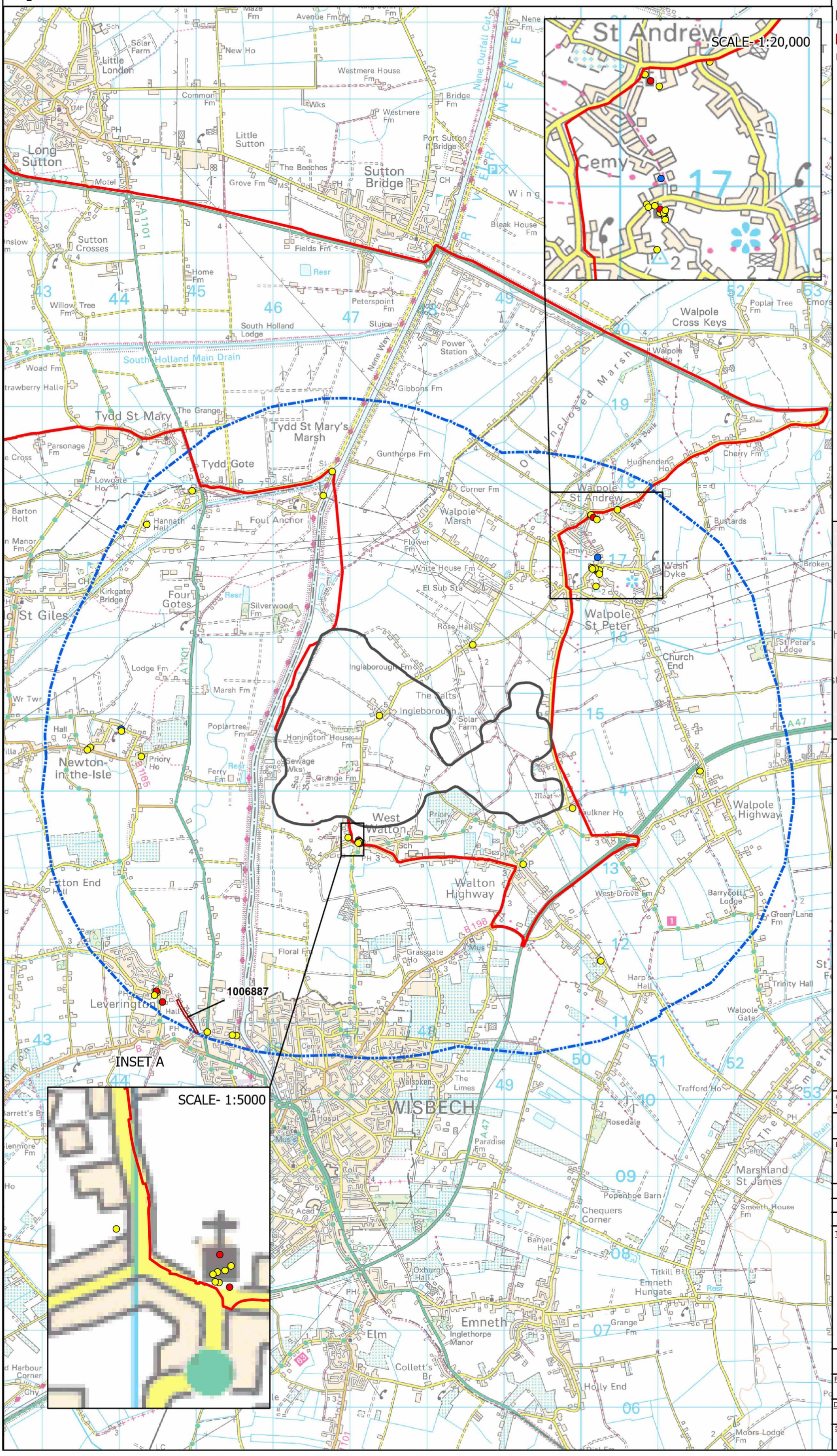
Figure 7.2
Cultural Heritage Extended Study Areas and Designated Heritage Assets



Legend

- Scoping Boundary
- Cultural Heritage Extended Study Area - 3km from Siting Zones
- Walpole Substation and Converter Stations Preferred Siting Zone
- Scheduled Monument

