The Great Grid Upgrade

Sea Link

Preliminary Environmental Information Report

Volume: 1

Part 2 Suffolk Onshore Scheme

Chapter 1 Evolution of the Suffolk Onshore Scheme

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2.1 Evolution of the Suffolk Onshore Scheme

2.1.1 Introduction

2.1.1.1 The current stage of Sea Link (hereafter referred to as the Proposed Project) design is the result of an iterative process that commenced at project inception when the initial need to reinforce the network in the South East of England was identified in 2019.

2.1.1.2 **Volume 1, Part 1, Chapter 3, Main Alternatives Considered** describes National Grid Electricity Transmission plc (National Grid) approach to options appraisal and summarises both the strategic options that have been considered for the Proposed Project as well as the routeing and siting process. This chapter provides a more detailed summary of the routeing and siting appraisal and design evolution relevant to the evolution of the Suffolk Onshore Scheme from the selection of the preferred strategic option to the Suffolk Onshore Scheme Boundary as illustrated on **Figure 1.1.2 Suffolk Onshore Scheme Boundary**.

2.1.1.3 This chapter should be read in conjunction with:

- **Volume 1, Part 1, Chapter 3, Main Alternatives Considered**;
- **Volume 1, Part 1, Chapter 4 Description of the Proposed Project**;
- **Volume 1, Part 2, Chapter 1, Evolution of the Kent Onshore Scheme**; and
- **Volume 1, Part 4, Chapter 1, Evolution of the Offshore Scheme**.

2.1.1.4 This chapter is supported by the following figures:

- **Volume 3, Part 2, Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheets 1 to 4**;
- **Volume 3, Part 2, Figure 2.1.2 Suffolk Onshore Scheme Initial Preference – Routeing and Siting Stage;**
- **Volume 3, Part 2, Figure 2.1.3 Potential Coordinated Converter Station Sites – Routeing and Siting Stage;**
- **Volume 3, Part 2, Figure 2.1.4 Suffolk Site 1 Emerging Preference at Non-Statutory Consultation and EIA Scoping**;
- **Volume 3, Part 2, Figure 2.1.5 Suffolk Site 3 Emerging Preference at Non-Statutory Consultation and EIA Scoping**;
- **Volume 3, Part 2, Figure 2.1.6 Suffolk Site 1 Alternative at Non-Statutory Consultation and EIA Scoping**;
- **Volume 3, Part 2, Figure 2.1.7 Suffolk Site 3 Alternative (Option 1) at Non-Statutory Consultation and EIA Scoping**; and
- **Volume 3, Part 2, Figure 2.1.8 Suffolk Site 3 Alternative (Option 2) at Non-Statutory Consultation and EIA Scoping**;

- **Volume 3, Part 2, Figure 2.1.9 Evolution of the Suffolk Onshore Scheme HVAC Connection**;
- **Volume 3, Part 2, Figure 2.1.10 Evolution of the Suffolk Onshore Scheme Saxmundham Converter Station**; and
- **Volume 3, Part 2, Figure 2.1.11 Evolution of the Suffolk Onshore Scheme Underground HVDC Cables and Landfall**.

2.1.2 Summary of the Corridor and Preliminary Routeing and Siting Stage relevant to the Suffolk Onshore Scheme

2.1.2.1 The following sections provide a summary of the Corridor and Preliminary Routeing and Siting Study (CPRSS) (Ref 2.1.1) that is relevant to the evolution of the Suffolk Onshore Scheme

Network Connection Points

2.1.2.2 The preferred strategic option identified the Sizewell area as the area on the network the Proposed Project was required to connect, in order to meet the Needs Case as described in **Volume 1, Part 1, Chapter 1, Introduction** and as described in **Volume 1, Part 1, Chapter 3, Main Alternatives Considered**. Three potential points of connection were identified within the Sizewell area, and these were appraised as part of the routeing and siting appraisal. These connection points as illustrated on **Figure 1.3.4 Suffolk Network Connection Points** are:

- the existing Sizewell B substation or the new Sizewell C substation (which forms part of the proposed Sizewell C Nuclear Power Station Project)
- the proposed Friston substation (which forms part of the consented Scottish Power Renewables (SPR) East Anglia One North and East Anglia Two Offshore Wind Farm Projects), or
- a new connection point directly onto the existing 400 kV overhead lines within proximity to the Sizewell area.

2.1.2.3 These were used as the basis for defining the routeing and siting study area in Suffolk.

Study Area

2.1.2.4 The routeing and siting study area in Suffolk extended from Hollesley in the south to Dunwich in the north along the Suffolk coast, and, inland to Wickham Market. The routeing and siting study area is illustrated on **Figure 1.3.1 Routeing and Siting Study Area**.

Landfall Areas of Search

Areas of Search

2.1.2.5 Five landfall areas of search were initially identified in Suffolk. These are illustrated on **Figure 1.3.2 Suffolk Landfall Areas of Search**. The southernmost area of search (S1) was identified to the south of Aldeburgh, north of the Alde and Ore River. A second area of search was identified between Aldeburgh and Thorpeness (S2). A third area of search was identified between Thorpeness and Sizewell (S3). This area was further split down into two sub areas, south (S3) and north (S3N). A fourth area was identified at Sizewell (S4) and the northern most area of search was identified north of Sizewell, to the south of Minsmere (S5).

Summary of Appraisal Outcomes

Terrestrial constraints

2.1.2.6 All five landfall areas of search are within the Suffolk Coasts and Heaths Area of Outstanding Natural Beauty (AONB) which was unavoidable within the study area.

Landfall area of search S1

2.1.2.7 Landfall area of search S1 is located to the south of Aldeburgh and the north of the Alde and Ore River. The Alde and Ore River is located adjacent to the south of this landfall area of search and is designated as the Alde-Ore Estuary Ramsar, Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) and the Alde-Ore & Butley Estuaries Special Area of Conservation (SAC). These designations were avoidable within this landfall area of search however they would need to be crossed by any onward terrestrial routeing from this landfall. The whole of this landfall area of search is within Flood Zones 2 and 3 and construction within the flood zone could not be avoided. Access to this landfall area of search was also limited and would likely need to be taken through Aldeburgh.

Landfall area of search S2

2.1.2.8 Landfall area of search S2 is located to the north of Aldeburgh and south of Thorpeness. The whole of the landfall area of search is designated as Leiston – Aldeburgh SSSI and North Warren RSPB Reserve. These designations were unavoidable within this area of search, but the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) could be used to reduce potential significant effects. The majority of the landfall area of search is within Flood Zone 2 and 3, depending on the installation technique, these zones were considered potentially avoidable as trenchless techniques could be used to avoid working directly within Flood Zone 2 and 3.

Landfall area of search S3

2.1.2.9 Landfall area of search S3 stretches from Thorpeness in the south to Sizewell in the north and was broadly split into two, S3 in the south from Thorpeness to Beach View Holiday Park and S3N to the north of Beach View Holiday Park to Sizewell Gap Road. The whole of the intertidal area within S3 is designated as Leiston – Aldeburgh SSSI, however within this landfall area of search this designation is very narrow and likely to be avoidable with the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations). A section of North Warren RSPB Reserve is located in the south of this landfall area of search but was likely to be avoidable. S3N is wholly outside of the Leiston – Aldeburgh SSSI. There are small areas of Flood Zone 2 and 3 across both S3 and S3N but these areas are localised and were considered likely to be avoidable.

Landfall area of search S4

2.1.2.10 Landfall area of search S4 is located to the north of Sizewell Gap Road at Sizewell. There are no terrestrial designations for ecological conservation within the intertidal area however the landfall area of search was significantly constrained by the existing Sizewell B Nuclear Power Station.

