



The Great Grid Upgrade

Eastern Green Link 3 (EGL 3) and
Eastern Green Link 4 (EGL 4)

Preliminary environmental information report (PEIR)

Non-Technical Summary
May 2025

EGL-WSP-CONS-XX-RP-YC-001

Contents

1.	Introduction	1
1.1	Overview	1
1.2	Purpose of this Non-Technical Summary	2
1.3	Eastern Green Link 3 and Eastern Green Link 4	2
	Draft Order Limits	3
1.4	Who is National Grid?	3
1.5	Why are EGL 3 and EGL 4 needed?	4
1.6	The consenting process for EGL 3 and EGL 4	5
2.	Reasonable Alternatives Considered	7
2.1	Introduction	7
2.2	Strategic proposal alternatives	7
2.3	Options Identification and Selection	9
	English Onshore Scheme	9
	English Offshore Scheme	10
2.4	Design Development since Non-Statutory Consultation	11
3.	Project Description	12
3.1	English Onshore Scheme: Permanent infrastructure	12
	Walpole Converter Stations	12
	Anderby Creek Landfall	13
	Underground cables	13
	New 400 kV Walpole Substation	14
	Environmental measures	15
3.2	English Offshore Scheme: Permanent infrastructure	15
3.3	Construction Programme	15
	English Onshore Scheme	16
	English Offshore Scheme	18
3.4	English Onshore Scheme: Construction methodology	18
	Construction working hours	18
	Access and enabling works	18
	Construction of the Walpole Converter Stations	19
	Anderby Creek Landfall	20
	Installation of underground cables	20
	Walpole B Substation	23
	River Nene Temporary Quay	23
3.5	English Offshore Scheme: Construction methodology	23
	Construction working hours	23

	Construction methodology	24
3.6	Operation and maintenance	24
3.7	Decommissioning	25
4.	EIA Approach and Methodology	26
4.1	Environmental Impact Assessment	26
	EIA Scoping	27
	Informal consultation and engagement	28
4.2	PEIR Approach and Methodology	28
	Environmental Measures	29
4.3	PEIR Structure	29
5.	Preliminary Environmental Assessment- English Onshore Scheme	30
5.1	Biodiversity	30
5.2	Cultural Heritage	32
	Effects during construction	32
	Effects during operation	33
5.3	Landscape and Visual Amenity	33
	Landscape effects	34
	Visual effects	35
5.4	Water Environment	36
	Effects during construction	37
	Effects during operation	37
5.5	Geology and Hydrogeology	38
	Effects during construction	39
	Effects during operation	39
5.6	Agriculture and Soils	40
	Effects during construction	41
	Effects during operation	41
5.7	Traffic and Transport	41
5.8	Noise and Vibration	43
5.9	Air Quality	45
5.10	Socio-economics, Recreations and Tourism	46
	Construction	48
5.11	Health and Wellbeing	49
6.	Preliminary Environmental Assessment- English Offshore Scheme	52
6.1	Designated Sites	52
6.2	Coastal and Marine Physical Processes	52
6.3	Intertidal and Subtidal Benthic Ecology	54
6.4	Fish and Shellfish	56
6.5	Intertidal and Offshore Ornithology	58
6.6	Marine Mammals	60
6.7	Shipping and Navigation	61

6.8	Commercial Fisheries	62
6.9	Other Marine Users	64
6.10	Marine Archaeology	65
7.	Project-Wide Effects	67
7.1	Greenhouse Gas	67
7.2	Cumulative Effects	68
8.	Next-Steps	70
8.1	What happens next?	70
8.2	What if I would like further information?	70

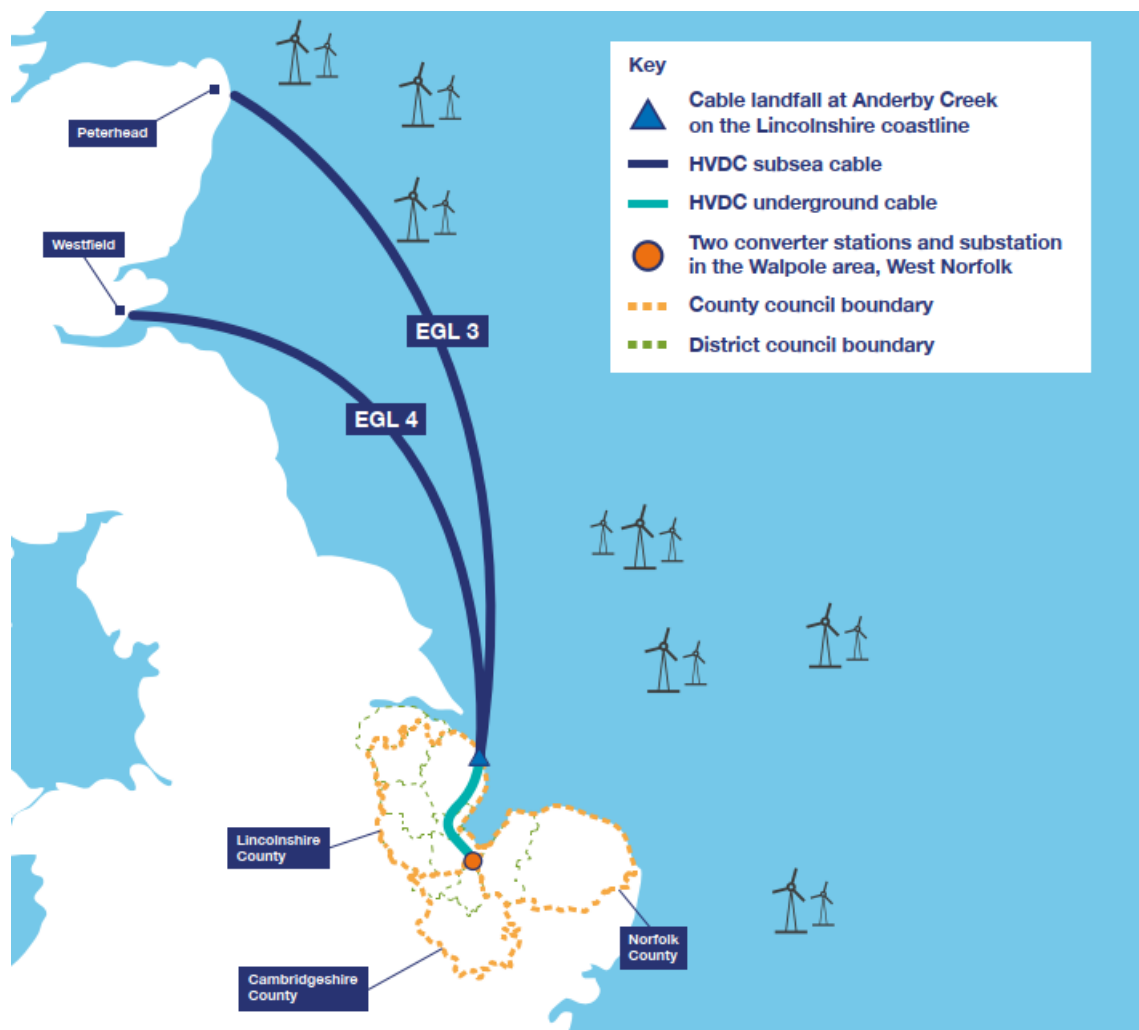
Table 1-1 – What’s included in the NTS	2
Table 3-1 – English Onshore Scheme Construction Programme	17
Table 8-1 – Public information events	70