Listed Buildings

- Grade I
- Grade II*
- Grade II

Notes

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Issue	Date	Remarks	Drawn	Checked	Approved
1	30/04/2024	DRAFT	KD	BS	JB

Title

Figure 7.2
Cultural Heritage Extended Study Areas and Designated Heritage Assets

nationalgrid

Figure Number	Drawing Reference		
Figure 7-2	EGL-WSP-CONS-XX-DR-G-011		
Scale	**Sheet Size**	**Sheet**	**Issue**
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Data Gathering Methodology

7.4.9 For this Scoping Report, the cultural heritage baseline has been established through a review of:

- National Heritage List for England (NHLE);
- Lincolnshire Historic Environment Record (HER) data;
- Norfolk HER data;
- Historic England's dataset for Lincolnshire and Norfolk conservation areas data;
- Lincolnshire Landscape Character Areas;
- Norfolk Historic Landscape Characterisation;
- Regional Research Framework East Midlands: Updated Framework (2012) (Ref 7.25);
- Regional Research Framework East of England: Updated Framework (2021) (Ref 7.26);
- Historic Ordnance Survey (OS) mapping available online; and
- Historic England's Aerial Archaeology Mapping Explorer (Ref 7.27).

Current Baseline

7.4.10 The following sections describe the current baseline within Zones 1-3 of the study areas. Due to close proximity, some of the designated heritage assets discussed in the Extended study areas are also located within the study area relating to the Scoping Boundary.

Zone 1: Lincolnshire Coast and Marshes

Study Area

Designated Heritage Assets

7.4.11 There are no World Heritage Sites or Registered Battlefields within Zone 1 of the study area.

7.4.12 A total of 11 Scheduled Monuments are located within the study area for Zone 1. These comprise:

- Butterbump prehistoric round barrow cemetery (NHLE 1003615);
- Medieval moated sites (NHLE 1016045; NHLE 1017375);
- Ecclesiastical remains in the form of Markby Priory (NHLE 1004987) and Hagnaby Abbey (NHLE 1011454);
- Castle Hill motte castle (NHLE 1019173); and
- Churchyard crosses of medieval date (NHLE 1013532; 1014424; 1014425; 1014426; 1014939).

7.4.13 A total of 137 listed buildings are located within the study area for Zone 1. Of these, six are Grade I listed, which comprise four medieval churches, the 18th century Gunby Hall, and a 19th century windmill situated in Alford.

7.4.14 A further 17 listed buildings are Grade II* listed, with the remaining 114 Grade II listed. These are largely distributed in clusters within historic settlements such as Maltby-le-Marsh, Alford, and Candlesby.

7.4.15 There is one conservation area within the study area for Zone 1. This is Alford conservation area.

7.4.16 One Registered Park and Garden is situated within the study area for Zone 1, the Grade II listed Gunby Hall (NHLE 1000979).

Non-designated heritage assets

7.4.17 A total of 850 HER entries are located within the study area for Zone 1. These records comprise archaeological remains, historic structures and findspots of archaeological artefacts dating from early prehistory until the early modern period. Typical archaeological remains recorded include:

- find spots of prehistoric stonework implements;
- undated ditches and pits;
- medieval settlement remains;
- medieval and post-medieval ridge and furrow;
- post-medieval farm buildings;
- a former RAF base; and
- World War II (WWII) Aircraft obstructions.

7.4.18 A review of NCA, Landscape Character Areas, and historic mapping data shows that by the late 19th century the landscape in which Zone 1 of the study area is situated was largely comprised of historic field enclosures extending from historic settlements such as Theddlethorpe St Helen and Alford. This pattern is interspersed with smaller areas of later enclosure of former marsh.

7.4.19 Contained within the study area for Zone 1 is the Lincolnshire Coast and Marshes NCA, and the Lincolnshire Landscape Character Areas of The Mablethorpe Outmarsh, Spilsby Crescent, and The Middle Marsh. The Mablethorpe Outmarsh and Middle Marsh Landscape Character Areas are similar in character, containing a number of historic settlements with medieval origins established along 'islands' of high ground within what was at the time undrained marsh. Associated with the historic settlements are historic field enclosures which are long strip fields in the Mablethorpe Outmarsh and more irregular examples in the Middle Marsh. Both are suggestive of medieval origins. Historically, however, the predominant landscape type within these Landscape Character Areas was undrained marsh used for salt production and grazing which was subsequently drained in the 18th and 19th centuries for planned enclosure. Within this later landscape are interspersed isolated farmsteads.