Landfall area of search S5

2.1.2.11 Landfall area of search S5 is located to the north of existing Sizewell Nuclear Power Station and south of Minsmere New Cut drainage channel. The whole of the intertidal area and immediate terrestrial area is designated as Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve. These designated sites were unavoidable within this area of search but the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) could be used to reduce potential significant effects. A second crossing of the Minsmere to Walberswick Heaths & Marshes SSSI and Minsmere RSPB Reserve would also be required for any onward terrestrial routeing. The majority of this landfall area of search is within Flood Zones 2 and 3 and construction within the flood zone could not be avoided. Access to this landfall area of search was also very limited and likely to require a long temporary access road.

Summary of relevant marine alignments

2.1.2.12 Whilst the immediate offshore landfall area of search at S1 and S2 is outside of the Southern North Sea SAC all marine alignments to the landfall areas of search in Suffolk would need to cross both the Southern North Sea SAC and the Outer Thames Estuary SPA.

2.1.2.13 The marine approaches to both landfall area of search S1 and S2 were relatively unconstrainted.

2.1.2.14 The marine alignment to landfall area of search S3 was significantly constrained due to the presence of rocky reefs comprised of cemented limestone rich shells in the immediate offshore environment. This constraint is reduced at landfall S3N.

2.1.2.15 The marine alignments to landfall areas of search S4 and S5 were more constrained than the other options due to the additional number of offshore crossings that would be required and the potential for interaction with the proposed Sizewell C development.

Summary of appraisal outcomes

2.1.2.16 Landfall area of search S1 was relatively unconstrainted from a marine approach perspective but terrestrially had access and flood risk constraints and constraints associated with the onward terrestrial routeing.

2.1.2.17 Landfall area of search S2 was relatively unconstrainted from a marine approach perspective but terrestrially crosses a wide area designated as SSSI and RSPB reserve.

2.1.2.18 Landfall area S3 was significantly constrained from a marine approach perspective due to the presence of rocky reefs and, in the immediate offshore by the proposed export cable route from the proposed East Anglia One North and Two Offshore Wind Farm Projects. Onshore it was considered likely that the effects on the SSSI and RSPB reserve could be reduced through the use of trenchless installation techniques (subject to confirmation through further studies and ground investigations). Offshore the approach to landfall S3N was less constrained by the rocky reef but other existing and proposed offshore infrastructure on the approach still posed a constraint. Terrestrially, S3N was relatively unconstrained environmentally.

2.1.2.19 Landfall area of search S4 was significantly constrained both on the offshore approach and terrestrially by the presence of the existing Sizewell B Nuclear Power Station and the proposed Sizewell C Nuclear Power Station development.

2.1.2.20 Landfall area of search S5 was constrained on the marine approach by the large number of offshore cable crossings and the potential interaction with the proposed Sizewell C Nuclear Power Station development and onshore by both European and national designated sites for nature conservation.

2.1.2.21 These factors were considered when selecting the preferred option to take forward.

Converter Site Areas Considered

Areas

2.1.2.22 Nine converter site areas were identified within the routeing and siting study area. These were based on the need to be within approximately 5 km of the network connection point as explained in **Part 1, Chapter 3, Main Alternatives Considered**.

2.1.2.23 Due to there being a number of potential network connection points in the Sizewell area, converter site Areas were identified for each connection point, but some Areas provided a connection into more than one of the connection points. Table 2.1.1 lists the converter station Areas appraised for each connection point. A description of the Areas is provided below. The Areas are illustrated on **Figure 1.3.5 Suffolk Converter Site Areas**.

Table 2.1.1: Suffolk converter site Areas – connection points

Connection point	Converter site option areas
Existing and proposed Sizewell substations	A, B, C, D
Proposed Friston substation	B, C, D, E, F, G, H

Connection point	Converter site option areas
New substation along the existing 4Z overhead lines	B, E, F, H, I

Converter site Area A

2.1.2.24 Area A is located to the north of Kenton and Goose Hill, to the southeast of Eastbridge. The Area is wholly within the Suffolk Coast and Heaths AONB, but, it was identified as a potential Area, as it is close to the existing Sizewell B Nuclear Power Station and adjacent to the proposed Sizewell C Nuclear Power Station, therefore, providing an opportunity to keep energy infrastructure close together. The Area is adjacent to the Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve.

Converter site Area B

2.1.2.25 Area B is located to the east of Leiston and west of the existing Sizewell B Nuclear Power Station. The Area is wholly within the Suffolk Coast and Heaths AONB, but, was identified as a potential Area as is adjacent to the existing Sizewell B Nuclear Power Station and existing overhead lines, therefore, providing an opportunity to keep energy infrastructure close together. Sandlings SPA, Leiston – Aldeburgh SSSI and North Warren RSPB Reserve boarder this Area to the south.

Converter site Area C

2.1.2.26 Area C is located on the site of the former Leiston Airfield and is bordered to the south by Harrow Lane to the northwest by Theberton Woods. Moat Road runs west to east through the northern half of the Area.

Converter site Area D

2.1.2.27 Area D is located to the west of Leiston and is bordered to the northwest by the B1119 and Abbey Road and to the west by the Hundred River. There is a small parcel of Ancient Woodland (Buckles Wood) located within the north of this Area adjacent to Buckleswood Road. There is an area of Flood Zone 2 and 3 on the far western boundary of the Area associated with the Hundred River.

Converter site Area E

2.1.2.28 Area E is located to the south of Knodishall and is bounded to the east by the Suffolk Coasts and Heaths AONB, the south by the A1094 Aldeburgh Road and the B1069 (Snape Road) runs southwest to northeast through the centre of the Area. There is a small area of Ancient Woodland at Great Wood located on the eastern edge of the Area and Grove Wood Ancient Woodland is located adjacent to the northwest corner of the Area.

Converter site Area F

2.1.2.29 Area F is located to the southeast of Sternfield and west of Friston. An unnamed road linking Church Hill in the north to the A1094 in the south borders the west of the option area and the B1121 boarders the Area to the north and northeast. Red Lane and Kiln Lane run west to east through the northern half of this Area. The existing 400 kV overhead lines run southwest to northeast through the centre of this Area. The Suffolk Coast and Heaths AONB is located to the south of the Area, south of the A1094.

Converter site Area G

2.1.2.30 Area G is located the southwest of Saxmundham and is bordered to the east by the A12 and the west by Deadmans Lane.

Converter site Area H

2.1.2.31 Area H is located to the west of Gromford and is bounded to the south and east by a railway line the west by Langham Road, Racewalk Covert is located to the north of the site. Snape RSPB Reserve is located to the south of the Area, south of the railway line.

Converter site Area I

2.1.2.32 Area I is located to the east of Lower Hacheston and is bounded to the north by the A12. The existing 400 kV overhead lines and railway line cross the far southeastern boundary of the Area. A small area of Flood Zone 2 and 3 is located in the northeastern corner of option the Area, associated with the River Ore.

Summary of appraisal outcomes

2.1.2.33 Of the possible connection points in the Sizewell area, only the Sizewell B substation is currently in existence; all the other proposed connection points would require the installation of a new substation, either proposed through another project in the area, , or installed as part of this Proposed Project. Connecting into the existing Sizewell B or consentedSizewell C substation would require taking over two of the super grid transformer (SGT) circuits feeding the existing Leiston 132 kV substation by connecting into the 400 kV circuits feeding the SGTs. This would require the installation of two new 400/132 kV SGTs in the converter station site with new 400 kV cables connecting into the existing Sizewell B or consented Sizewell C substation and new 132 kV cables connecting the SGTs in the converter station with the Leiston 132 kV substation. The 400 kV cable route to the substation would require either using the corridor allocated to the existing 132 kV connection or routeing through Sizewell Marshes SSSI. A connection into either the existing or proposed Sizewell substation would also need to consider the works to construct the proposed Sizewell C Nuclear Power Station as the program of works would overlap. This could have programme implications for the delivery of this Proposed Project in line with the needs case and to meet the required connection date.

2.1.2.34 At the time of the routeing and siting appraisal the Development Consent Order (DCO) that would deliver Friston substation (which forms part of the Proposed SPR East Anglia One North and East Anglia Two Offshore Wind Farm Projects) was advanced in the consenting process and it has subsequently received development consent.