7.4.20 The Spilsby Crescent Landscape Character Area intersects only a small portion of the study area for Zone 1 in the south. This Landscape Character Area is defined by historic settlements and field enclosures, which have probably developed from a medieval open

field system. A key characteristic in terms of the study area for Zone 1 is the presence of historic parkland, primarily in the form of Gunby Hall.

Extended Study Area

7.4.21 Within the Extended study area relating to LCS Converter Station Area there are five Scheduled Monuments:

- Markby Priory (NHLE 1004987);
- Site of St Mary's Priory, Greenfield (NHLE 1008687);
- Hagnaby Abbey (NHLE 1011454);
- Churchyard Cross, Holy Trinity Churchyard (NHLE 1014425); and
- Churchyard Cross, St Margaret's Churchyard, Saleby (NHLE 1014426).

7.4.22 A total of 83 listed buildings are located in the Extended study area relating to the LCS Converter Station Area. Of these, four are Grade I listed, three of which are churches and the fourth is the windmill situated in Alford. A further six are Grade II* listed, which comprise four churches and Hanby Hall. The remaining 73 listed buildings are Grade II listed, which represent a variety of historic structures including farmhouses, war memorials, buildings within historic settlements and school buildings. There is one conservation area within the Extended study area relating to the LCS Converter Station Area at Alford.

Zone 2: The Eastern Fens

Study Area

Designated Heritage Assets

7.4.23 There are no World Heritage Sites, Registered Parks and Gardens, or Registered Battlefields within the study area for Zone 2. There are two Scheduled Monuments within the TEF study area:

- Churchyard cross, St Margaret's Churchyard (NHLE 1010677); and
- Sibsey Trader Windmill (NHLE 1013828).

7.4.24 A total of 47 listed buildings are located with the study area for Zone 2. Of these, two are Grade I listed:

- Church of St Margaret (NHLE 1063533); and
- Sibsey Trader Mill (NHLE 1063535).

7.4.25 A further two listed buildings are Grade II* listed:

- Church of St Luke (NHLE 1063538); and
- The Cottage (NHLE 1223594).

7.4.26 The remaining 43 listed buildings are Grade II listed. These represent a range of historic structures including windmills, farmhouses and associated buildings, bridges, churches and war memorials.

Non-designated Heritage Assets

7.4.27 A total of 637 HER entries are recorded within the study area for Zone 2. These records are representative of human activity dating from early prehistory and the early modern period. Typical HER entries within the study area for Zone 2 include:

- Find spots of prehistoric stonework implements;
- Romano-British settlement and field systems;
- Find spots of Roman objects, including a coin hoard;
- Roman and medieval salt working remains;
- Medieval settlement remains and field systems;
- Post-medieval designed parkland;
- Post-medieval farmhouses and associated buildings; and
- 20th century war memorials.

7.4.28 Zone 2 is wholly located within The Fens NCA and the Landscape Character Area of the same name. A review of the NCA, Landscape Character Area information and historic mapping shows that by the late 19th century the landscape occupied by the study area for Zone 2 was largely enclosed former fen, punctuated by smaller areas of earlier enclosure close to historic settlements such as Little Steeping, Stickney and Sibsey.

Extended Study Area

7.4.29 The Extended study area is not applicable to this Zone.

Zone 3: Townlands and Reclaimed Wash Farmlands

Study Area

Designated Heritage Assets

7.4.30 There are no World Heritage Sites, Registered Battlefields or Registered Parks and Gardens within the study area for Zone 3.

7.4.31 There are three Scheduled Monuments within the study area for Zone 3:

- Shrunken medieval village, Algakirk (NHLE 1004933);
- Churchyard cross, All Saints' churchyard (NHLE 1010678); and
- White Cross, 80m north of Poultry Farm (NHLE 1014429).

7.4.32 A total of 147 listed buildings are located within the study area for Zone 3. Of these, 11 are Grade I listed, which are wholly associated with churches. A further four are Grade II* listed, which comprise a hydraulic engine house, two historic houses and a bridge. The remaining 132 listed buildings are Grade II listed. These comprise a variety of historic structures including milestones, farmhouses, bridges and war memorials.

Non-designated Heritage Assets

7.4.33 A total of 1,070 HER entries are recorded within the study area for Zone 3. Of these, 751 are derived from the Lincolnshire HER, with the remaining 319 taken from the Norfolk HER. These records represent a wide range of archaeological remains and historic structures dating from early prehistory to the early modern period. Typical HER entries within the Zone 3 study area include:

- find spots of prehistoric stone tools;
- Romano-British settlement and field system remains;
- early medieval pottery fragments;
- medieval settlement remains;
- medieval salt working sites;
- post-medieval farmhouses and associated buildings; and
- post-medieval historic parkland.

7.4.34 The Zone 3 is located within the Fens NCA and is sub-divided into primarily the Lincolnshire Landscape Character Areas of Townlands and Reclaimed Wash Farmlands, with small areas intersecting with Reclaimed Coastal Fringe and Cross Keys Wash Landscape Areas. The Townlands character area largely comprises enclosed arable agricultural land resulting from the gradual enclosure of medieval field systems in the post-medieval period, with subsequent boundary loss from the late 19th century onwards. Settlements in this area have origins in at least the medieval period, with varying levels of modern residential and industrial development extending from historic cores, such as Sutterton and Fleet Hargate.

7.4.35 The Reclaimed Wash Farmlands character area is primarily agricultural land, interspersed with large 18th and 19th century farmsteads.

7.4.36 The far south of Zone 3 is located within Norfolk, where the HLC within this area is recorded as largely agricultural land comprising enclosures of 19th-20th century date, with small areas of woodland, and modern development around the settlements of Walpole St Peter and West Walton.

Extended Study Area

7.4.37 Within the Extended study area for Walpole substation there are two Scheduled Monuments:

- Cherry Tree Hill round barrow (NHLE 1006781); and
- Ancient sea defence called Roman Bank (NHLE 1006887).

7.4.38 A total of 49 listed buildings are located within the Extended study area for the Walpole Substation Area. Of these, six are Grade I listed, which all relate to historic churches. A further two are Grade II* listed, which comprise an historic church and a manor farmhouse. The remaining 41 are Grade II listed, which largely relate to historic houses, tombs and war memorials. There are two conservation areas within this Extended study area, Tydd Gote and Leverington. There are no World Heritage Sites, Registered Battlefields or Registered Parks and Gardens within the Extended study area for Walpole Substation Area.

Future Baseline

7.4.39 At this stage, the future baseline for cultural heritage is based upon assumptions relating to types of development and activity that might reasonably be expected. Most of the study area is located within arable agricultural land and some degradation of extant earthworks and shallowly buried archaeological deposits may be expected to occur. Urban development extending from existing settlements close to the study area may also alter the baseline.

7.4.40 It is recognised that there are a number of other proposed and committed developments within the surrounding area, such as the proposed Grimsby to Walpole Project (the proposed overhead line for which partly overlaps with the English Onshore Scheme underground cable route) and the LCS Converter Station and Walpole Station that could alter the future baseline in the absence of the English Onshore Scheme. The potential for cumulative effects will be considered as part of the future EIA documents in accordance with the approach and guidance outlined within **Part 4, Chapter 35: Cumulative Effects**.

7.5 Design and Control Measures

7.5.1 As part of the English Onshore Scheme design process a number of design and control measures will be proposed to reduce the potential for impacts on cultural heritage receptors as the design is developed in further detail to avoid or minimise adverse effects on heritage assets.

7.5.2 Best practice measures regarding the design and finish of completed infrastructure and restoration of historic landscape features (e.g. hedgerows) will be considered within the assessment as appropriate and the influence of these measures would be considered in determining magnitude of change. Considerate construction practices aimed at reducing noise, dust, and visual intrusion of works in progress or minimising duration of construction and construction hours would also be considered within the assessment.

7.5.3 Where adverse effects to heritage assets cannot be avoided through design and control measures, secondary mitigation will be identified as part of the assessment process. It is anticipated that an overarching Project Design (formerly known as Written Scheme of Investigation (WSI)) would be produced and agreed with relevant consultees to set out a programme of archaeological investigation to mitigate effects to buried archaeological remains and built heritage. The scope of the project design would be agreed through the assessment process. Other additional measures will be identified as appropriate for mitigating effects to the settings of heritage assets.