2.1.2.35 A connection into the existing 400 kV overhead lines would require a new substation to be built. This was assessed on the basis that it would be combined within the converter station site Areas and would also require either the existing overhead lines to be diverted into and out of the new substation or a cable route (where economic and efficient) from a new substation to the existing overhead lines with a cable sealing end compound located adjacent to the overhead lines.

2.1.2.36 Converter site Areas A and B are both within the Suffolk Coasts and Heaths AONB but offered opportunities to keep existing and proposed energy infrastructure together. Both areas are also within land which is being used as part of ecological mitigation areas for the proposed Sizewell C Nuclear Power Station. As set out above a connection from either of these sites into either the existing or proposed Sizewell substation was significantly constrained and a connection into either the proposed Friston substation or a new connection into the existing 400 kV overhead lines would likely be required. Site Area A was not identified as a site suitable for either a connection into the proposed Friston substation or the existing 400 kV overhead lines due to the distance from this Area to these connection points.

2.1.2.37 Converter site Area C was constrained by the existing access, however the development of the proposed Theberton bypass as part of the proposed Sizewell C development, would alleviate some of these constraints if developed in time.

2.1.2.38 Converter site Area D was considered constrained by planned future development plans to the north including the proposed Sizewell C rail head and poor site access along the existing road network that would require routeing of traffic through the settlement of Leiston.

2.1.2.39 Converter site Areas E and F both had good access from the A1094 but were considered constrained by the proximity to the Suffolk Coasts and Heaths AONB in terms of the potential for setting impacts.

2.1.2.40 Converter site option areas G and H were considered highly constrained by future development plans on the eastern side of the A12 constraining the ability to connect into either the proposed Friston substation and, in the case of Area H, a new connection point on the existing 400 kV overhead lines.

2.1.2.41 Converter site option area I was not identified for a Sizewell or a Friston connection due to the distance from this proposed connection point so the site would require a new connection point to be established. This option area was also constrained by the length of onshore cable that would be required to connect to any of the landfall areas of search, increasing the spread of potential temporary disturbance during construction.

2.1.2.42 Due to the existing and proposed energy development within the study area coupled with the proximity of the Suffolk Coast and Heaths AONB in this locality the environmental and socio-economic appraisal concluded that an underground High Voltage Alternating Current (HVAC) connection would be preferred to an overhead line HVAC connection between the converter site options areas and any of the connection points.

2.1.2.43 These factors were considered when selecting the preferred option to take forward.

Route Corridors

Route corridors

2.1.2.44 Corridors were developed that could connect each of the landfall areas of search to each of the converter station site Areas.

2.1.2.45 Within Suffolk this process resulted in 15 corridors being identified:

- five corridors from each of the five landfall areas of search to the four converter site Areas that could connect into the existing and proposed Sizewell substations (**Figure 1.3.7 Suffolk Terrestrial Route Corridors Sizewell Connection**);
- five corridors from each of the five landfall areas of search to the seven converter site Areas that could connect into the proposed Friston substation (F**igure 1.3.8 Suffolk Terrestrial Route Corridors Proposed Friston Connection**); and
- five corridors from each of the five landfall areas of search to the five converter station site Areas that could connect into the existing 400 kV overhead lines (**Figure 1.3.9 Suffolk Terrestrial Route Corridors New Connection**).

Summary of appraisal outcomes

2.1.2.46 Within Suffolk none of the corridors avoided designated sites. The Suffolk Coasts and Heaths AONB extends across the full extent of the routeing and siting study area and was therefore unavoidable for any of the 15 corridors that were identified and appraised. Whilst the routeing and siting study area was drawn to provide opportunities to avoid designated sites and constraints, the Suffolk Coast and Heaths AONB extends unbroken from Felixstowe and Harwich in the south to Kessingland in the north. It was not therefore possible to avoid this designation and meet the need case without a significantly longer and indirect route that would not be in accordance with National Grid's statutory duties.

2.1.2.47 All three green corridors that connected with the southernmost of the five landfall areas of search S1, south of Aldeburgh, would require an extensive crossing of the Alde-Ore Estuary, which is designated as the Alde-Ore Estuary Ramsar, SPA and SSSI and the Alde-Ore & Butley Estuaries SAC. These corridors would also interact with the same designated sites around the settlements of Iken and Snape. A large proportion of the green corridors are also within Flood Zone 2 and 3 and would require the longest cable route within the Suffolk Coasts and Heaths AONB of all the corridors.

2.1.2.48 The three red corridors that connect to the landfall area of search S2, between Aldeburgh and Thorpeness would need to cross a section of the Leiston Aldeburgh SSSI as well as part of the North Warren RSPB Reserve. It was considered likely that trenchless construction techniques (subject to confirmation through further studies and ground investigations) could be used to avoid significant effects.

2.1.2.49 The three blue corridors that connect into the southern part of the landfall area of search S3 between Thorpeness and Sizewell would need to cross a section of Sandlings SPA and the Leiston Aldeburgh SSSI and would likely require interaction with the proposed cable routes for the East Anglia One North and East Anglia Two Offshore Wind Farms Projects.

2.1.2.50 The three purple corridors connecting into the northern part of this landfall area of search S3N, when considered in isolation, provided an opportunity to avoid sites designated for nature conservation but would entail interaction with the proposed Sizewell C Nuclear Power Station project.

2.1.2.51 The three orange corridors connecting to the most northern landfall area of search S5, to the north of Sizewell would need to cross Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve and would entail significant interaction with the proposed Sizewell C Nuclear Power Station project.

2.1.2.52 Four pinch points were identified within the route corridors:

- The first was at a crossing of Leiston Road close to Aldeburgh Golf Course, which would be crossed by all three red corridors connecting to the landfall area of search S2.
- The second of these was located between the B1353 and Leiston Road and would require cable routes to cross the Sandlings SPA, the Leiston – Aldeburgh SSSI, and a section of the golf course, as well as having a pinch point at the crossing of Leiston Road. This pinch point would affect the three blue corridors connecting to landfall area of search S3.
- The third pinch point was to the south of Aldringham at the crossing of the Hundred River. This area is constrained by the Hundred River itself, the crossing of the B1353 and the B1122, and an area of woodland and properties. In addition, the cables for the East Anglia One North and Two Offshore Wind Farms are proposed to be routed through this same pinch point. This area would need to be routed through (depending on which converter station site Area is selected) by the three purple corridors connecting to landfall area of search S3N or by all three blue corridors connecting to landfall area of search S3 to avoid the second pinch point.
- The fourth pinch point was to the northwest of Leiston and is associated with the offsite works for the proposed Sizewell C Nuclear Power Station including an area that has recently been established for ecological mitigation measures related to the project. This area would need to be routed through (depending on which converter station Area is selected) by the three purple corridors connecting to landfall area of search S3N.

Identification of the Initial Preferred Option

2.1.2.53 The evolution of the Suffolk Onshore Scheme at the routeing and siting stage is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheets 1 to 4**.

2.1.2.54 The connection points, landfall areas of search, converter site option areas, route corridors and nearshore marine alignments considered at the routeing and siting stage are shown on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 1 of 4**.

2.1.2.55 Significant engineering and environmental constraints associated with a connection into either the existing or proposed Sizewell substations meant that these options were not preferred. Connecting to a new connection point in the area, with an associated additional substation, was also not preferred as there would be no environmental or socio-economic, technical, or economic benefit over connecting into an existing (where possible) or proposed substation. The proposed Friston substation (which is now consented) was therefore identified as the preferred connection point. As a consequence, those converter site Areas (Area A and Area I) which were not identified for a Friston connection were discounted alongside the associated terrestrial corridors. This is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 2 of 4**.

2.1.2.56 Landfall area of search S4 was identified as being significantly constrained from a terrestrial perspective as no onward terrestrial route corridor was identified from this landfall area of search due to the existing and proposed Sizewell Nuclear Power Stations. The marine approach was also constrained by the number of cable crossings, therefore this option was not taken forward. This is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 2 of 4**.