7.6 Scope of the Assessment

Potential Sensitive Receptors

7.6.1 A list of cultural heritage receptors which may be subjected to potential significant effects caused by changes to setting has not been produced at this stage and will be done following the development of a ZTV and through formal and informal consultation and engagement with Historic England and the relevant LPA archaeological advisors and conservation officers.

7.6.2 In addition to effects on designated heritage assets, Historic England Good Practice Advice in Planning Note 3 (Ref 7.19) states that non-designated heritage assets can have settings which could be affected by a development. Consequently, a detailed

scope of non-designated heritage assets, including locally listed buildings where identified, will be set out and agreed with Historic England and LPA archaeological advisors and conservation officers.

7.6.3 Archaeological sites will also be subject to direct physical impacts during the installation of the English Onshore Scheme.

Likely Significant Effects

7.6.4 Likely significant cultural heritage effects which will be taken forward for assessment in the ES are summarised in **Table 7-5.**

Table 7-5: Likely Significant Cultural Heritage Effects

Development Phase	Impact	Receptor	Potential for Significant Effects	Proposed to be Scoped Out
Construction	Land preparation (earthworks, excavation)	Designated and non-designated heritage assets	**Yes** – potential effects from permanent loss of archaeological remains	Scoped in
		Historic Landscape Character	**Yes –** potential effects from loss of historic landscape elements	Scoped in
	Direct physical effects on heritage assets and archaeological remains outwith the footprint of the English Onshore Scheme permanent infrastructure.	Designated and non-designated heritage assets; historic landscape character	**No** – no physical disturbance, damage, or alteration would arise to heritage assets and archaeological remains located outside these areas in either the study area or Extended study area.	Scoped out
	Temporary effects during construction arising through change to setting	Designated and non-designated heritage assets; historic landscape character	**No** – temporary effects arising through change to setting during the construction phase are not deemed to be significant.	Scoped out
Operation	All above-ground infrastructure	Designated and non-designated heritage assets	**Yes** – potential for effects through change to setting caused during operation.	Scoped in

Development Phase	Impact	Receptor	Potential for Significant Effects	Proposed to be Scoped Out
		Historic Landscape Character	**Yes** – potential for effects from perceptual change to historic landscape.	Scoped in
	Land preparation	Designated and non-designated heritage assets	**No** – archaeological remains within the Scoping Boundary will have been removed, following appropriate mitigation, during the construction phase.	Scoped out
Maintenance	Repairs	Designated and non-designated heritage assets; historic landscape character.	**No** - archaeological remains within the Scoping Boundary will have been removed, following appropriate mitigation, during the construction phase.	Scoped out
Decommissioning	Demolition, excavation	Designated and non-designated heritage assets; historic landscape character.	**No** - archaeological remains within the Scoping Boundary will have been removed, following appropriate mitigation, during the construction phase.	Scoped out

Effects Scoped Out from Further Assessment

7.6.5 A number of potential effects have been scoped out from further assessment as these are considered not likely to be significant. These conclusions are based on the knowledge of the baseline environment, the nature of planned works, and the wealth of evidence on the potential for effects from similar projects more widely. The conclusions follow (in a site-based context) existing best practice.

7.6.6 The effects scoped out from further assessment in the ES are:

- Construction phase: direct physical effects on heritage assets and archaeological remains outwith the footprint of the English Onshore Scheme permanent infrastructure, which include construction areas and temporary construction accesses where identified. No physical disturbance, damage, or alteration would arise to heritage assets and archaeological remains located outside these areas in either the study area or Extended study area;
- Construction phase temporary effects arising through change to setting during the construction phase are not deemed to be significant;

- Operational phase: archaeological remains within the Scoping Boundary will have been removed, following appropriate mitigation, during the construction phase;
- Maintenance phase: archaeological remains within the Scoping Boundary will have been removed, following appropriate mitigation, during the construction phase; and
- Decommissioning phase: Archaeological remains within the Scoping Boundary will have been removed, following appropriate mitigation, during the construction phase.

7.7 Assessment Methodology

7.7.1 The proposed generic Project-wide approach to the assessment methodology is described in **Part 2**, **Chapter 5: EIA Approach and Methodology**, and specifically in **Section 5.3**. While this has informed the defined approach for cultural heritage, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the cultural heritage assessment in the ES.

Further Data to be Gathered/ Processed

7.7.2 To establish a detailed baseline as part of the EIA, a desk study and targeted site walkover will be completed. This will include:

- A review of desk-based data using the sources listed in **Paragraph 7.4.9**, along with the following:
  - A detailed interrogation of HER data for Cambridgeshire, Lincolnshire and Norfolk;
  - A review of locally listed buildings and conservation areas provided by the unitary authorities;
  - A review of the Portable Antiquities Scheme database;
  - Analysis of historic mapping;
  - Analysis of Environment Agency Light Detection And Ranging (LiDAR) and satellite imagery;
  - Analysis of British Geological Survey;
  - A review of the Historic England Peat Intertidal and Coastal Peat Database;
  - A review of The Fenland Survey;
  - Adherence to the Lincolnshire Archaeological Handbook;
  - A review of readily available local heritage data, such as Boston Borough Council's Parks and Special Historic Interest dataset; and
  - A review of readily available regional and local contextual studies.
- Targeted site walkovers of the English Onshore Scheme, including access routes and construction compound areas, and site visits to offsite heritage assets to inform assessment of effects arising from potential changes to setting.

7.7.3 Following completion of the desk study and site walkovers, and subject to consultation and the development of the English Onshore Scheme design, consideration will be given to the undertaking of:

- A desk-based geoarchaeological assessment and deposit model; and
- Archaeological evaluation of areas of medium to high archaeological potential likely to be directly impacted by construction activities. Evaluation may include non-intrusive geophysical survey and targeted intrusive survey through trial trenching. The archaeological evaluation programme would be agreed through consultation.

7.7.4 Where it is identified that there may be a potential significant effect on a heritage asset as a result of changes to its setting, baseline data will be collected on the setting of the asset and the degree to which this contributes to heritage significance, as set out in Historic England Good Practice Advice in Planning Note 3 (Ref 7.19). This will involve a visit to the asset in question, where access allows, as well as a review of representative viewpoints for the Landscape and Visual Impact Assessment (LVIA) where appropriate, and cross-referencing with the LVIA and other relevant workstreams to ensure an integrated approach to data gathering.

Assessment of Heritage Significance

7.7.5 The significance of a heritage asset is the product of the value it holds for this and future generations resulting from its historic, archaeological, architectural or artistic interests (Ref 7.11; Ref 7.18; Ref 7.20).

- Historical interest - through association with past events or past people; or where a heritage asset is illustrative of a particular asset type, theme, or period;
- Archaeological interest - through the potential to hold evidence about the past that can be retrieved through specialist investigation; and
- Architectural/Artistic interest - through value derived from contemporary appreciation of a heritage asset's aesthetics.

7.7.6 NPS EN-1 notes that setting contributes to a heritage asset's significance but does not provide an explicit definition of setting. Setting is defined in the NPPF and GPA3 as:

"*The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate an asset, or may be neutral.*"

7.7.7 For the purposes of the cultural heritage and archaeology assessment, the significance of an asset will be assigned to one of four classes, with reference to the heritage interests described above and professional judgement informed by policy and guidance (**Table 7-2, Table 7-3 and Table 7-4**). In particular, NPS EN-1 distinguishes between the heritage significance of designated and non-designated assets. To align with other workstreams in this assessment, significance is referred to as a receptor's 'heritage significance' in **Table 7-6.**

Table 7-6: Assessment of Heritage Significance

Significance	Heritage Asset Description
High	Scheduled monuments Grade I listed buildings Grade II* listed buildings Grade II listed buildings with exceptional qualities in fabric, historical association, and/or association/group value with heritage assets of high significance Protected wrecks Registered battlefield Conservation areas containing very important (Grade I / II*) listed buildings Grade I and II* registered parks and gardens Protected heritage landscapes (e.g. ancient woodland or historic hedgerows, heritage Sites of Special Scientific Interest) Burial grounds Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of national importance.
Medium	Grade II listed buildings which can be shown to have qualities in their fabric or historical association of regional importance only Conservation areas containing primarily Grade II listed or locally listed buildings Grade II registered parks and gardens Locally listed buildings Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of regional importance.
Low	Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of local importance.
Negligible	Item with no significant heritage value or interest
Uncertain	Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow significance to be determined.