2.1.2.57 Whilst the marine alignment to landfall area S1 was relatively unconstrained, the terrestrial green corridor was constrained technically by two large river crossings of the Alde and Ore River which would also require a crossing of the Alde-Ore and Butley SAC in two places and the Alde-Ore Estuary SPA and SSSI in three places. A large proportion of this corridor was also within the Flood Zone and this corridor would require the longest route within the Suffolk Coast and Heaths AONB. Access to this corridor was very limited, in particular in the area between the two large river crossings due to the nature and scale of the existing road network. As such, area S1 was discounted. This is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 3 of 4**.

2.1.2.58 The marine approach to landfall area S3 was significantly constrained by the presence of rocky reefs. Onward terrestrial routeing within the blue corridor would also likely require a crossing of Sandlings SPA and Leighton-Aldeburgh SSSI although the potential for significant effects were considered likely to be reduced through the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations). This is illustrated in **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 3 of 4**.

2.1.2.59 The marine approach to landfall S5 was constrained by the number of crossings offshore. Terrestrially the onshore orange corridor is constrained at the landfall by the presence of both European and national designated sites for nature consideration, albeit it was considered likely that significant effects could be reduced through the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations). The orange corridor also crossed a large area of the proposed Sizewell C Nuclear Power Station development area which could significantly constrain the ability to route through this area and also have programme implications associated with construction sequencing of the two developments. This is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 3 of 4**.

2.1.2.60 The marine approach to the landfall area S2 had fewer constraints, however the Leiston – Aldeburgh SSSI and North Warren RSPB reserve could not be avoided. The use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) would reduce the impacts at this landfall. The red terrestrial route corridor from this landfall area of search also included the pinch point along Leiston Road. This is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 4 of 4**.

2.1.2.61 The northern part of the landfall area of search S3 (S3N) could avoid the area of rocky reef which significantly constrained the marine approach to S3; however, the presence of existing and proposed cables at this landfall area and in the nearshore environment constrained potential marine alignments. The purple terrestrial route corridor connecting to this landfall area of search could avoid the designated sites for ecological conservation but could not avoid either of the two following pinch points. The first of these pinch points is to the south of Aldringham at the crossing of the Hundred River. This area is constrained by the Hundred River itself, the crossing of the B1353 and the B1122, and an area of woodland and properties. In addition, the cables for the East Anglia One North and Two Offshore Windfarms are proposed to be routed through this same pinch-point. The second pinch point is to the northwest of Leiston associated with the offsite works for the proposed Sizewell C Nuclear Power Station including an area that has recently been established for ecological mitigation measures related to the project. This is illustrated on **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 4 of 4**.

2.1.2.62 Converter site Area B was constrained as this site is within the Suffolk Coasts and Heaths AONB and overlaps with an area that has been established for the proposed Sizewell C Nuclear Power Station ecological mitigation, which has been maturing for a number of years and would be very difficult, if not impossible, to replace. Area C would also result in a significantly longer onshore cable route if landfall area of search S2 and the red corridor were selected. Area C was also constrained by the existing access. Area D is considered constrained by planned future development plans to the north included the proposed Sizewell C rail head and poor site access along the existing road network that would require routing of traffic through Leiston. Area G was significantly constrained by future development plans on the eastern side of the A12 and Area H was constrained by a new connection point on the existing 400kV OHL. Areas E and F were both in close proximity to the Suffolk Coasts and Heaths AONB and therefore setting impacts were a consideration for both. The landscape character of Area F is more open than Area E, and Area E provided a greater opportunity to mitigate both through the use of existing and additional screening. Both Areas had good access to the strategic highway network. Area E would result in a shorter onshore cable route from either landfall area of search S2 and the red corridor, or else landfall area of search S3N and the purple corridor. This is illustrated **Figure 2.1.1 Evolution of the Suffolk Onshore Scheme – Routeing and Siting Stage, Sheet 4 of 4**.

2.1.2.63 On balance the preferred solution identified was landfall area of search S2 connecting to a converter station site Area E via the red corridor with a connection back to the network through the proposed Friston substation. This is illustrated on **Figure 2.1.2 Suffolk Onshore Scheme Initial Preference – Routeing and Siting Stage**.

2.1.2.64 Whilst Area E was constrained at the landfall due to presence of terrestrial nature conservation sites it was identified that trenchless installation methods could be used to reduce potential impacts. However, as further survey work was required to confirm the feasibility of using trenchless techniques at this landfall it was considered prudent to also progress an alternative. This alternative was landfall area of search S3N and a connection to converter site Area E via the purple corridor with a connection back to the network through the proposed Friston substation. This is illustrated on **Figure 2.1.2 Suffolk Onshore Scheme Initial Preference – Routeing and Siting Stage**.

2.1.2.65 Area E was the preferred converter station area prior to the investigation of coordination.

Stakeholder Feedback and Option Refinement

2.1.2.66 Through engagement, Suffolk County Council and East Suffolk District Council encouraged National Grid to explore opportunities to coordinate with the interconnector projects being proposed by National Grid Ventures (NGV) in the area, namely Nautilus Interconnector and LionLink (formally known as EuroLink) Interconnector, which would require similar onshore infrastructure.

2.1.2.67 Coordination may mean a variety of different things, from sharing of data and site survey information, sharing construction materials such as stone for temporary access tracks (if projects are constructed in sequence) through to physical co-location or even sharing of infrastructure. Whilst it is possible to share certain types of infrastructure, for example car parks, accesses, and landscaping, the sharing of large-scale infrastructure would not necessarily realise benefits as there would be no reduction in the size of development or its footprint. National Grid has explored the concept of co-locating converter stations, sharing cable corridors and consolidating landfalls as part of the exploration of coordination. These elements of coordination are considered to reduce the potential spread of infrastructure through a rural environment, concentrating development in a single area. It could also allow for sharing some elements of infrastructure, such as temporary and permanent access, and allows for shared mitigation. This is explained in the following sections. .

2.1.2.68 National Grid has backchecked and reviewed all potential converter station sites/Areas that were identified independently through both NGV's non-statutory consultation for the Nautilus Project[1] and the routeing and siting option appraisal for the Proposed Project described above. This backcheck and review considered whether it was feasible for any of the converter Areas to accommodate up to three co-located converter stations and whether there were any additional sites that should be investigated/appraised further for co-location opportunities.

2.1.2.69 The landfall areas of search S2, between Aldeburgh and Thorpeness and S3 and S3N, between Thorpeness and Sizewell were revisited, along with the red, blue and purple cable corridors, to understand the feasibility of co-located landfalls and corridors.

[1] At the time of routeing and siting, potential converter station sites for LionLink were not know only those for the proposed Nautilus Project. The outputs of the exploration of coordination and co-location with NGV fed into the routeing and siting that was subsequently undertaken for LionLink which they consulted on in October 2022.

2.1.2.70 Seven sites were identified as potentially offering opportunities for co-location, some of which aligned with the original converter station Areas identified for Sea Link, and some that had not been previously considered. These are illustrated on **Figure 2.1.3 Potential Coordinated Converter Station Sites – Routeing and Siting Stage.** An appraisal was undertaken of these sites in accordance with the National Grid options appraisal methodology described in **Volume 1, Part 1, Chapter 3, Main Alternatives Considered**.

Potential coordinated converter station sites considered

2.1.2.71 A summary of key considerations for each of the seven sites illustrated on **Figure 2.1.3 Potential Coordinated Converter Station Sites – Routeing and Siting Stage** is described in the following sections.

Site 1

2.1.2.72 Site 1 was contiguous with part of converter site Area E and offered good existing screening to the north of the site and good construction access to the strategic road network. It is close to the Suffolk Coast and Heaths AONB so setting was a consideration for this site. However, the site offered good opportunities for mitigation in keeping with the existing landscape character. This site also offered the shortest overall onshore cable route.

Site 2

2.1.2.73 Site 2 was contiguous with part of converter site Area F and whilst being located close to the strategic road network in terms of access, in terms of landscape character it is a very open landscape and development of a coordinated solution on this site would likely require substantial mitigation. Suffolk Coast and Heaths AONB is adjacent to the southern boundary of this site. The settlement of Sternfield is located to the northwest of the site, Church Common to the southwest of the site and Friston to the east of the site.

Site 3

2.1.2.74 Site 3 was located further from the Suffolk Coast and Heaths AONB but in close proximity to the settlement of Saxmundham. There was good existing screening along the western and southern edges of the site, this along with the topography of the local area would limit the intervisibility between the settlement and the site. Access to this site is constrained and would need to be routed through the settlement of Saxmundham if taken off the B1119. An alternative opportunity does exist to take permanent construction access from the B1121. This would require construction of a permanent access route and a potential crossing of the River Fromus or the railway line.

Site 4

2.1.2.75 Site 4 was contiguous with part of converter site Area C and was located further away from the AONB and offers good existing screening and additional screen planting could be developed in keeping with the existing landscape character. Access to this site was challenging as it is accessed via small country roads; however, Site 4 did have the benefit of the proposed new link road being developed as part of the proposed Sizewell C Nuclear Power Station albeit the cumulative impact with this development would be a consideration. The site contains the former RAF Leiston Airfield, therefore this non-designated asset would need to be considered further if taken forward for development.

Site 5

2.1.2.76 Site 5 was located approximately 2.5 km from the Suffolk Coast and Heaths AONB at its closest point. There are smaller settlements that surround the site on the west, south and east, although intervening vegetation, particularly in the southern part of the site, would provide a degree of existing screening. The existing overhead lines are routed to the south of the site, and this was the closest of the proposed sites to the proposed Friston substation development. There are a number of non-designated assets within the site which include potential extensive remains of a roman settlement and villa within the north of the site. Physical impacts to these assets could potentially be avoided if development were to take place in the southern part of the site. A small section of Flood Zones 2 and 3 are located along the eastern boundary of the site associated with the Hundred River although it was considered likely that these areas could be avoided. This site is located further from the strategic road network and routeing construction traffic through settlements is was considered unlikely to be avoidable.

Site 6

2.1.2.77 Site 6 was contiguous with converter site Area D and located approximately 1.5 km from the AONB at its closet point. The site is located to the west of the settlement of Leiston and north of the settlement of Knodishall. There are a number of woodland blocks and shelterbelts which did offer some opportunity for existing screening and integration of mitigation planting. There are a number of historical designated assets within the settlements of Leiston and Knodishall but these are well screened by existing vegetation surrounding the assets. Similar to Site 5 this site is located further from the strategic road network and routeing construction traffic through settlements was considered unlikely to be avoidable.

Site 7

2.1.2.78 Site 7 was contiguous with part of converter site Area D and located within the Suffolk Coast and Heaths AONB adjacent to the existing nuclear power stations and the Galloper and Gabbard Offshore Windfarm substations as well as the proposed Sizewell C Nuclear Power Station. Whilst within the designated site, this site did offer the opportunity to keep energy development close together. The settlement of Leiston is located to the west of this site although it is the industrial edge of this settlement closest to the site. Existing planting along the southern boundary of the site also provided good existing screening. Sandlings SPA is adjacent to the southern boundary of this site and Sizewell Marshes SSSI to the northern and western boundaries. The site is currently being used as a reptile mitigation area for the proposed Sizewell C Nuclear Power Station, therefore should this site be developed, this would need to be

considered. This is the furthest of the sites from the strategic road network and like Site 4 access was constrained based on the existing road network. The proposed bypass as part of the proposed Sizewell C Nuclear Power Station would reduce potential impacts if in place for the start of construction but the cumulative impacts with the Sizewell C development would need to be considered. A connection back into Friston from Site 7 was also technically challenging (due to being constrained by a pinch point at Aldringham and at the crossing of the Hundred River) and an alternative solution would likely be required in terms of connecting into the existing network on the site.

Potential for coordinated (co-located) landfalls

2.1.2.79 As set out above landfall area of S2 interacts with the Leiston – Aldeburgh SSSI and North Warren RSBP reserve but had fewer constraints on the marine approach and was not constrained by the presence of any other existing or proposed infrastructure.

2.1.2.80 As set out above the majority of landfall S3 was considered significantly constrained in the immediate offshore environment due to the presence of the bedrock reef of the Coralline Cragg formation which is an important feature when considering coastal processes. Opportunities to reduce interaction with this feature were identified to the northern and southern ends of the landfall area of search however the southern extent of the landfall is spatially constrained by the proposed East Anglia One North and East Anglia Two Offshore Windfarm developments.

2.1.2.81 Whilst reducing interaction with the bedrock reef of the Coralline Cragg compared to S3, the routeing and siting process identified that landfall S3N had constraints associated with existing and proposed onshore and offshore infrastructure. When appraised as a landfall for the Proposed Project and as described in the sections above this landfall was identified as alternative to take forward. When considered as co-located landfall it was identified that whilst landfall maybe achieved with two sets of cables but with significant technical complexity it was considered unlikely/impossible that landfall could be made with three sets of cables due to the space available.

2.1.2.82 The appraisal identified that only landfall area of search S2 could potentially deliver a co-located landfall solution for three sets of cables.

Potential for coordinated (co-located) terrestrial route corridors

2.1.2.83 The assessment of the co-located terrestrial route corridors identified the same constraints as those identified for the red, blue and purple corridors appraised for the Proposed Project.

2.1.2.84 With regards to the four pinch points that were identified and are unavoidable on either the red, blue or purple corridors the third pinch point was identified as not being able to accommodate a co-located solution. This would affect routes within the blue or purple corridors from landfall S3N depending on the location of the converter station.

2.1.2.85 Landfall S2 and the associated red corridor was the only landfall area of search/terrestrial corridor combination that could provide co-located solution for three projects. It was however identified that the pinch point crossing within this corridor at Leiston Road may require the separation of the circuits over a short length including routeing some of the cables through the Aldeburgh Golf Course.

Suffolk Onshore Scheme preferred option

2.1.2.86 Following a backcheck of the initial preferred option for the Proposed Project and taking account of the appraisal findings of potential co-located options, Converter Site 1 and Site 3 were identified as emerging preferences for the Proposed Project and sites which could also accommodated co-location with other projects. Site 1 was in the originally preferred converter Area E, whereas Site 3 was a new site for the Proposed Project, having originally been identified by National Grid Ventures as part of the Nautilus site selection process.

2.1.2.87 Landfall S2 and the red corridor remained the emerging preference and this option was also identified as potentially providing for a co-located landfall and cable route with other projects.

2.1.2.88 Landfall S3N and the purple corridor remained an alternative option until further studies and survey work had been undertaken to determine the installation technique. However, this option could not facilitate a co-located landfall or terrestrial cable route to either Converter Site 1 or Site 3.

2.1.3 Suffolk Onshore Scheme Description at Non-statutory Consultation

2.1.3.1 The Suffolk Onshore Scheme consulted on during non-statutory consultation comprised of:

- HVAC connection, by underground cable, from the proposed Friston Substation to a converter station site;
- a new converter station site; and
- a HVDC underground cable from a new converter station site to a landfall on the Suffolk coast.

2.1.3.2 As described above there were options for the location of the infrastructure which makes up the Suffolk Onshore Scheme. These options were consulted on as part of non-statutory consultation.

2.1.3.3 There were five options in total which are listed below:

- Suffolk Site 1 Emerging Preference – this is illustrated on **Figure 2.1.4 Suffolk Site 1 Emerging Preference at Non-Statutory Consultation and EIA Scoping**;
- Suffolk Site 3 Emerging Preference – this is illustrated on **Figure 2.1.5 Suffolk Site 3 Emerging Preference at Non-Statutory Consultation and EIA Scoping**;
- Suffolk Site 1 Alternative – this is illustrated on **Figure 2.1.6 Suffolk Site 1 Alternative at Non-Statutory Consultation and EIA Scoping**;
- Suffolk Site 3 Alternative (Option 1) – this is illustrated on **Figure 2.1.7 Suffolk Site 3 Alternative (Option 1) at Non-Statutory Consultation and EIA Scoping**; and
- Suffolk Site 3 Alternative (Option 2) – this is illustrated on **Figure 2.1.8 Suffolk Site 3 Alternative (Option 2) at Non-Statutory Consultation and EIA Scoping**.