Assessment of Magnitude of Change

7.7.8 Magnitude of change is a measure of the extent to which the heritage significance of an asset is affected, which can be influenced by several factors:

- the permanence of the impact (temporary, permanent, or reversible);
- physical changes caused by the impact (positive or negative); and
- the extent of the asset or its setting that would be affected and contribution of that part to its heritage significance.

7.7.9 Regarding buried archaeological deposits, where no remains are visible above ground, change would arise from direct disturbance or removal of archaeological material resulting in the loss of archaeological interest. In certain instances, elements of

architectural and historic interest can also be affected. Direct loss, damage or alteration of a structure would primarily affect architectural interest, although historic and archaeological interest may also be affected.

7.7.10 The effects of change within the setting of a heritage asset depends on the contribution of setting to the heritage significance of the asset, and assessments must be, by their nature, specific to the individual assets being considered. Heritage significance is a qualitative measure of value and any assessments of impact will be drawn from professional judgement exercised within a context defined by statute, policy and guidance.

7.7.11 All assessments will be presented as a narrative, setting out the nature and extent of the change to an asset's interests arising from the English Onshore Scheme, the permanence of change, and the impact, whether positive or negative, of those changes, before assigning those changes to a magnitude of change as set out in **Table 7-7.**

7.7.12 Change can be beneficial or adverse. NPS EN-1 expects developers to make, where possible, a positive contribution or beneficial impact to cultural heritage.

Table 7-7: Assessment of Magnitude of Change

Impact	Description
High	Change to most or all key archaeological materials or key elements of an historic building, such that the resource is totally altered. Comprehensive changes to setting.
Medium	Changes to many key archaeological materials or key historic building elements, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset.
Low	Changes to key archaeological materials or key historic building elements, such that the asset is slightly altered. Slight changes to setting.
Negligible	Very minor changes to archaeological materials or historic building elements, or setting.
No Change	No change.

Assessment of Significance of Effect

7.7.13 The classification of the significance of an impact is judged by the relationship of the magnitude of change to the assessed heritage significance of an asset (**Table 7-8**).

7.7.14 As a rule, major and moderate impacts are considered to be significant, while minor and negligible impacts are considered to be not significant. However, professional judgement will be applied, and this may be amended as appropriate.

7.7.15 All assessments will be presented as narrative descriptions that set out the significance of a heritage asset, including, where appropriate, the contribution of its setting to

significance, anticipated magnitude of change to significance, and a resulting significance for effect.

Table 7-8: Assessment of Significance of Effect

	Magnitude of Change			
Heritage Significance	**High**	**Medium**	**Low**	**Negligible**
High	Major (significant)	Major (significant)	Moderate (potentially significant)	Minor (not significant)
Medium	Major (significant)	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)
Low	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)	Negligible (not significant)
Negligible	Minor (not significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)

Assessment of Harm and Substantial Harm

7.7.16 Harm and substantial harm are distinguished in NPS EN-1. For this assessment, adverse change of negligible to medium magnitude to a designated asset or a non-designated asset of equivalent heritage significance would normally be considered as less than substantial harm, while a high magnitude of adverse change would normally be considered substantial harm. This follows the case of Hall vs City of Bradford 2019 (Ref 7.28) that determined that even a negligible magnitude of change to a designated heritage asset would constitute harm. The fact that the harm may be limited or negligible will contribute to the weight to be afforded to it as part of the planning balance as recognised in Paragraph 5.9.36 in NPS EN-1.

7.7.17 Professional judgement will be applied to the case of each individual asset and comments on the magnitude of any harm arising will be noted in the narrative of each assessment.

Cumulative Effects

7.7.18 There is also potential for cumulative impacts to occur on sensitive receptors arising from the English Onshore Scheme alongside other developments. In terms of cultural heritage, it is necessary to consider whether the effects of other developments in conjunction with the English Onshore Scheme will result in an additional cumulative change within the settings of heritage assets, beyond the levels predicted for the English Onshore Scheme alone. Cumulative effects may arise from the English Onshore Scheme alongside activities associated with other developments in the vicinity (see **Part 4, Chapter 35: Cumulative Effects**).

Potential Inter-related Effects

7.7.19 The assessment of potential inter-related effects will be considered within the Cultural Heritage and Archaeology Chapter of the ES. It will include consideration of the lifetime effects of the English Onshore Scheme and receptor-led effects, in line with the approach outlined in **Part 4, Chapter 35: Cumulative Effects** of this Scoping Report.

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