2.1.3.4 The graduated swathes shown on **Figures 2.1.4 to 2.1.8** illustrated the area within the preferred corridors, where, based on the understanding of baseline conditions at the time, the HVAC connection, converter station site and underground High Voltage Direct Current (HVDC) cables were likely to be routed/sited.

2.1.4 Suffolk Onshore Scheme Evolution from Non-statutory Consultation to the Proposed Project

Option Selection

2.1.4.1 As described above as part of the Suffolk Onshore Scheme, five options were consulted on as part of non-statutory consultation.

Emerging preferences vs alternative options

2.1.4.2 Five options were consulted on, two emerging preference options from landfall area of search S2 through to converter station sites 1 or 3 and three alternative options from landfall area of search S3N as illustrated on **Figure 2.1.4 to Figure 2.1.8**.

2.1.4.3 Landfall area of search S2 was identified as the emerging preference as it avoided both nearshore constraints and a number of terrestrial pinch points as explained in section 2, as well as being able to facilitate co-location with other projects. It was however acknowledged that landfall area of search S2 was constrained by the Leiston – Aldeburgh SSSI and the North Warren RSPB Reserve which are designated for their nature conservation value. Whilst feedback was received as part of non-statutory consultation with regards to the presence and the sensitivities of the designated sites at the landfall area of search S2, no different or additional information was received.

2.1.4.4 The emerging preference options (Site 1 emerging preference and Site 3 emerging preference) could provide opportunity for the co-location of up to three projects within the same corridor. Further technical studies have also been undertaken since non-statutory consultation which, subject to the results of ground investigations, confirmed that a trenchless crossing beneath the designated sites, in order to avoid direct effects is achievable. This, coupled with feedback relating to the opportunity to coordinate with other proposed projects, means that landfall area of search S2 remains the emerging preference.

2.1.4.5 Having regard to feedback received through non-statutory consultation and National Grids ongoing work no different or additional information has altered the preliminary conclusions in respect of the two emerging preference options being preferred to the three alternative options. .

Site 1 Emerging Preference vs Site 3 Emerging Preference – converter station sites

Landscape and visual

2.1.4.6 Whilst both sites are located outside of the Suffolk Coast and Heaths AONB, Site 1 is closer to this designation and therefore there is more potential for impacts on the setting of this designation.

2.1.4.7 Whilst Site 1 is in closer proximity to the Suffolk Coast and Heaths AONB the site is surrounded by a number of areas of mature planting including Great Wood, Foxburrow Covert and Ten Acre Covert all of which provide opportunity for existing screening and to integrate additional screen planting into the existing landscape character. It is noted that Great Wood is designated as Ancient Woodland and therefore a standoff with this designation would be required.

2.1.4.8 There is limited intervisibility between Site 1 and nearby settlements and the local road network because of intervening mature vegetation, however there are some properties and farmsteads interspersed in the local landscape that would be likely to experience close proximity views.

2.1.4.9 Site 1 is located close to the Sandlings Walk recreational route; however, there is limited intervisibility due to the existing intervening mature coverts. Views would also likely be experienced from road users travelling along the A1094 although mature roadside hedgerow planting would provide a degree of screening to views.

2.1.4.10 The local Public Right of Way (PRoW) network crosses Site 1 therefore there is likely to be a need to temporarily and/or permanently divert the PRoW network. The site would also result in close proximity views from visual receptors on such routes.

2.1.4.11 Site 3 is further from the Suffolk Coast and Heaths AONB and the potential for an impact on the setting of this designation is therefore considered unlikely.

2.1.4.12 The site is in close proximity to Bloomfields's Covert and other mature tree belts and copses providing opportunity to integrate additional screening into the wider green infrastructure network and potentially providing opportunity to reinstate historical pockets of woodland.

2.1.4.13 Site 3 has landscape value in terms of function and distinctiveness as it forms part of the open gateway into the settlement of Saxmundham, therefore development of this site would increase the likelihood of adverse landscape effects and impacts on the setting of the settlement.

2.1.4.14 There is potential intervisibility with residential receptors on the edge of Saxmundham and residential properties in immediate proximity and farmsteads interspersed in the local landscape.

2.1.4.15 The local PRoW network crosses Site 3 therefore there is likely to be a need to temporarily and/or permanently divert the PRoW network. The site would also result in close proximity views from visual receptors on such routes. There are likely to be open views from the B1119, which represents a key vehicular route on the approach to Saxmundham, noting opportunities for landscape mitigation.

Historic environment

2.1.4.16 The closest designated asset to Site 1 is Grade II Listed Billeaford Hall which is located adjacent to the northern boundary of the site. The closest designated asset to Site 3 is the Grade II Listed Wood Farmhouse which is located adjacent to the western boundary of the site. There are a number of other designated assets to the west and south of Site 3 although existing woodland blocks and topography provide limited intervisibility with the site. Whilst there are designated assets adjacent to both sites it is likely that screening could be incorporated more easily into the existing landscape character at Site 1 due to the existing woodland network and the existing screening around the asset itself.

Biological environment

2.1.4.17 Site 1 is located adjacent to Great Wood which is listed on the Ancient Woodland inventory and designated as a County Wildlife Site.

2.1.4.18 Whilst Site 1 is adjacent to Ancient Woodland it is likely an appropriate 15 m buffer (standoff) could be maintained between the development and the designation thereby avoiding loss or deterioration of the woodland. Opportunities may also exist to strengthen the green infrastructure network around the site.

2.1.4.19 Site 3 is not adjacent to any designated sites although an area of woodland (Bloomfield's Covert) and other mature tree belts and copses are located adjacent to the site. It is likely that appropriate buffers could be maintained between development on this site and the mature woodland blocks. Opportunities may also exist to strengthen the green infrastructure network around the site.

2.1.4.20 Protected species surveys have not yet been undertaken to confirm presence or absence but due to the habitats present within and surrounding each site it is likely there is a greater potential for protected species to be present within Site 1. This will continue to be back checked as more survey data is gathered.

Physical environment

2.1.4.21 Both sites are located within Flood Zone 1 and Source Protection Zone 3 and both sites are located on agricultural land which is anticipated to have a very low potential for significant contamination to be present. Both sites are relatively flat with Site 1 gently sloping from northeast to southwest and Site 3 gently sloping from west to east.

2.1.4.22 Site 1 is located on freely draining slightly acid but base rich sandy soils, there is a lower risk of soil compaction or plastic deformation of these soil types during stripping and handling. Site 3 is located on slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. These soils can be difficult to handle or traffic without the risk of compaction and negative impacts to their structure.

Socio-economics

2.1.4.23 Site 1 is located in close proximity to the Sandlings Walk recreational route, however there is limited intervisibility with users of this walk due to the existing intervening mature coverts.

2.1.4.24 The local PRoW network crosses both Sites 1 and 3 therefore there is likely to be a need to temporarily and/or permanently divert the PRoW network should either site be developed. The sites would also result in close proximity views from receptors on such routes.

2.1.4.25 There are some properties and farmsteads interspersed in the local landscape around both Site 1 and Site 3 some of which would be likely to experience close proximity views.

2.1.4.26 There are a number of visitor accommodation units close to the southwest and south of Site 1 which may experience views of the site and to the northeast of Site 3.

2.1.4.27 Site 3 is adjacent to the settlement of Saxmundham however it is unlikely the development would lead to the severance of community facilities.

2.1.4.28 Site 1 is located adjacent to the A1094 and B1069 both of which would facilitate good access into the site. However, it has been noted through consultation that Blackheath Corner, which is the T junction between B1069 Snape Road and A1094 Aldeburgh Road, is an accident blackspot that would need to be considered in any access strategy for this site.

2.1.4.29 Feedback from consultation also indicated that the rail bridge on the A1094 to the east of the junction with the A12 is potentially unsuitable to Abnormal Indivisible Loads therefore an alternative route for AIL deliveries to Site 1 may need to be identified.

2.1.4.30 Site 3 is located adjacent to the B1119 however taking construction access off this road would require construction traffic to be routed through the centre of the settlement of Saxmundham. To avoid this, it is likely that a new access would need to be created off the B1121 either to the south of Saxmundham crossing the River Fromus or off the B1121 to the north of Saxmundham crossing the railway.

2.1.4.31 All the land within Site 1 is currently provisionally graded as a mixture of Agriculture Land Classification (ALC) Grade 3 and 4, therefore it is unlikely there will be large areas of Best and Most Versatile (BMV) land present. The whole Site 1 is within Countryside Stewardship (middle tier) agreement. The land within Site 3 is provisionally mapped at ALC grades 3 and 2, therefore there is a greater potential for the presence of BMV land within this site. A section of Site 3 is currently under entry level plus Higher Level Stewardship (environmental stewardship agreement).

2.1.4.32 Site 1 is located entirely within a minerals consultation area, whereas Site 3 is partly located within a minerals consultation area.

Technical considerations

2.1.4.33 Site 1 has a slightly steeper gradient than Site 3 therefore there is the potential that more earthworks would be required in order to construct the converter station. Site 3 is less spatially constrained than Site 1 therefore potentially providing more ability to microsite both permanent and temporary infrastructure within the site to avoid other constraints.

2.1.4.34 As set out above there is good access to Site 1 off the A1094 and B1069 noting the constraints associated with Blackheath Corner and the rail bridge. Site 3 would require an off-network access to be able to facilitate construction traffic accessing the site without passing through the centre of the settlement of Saxmundham.

Cable corridors

2.1.4.35 The cable corridors for both options are contiguous from the landfall through to Site 1. Both options would require a trenchless crossing beneath the Leiston – Aldeburgh SSSI and North Warren RSPB Reserve in order to reduce direct impacts and whilst avoidable both options would require temporary construction in proximity to the Sandlings SPA.

2.1.4.36 Both options would either need to cross the pinch point at the B1122 Leiston Road and to the north of Aldeburgh Golf Course for which there is a planning application to extend north or cross Leiston Road further south and route through the golf course.

2.1.4.37 Whilst Site 1 emerging preference has an overall shorter cable route than Site 3 emerging preference (6.5 km compared to 11 km), the HVAC cable is longer for Site 1 than it is for Site 3, 3.5 km and 1.5 km respectively. Due to the greater number of cables required for underground HVAC, this section has a greater working width typically 60m compared with 40 m for a HVDC cable. Therefore, whilst the overall cable route is longer for Site 3 the additional temporary land take is not proportionate to the additional length. Overall, however there is more potential for temporary effects on more receptors for Site 3 than Site 1 and more potential for physical impacts on unknown or unrecorded archaeology due to the additional length.

Selection of the Proposed Project: Suffolk Onshore Scheme

2.1.4.38 As set out above landfall area of search S2 was consulted on as the emerging preference. Whilst feedback was received regarding the designated nature consideration sites within landfall area of search S2, having regard to non-statutory consultation feedback and National Grid's ongoing work, no different or additional information emerged that altered the preliminary conclusions of the two emerging preference options being preferred to the three alternative options. The emerging preference options (Site 1 emerging preference and Site 3 emerging preference) which utilise landfall area of search S2 could provide opportunity for co-location of up to three projects within the same corridor. In addition, further technical studies have been undertaken since non-statutory consultation which have confirmed that, subject to the results of ground investigations, a trenchless crossing beneath the designated sites in order to avoid direct effects is achievable. Therefore, landfall area of search S2 remains the emerging preference. This landfall could also accommodate co-location with the NGV projects.

2.1.4.39 With regards to Site 1 emerging preference and Site 3 emerging preference, the Site 1 converter station is closer to the Suffolk Coasts and Heaths AONB which could potentially result in an impact on the setting of this designation which is unlikely on Site 3. There is direct access to Site 1 from the existing road network whereas Site 3 would require an off network access to be created in order to avoid routeing construction traffic through the settlement of Saxmundham. Site 1 is more spatially constrained due to the location of existing woodland blocks within the site therefore Site 3 would provide more potential to microsite the converter station and if co-located with other projects. Site 1 would also likely require more earthworks due to the slightly steeper gradient on the site.

2.1.4.40 Overall Site 3 would require a longer cable route and temporary land take. There would be more potential for temporary effects on more receptors for Site 3 than Site 1 and more potential for physical impacts on unknown or unrecorded archaeology due to the additional length. Site 1 however would require a longer length of HVAC cable than Site 3 which has a wider construction swathe.

2.1.4.41 On balance, overall Site 3 emerging preference has been identified as the preferred option for the Suffolk Onshore Scheme.

Consideration of coordination and co-location with other projects

2.1.4.42 Many respondents to the non-statutory consultation expressed the view that all major energy projects currently proposed in East Suffolk should be coordinated, thus reducing the perceived spread of industrialisation and reducing impacts on the area.

2.1.4.43 Both emerging preference options were identified at non-statutory consultation as being able to facilitate co-location of up to three HVDC projects. The potential impacts of each of the options would be the same as described above although temporary land take for the cable routes and permanent land take at the converter station sites would be greater under a co-located scenario. However, the overall land take would be less than if all three projects developed independent cable routes and converter station sites.

2.1.4.44 Whilst Site 1 and Site 3 are similar in area, there are more areas of vegetation within Site 1 that spatially constrain the site, this may limit opportunities to microsite up to three converter stations and the implementation of a landscape mitigation strategy. Site 3 is more open in landscape character therefore the placement of up to three converter stations within this site is likely to be more prominent in the landscape, however the site is less spatially constrained and therefore would allow for a comprehensive mitigation strategy.

2.1.4.45 As set out above the cable corridors are contiguous from the landfall through to Site 1. The area to the east of Friston and Grove Wood is spatially constrained due to the presence of Grove Wood, residential properties and farmsteads and the location of the proposed Scottish Power Renewables (SPR) East Anglia One North and East Anglia Two projects. Whilst both options could accommodate co-location through this section, Site 3 emerging preference would require HVDC cables through this section whereas Site 1 emerging preference would require HVAC cables through this section. Therefore, there may be more limited opportunity to microsite cables for Site 1 emerging preference due to the wider swathe required for HVAC.

2.1.4.46 On balance, Site 3 emerging preference has been identified as the preferred option for co-location, as well as being the preferred option for the Proposed Project alone (for the reasons described in paragraph 2.1.4.40 above).

Evolution of the Design of the Suffolk Onshore Scheme

Proposed Friston substation

2.1.4.47 Friston Substation already benefits from development consent granted to Scottish Power Renewables (SPR), pursuant to ‘The East Anglia ONE North Offshore Wind Farm Order 2022’ and ‘The East Anglia TWO Offshore Wind Farm Order 2022’.

2.1.4.48 The proposed Friston Substation is included in the Proposed Project to achieve a comprehensive consenting position in time for the Proposed Project. The proposed Friston substation included within the Proposed Project would comprise a 400 kV substation, containing primarily gas insulated switchgear (GIS) within a GIS building, but also include air insulated elements.

2.1.4.49 The Friston substation is likely to comprise one or more buildings which could house services, storage workshop, and relay room along with a backup diesel generator. The substation compound would include hard and soft landscaping, the substation will be enclosed by a fence and would contain a parking area and access road.

2.1.4.50 Delivery of the Friston Substation would also require the removal of one existing 4ZW 400 kV overhead line pylons, and installation of two new pylons on the 4ZW 400 kV overhead line. It could also include the re-conductoring of a short length of the 4ZW 400 kV overhead line.

2.1.4.51 The location of the proposed Friston substation is illustrated on **Figure 2.1.9 Evolution of the Suffolk Onshore Scheme HVAC Connection** and the proposed infrastructure required for the Proposed Project is shown indicatively in red on **Design Drawing S42_S/TDD/SS/0003**.

2.1.4.52 National Grid is proposing to construct Friston substation as part of the Proposed Project. The infrastructure required for the Proposed Project is shown indicatively in red on **Design Drawing S42_S/TDD/SS/0003**. A short section of re-conducting on the existing 4ZW overhead line may be required, in the event that the proposed Friston substation is constructed by National Grid as part of the Proposed Project. This is illustrated on **Figure 2.1.9 Evolution of the Suffolk Onshore Scheme HVAC Connection**.

2.1.4.53 Should the proposed Friston substation be installed under the current consent secured by SPR, the works required for the Proposed Project would be limited to the installation of new GIS bays and additional switch gear and bus bars, all within the boundary of the substation. This is illustrated indicatively in red on **Design Drawing S42_S/TDD/SS/0001**.

Proposed Proposed HVAC connection

2.1.4.54 The proposed HVAC connection would be located between the proposed Friston substation and the proposed Saxmundham Converter Station. It would be routed northwest from the proposed Friston substation for approximately 1.6 km to the south of the B1119 and north of the B1121. The length of the connection could increase depending upon the micro siting of the Saxmundham Converter Station.

2.1.4.55 The feedback received did not suggest any specific reroutes but did reinforce a more general need to reduce the impact of the route on the local landscape, habitats, roads and tourism and recreation.

2.1.4.56 The graduated swathe for the underground HVAC cables at non-statutory consultation was shown through the centre of the Site 3 Emerging Preference corridor. The draft Order Limits broadly follow the graduated swathe as shown on **Figure 2.1.9 Evolution of the Suffolk Onshore Scheme HVAC Connection.**

2.1.4.57 The draft Order Limits narrow to the northwest of the proposed Friston substation to take the most direct route to the proposed Saxmundham Converter Station site but remain wide to the west of Fristonmoor Lane to allow for further micro siting of the Saxmundham Converter Station within the site, and, as a consequence flexibility in the route of the HVAC cables to the converter station.

Proposed Saxmundham Converter Station

2.1.4.58 The indicative location of the Saxmundham Converter Station within the proposed site is illustrated on **Figure 1.4.2 Saxmundham Converter Station Indicative Location**. A typical arrangement for the Saxmundham Converter Station is illustrated on **Design Drawing S42_S/TDD/SS/0015**.

2.1.4.59 The feedback received did not suggest any specific design related matters other than to look for opportunities to reduce the height of the converter station, which will be considered. Feedback did reinforce a more general need to reduce the impact of the route on the local landscape, habitats, roads and tourism and recreation.

2.1.4.60 The graduated swathe for the converter station at non-statutory consultation was shown in the south of the site Area. Taking account of feedback received and further environmental and technical studies, the indicative location of Saxmundham Converter Station within the draft Order Limits is in the far south of the site Area adjacent to Bloomfield's Covert as shown on **Figure 2.1.10 Evolution of the Suffolk Onshore Scheme Saxmundham Converter Station**. The indicative location of Saxmundham Converter Station has been identified to utilise the existing screening of Bloomfield's Covert and the tree belt to the south of the site, reducing the potential for landscape and visual effects from the settlement of Saxmundham, B1119 and individual properties to the south, west and north of the site. Siting the proposed Saxmundham Converter Station in this location also utilises the existing screening to reduce the potential for setting effects on a number of Grade II Listed properties to the west and south of the site.

2.1.4.61 The draft Order Limits remain wide in this location around the whole site that was consulted on as part of non-statutory consultation to allow for the potential for co-location with the NGV proposed projects in the area, to allow for possible mitigation planting and to allow enough flexibility for co-location with NGV's converter stations.

2.1.4.62 The draft Order Limits extend beyond the previous Site 3 Emerging Preference corridor in the following locations:

- Approximately 200 m to the southwest through Bloomfield's Covert to allow for a potential temporary drainage outfall during construction.
- To the west by approximately 850 m, crossing the River Fromus to the B1121, and to the northwest by approximately 850 m crossing the B1119 and the railway line to the B1121 Main Road. These are to facilitate temporary construction access to Saxmundham Converter Station to avoid the need to route construction traffic through the centre of the settlement of Saxmundham.
- Lastly to the north of the B1119 to the west of Workhouse Lane by approximately 40 m, this is to facilitate landscape planting should the site be developed as a co-located site with the NGV proposed projects in the area.

2.1.4.63 The proposed Saxmundham Converter Station would include a DC hall, converter transformers, valve hall, reactor hall, AC switchyard, control building, strategic spare parts building, Low Voltage (LV) electricity supply, fire deluge pump house, car parking, a permanent access road and landscaping.

2.1.4.64 The proposed Saxmundham Converter Station would be up to 6.5 ha in area (excluding landscaping) and the valve halls could be up to 26 m in height excluding lightning protection, aerials, walkways, fall arrest equipment and potential architectural treatments (such as soft landscaping).

2.1.4.65 The design of this structure, in terms of the building form and the external materials, will be developed alongside consultation and stakeholder feedback. A Design Code for the building will be provided with the application for development consent. The Design Code will provide guidance regarding the design intent and design principles that will be adopted and embedded into the detail proposals of this structure. Proposed Underground HVDC Cables and Suffolk Landfall

2.1.4.66 Protecting Aldeburgh Golf club was a key theme in responses. The feedback received did not suggest any specific reroutes but did reinforce a more general need to reduce the impact of the route on the local landscape, habitats, roads and tourism and recreation.

2.1.4.67 The draft Order Limits broadly follow the previous graduated swathe from the landfall, across Leiston and Snape Road, through to the crossing of Sandlings Walk as illustrated on **Figure 2.1.11 Evolution of the Suffolk Onshore Scheme Underground HVDC Cables and Landfall.** From the crossing of Sandlings Walk (to the south of School Road) the draft Order Limits cross Grove Road to the north of Laurel Covert, this is within the corridor but to the south of the graduated swathe. This avoids the need for temporary construction activities on both sides of several properties with temporary construction activity from both the HVAC connection and the underground HVDC cables. The draft Order Limits re-join the graduated swathe at Fristonmoor Lane but remains wide from Fristonmoor Lane to the proposed Saxmundham Converter Station. This is to allow for further micro siting of the Saxmundham Converter Station within the site, and, as a consequence flexibility in the route of the underground HVDC cables to the converter station.

2.1.4.68 The proposed HVDC underground cables would be routed from the proposed Saxmundham Converter Station to the proposed Suffolk Landfall. They would be routed southeast from Saxmundham Converter Station passing to the north of the proposed Friston substation, south of Great Wood and north of the A1094. They would then be routed to the north of Old Broom Covert and Eight Acre Covert crossing the B1122 Leiston Road to the TJB located to the north of Warren Hill Lane and south of Sandlings SPA. The total length of the HVDC cable will depend upon the final micro siting of the Saxmundham Converter Station.

2.1.4.69 The Offshore Scheme has been refined on the approach to the Suffolk landfall. This refinement follows a combination of analysis of the marine survey data collected in summer 2021, and further advances in the Proposed Project design to identify a proposed location of the transition joint bay (TJB) to facilitate a trenchless crossing of the designated sites.

2.1.4.70 The landfall will be a committed trenchless crossing under Leiston – Aldeburgh SSSI and North Warren RSPB Reserve.

2.1.4.71 The draft Order Limits extend by approximately 350 m beyond the Site 3 Emerging Preference corridor along Sandlings Walk to the B1122 Leiston Road, this is to facilitate mobilisation and maintenance accesses by small vehicles or on foot.

2.1.5 The Suffolk Onshore Scheme

2.1.5.1 The draft Order Limits for the Suffolk Onshore Scheme are shown on **Figure 1.1.2 Suffolk Onshore Scheme Boundary** and **Volume 1, Part 1, Chapter 4 Description of the Proposed Project** provides a description of the proposed Suffolk Onshore Scheme.

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