1. Introduction

1.1 Overview

- 1.1.1 Eastern Green Link 3 (EGL 3) and Eastern Green Link 4 (EGL 4) (referred to as the 'Projects') are two proposed new electrical connections being developed by National Grid Electricity Transmission plc (referred to in this document as National Grid). This Non-Technical Summary (NTS) summarises the information from a preliminary environmental impact assessment (EIA) undertaken to date. More detailed technical information can be found in the Preliminary Environmental Information Report (PEIR). The PEIR, and subsequently, this NTS, are specific to the English components, both onshore and offshore, of EGL 3 and EGL 4. **Figure 1-1** illustrates the location of EGL 3 and EGL 4.

Figure 1-1: Overview of EGL 3 and EGL 4



1.2 Purpose of this Non-Technical Summary

- 1.2.1 The aim of this NTS is to enable the local communities and other stakeholders to understand the likely environmental effects arising from the Projects, based on the preliminary information and assessment undertaken to date (and as reported in the PEIR), in a concise manner which is easily understood and accessible by all. Effects are assessed in terms of how ‘significant’ they would be, and the EIA is primarily concerned with ‘likely significant effects’ and not those unlikely to be significant.
- 1.2.2 This NTS includes a description of the Projects, a summary of the consultation process and preliminary environmental information relating to the proposed works. **Table 1-1** sets out a summary of each of the sections of this NTS.

Table 1-1 – What’s included in the NTS

Chapter	What is it about?
1. Introduction	This Introduction chapter introduces National Grid, what the Projects are, where they are located and why they are needed.
2. Main Alternatives Considered	This chapter explains the main alternative designs considered to date and provides a summary of how the design has evolved and developed to date.
3. Project Description	This chapter explains how the Projects would be built (should they be consented), what new electricity infrastructure would be implemented and how long construction would take.
4. Approach and Methodology	This chapter explains how the preliminary assessment has been undertaken and how it has been informed by consultation and stakeholder engagement to date.
5. Preliminary Environmental Assessment - English Onshore Scheme	This chapter provides a summary of the potential environmental effects identified to date arising from the onshore elements of the Projects in Lincolnshire, Norfolk and Cambridgeshire which have been identified to date.
6. Preliminary Environmental Assessment - English Offshore Scheme	This chapter provides a summary of the potential environmental effects identified to date arising from the offshore elements of the Projects which have been identified to date.
7. Project-Wide Effects	This chapter provides a summary of the project wide assessments undertaken for the Projects including greenhouse gas and cumulative effects.
8. Next Steps	This chapter explains what happens next in the EIA process, and how you can have your say on the proposals.

1.3 Eastern Green Link 3 and Eastern Green Link 4

- 1.3.1 EGL 3 and EGL 4 are two proposed 2 gigawatt (GW) high voltage links being developed to reinforce the electricity transmission system between Scotland and England. The PEIR and this NTS, only consider the components of EGL 3 and EGL 4, which fall

within England and English Waters. Separate consents are required and will be sought for the Scottish elements of EGL 3 and EGL 4 and therefore have not been considered within the PEIR or this NTS.

- 1.3.2 The Projects span both marine (offshore) and terrestrial (onshore) environments and therefore they have been split into two geographical parts, referred to as the 'English Onshore Scheme' and the 'English Offshore Scheme', collectively termed 'the Projects'.
- 1.3.3 Broadly, the infrastructure required to deliver the Projects includes high voltage direct current (HVDC) and high voltage alternating current (HVAC) underground cables, two new converter stations, a new substation and associated works to an existing overhead line. Further details of the Projects can be found in **Chapter 3** of this NTS.
- 1.3.4 The English Onshore Scheme would be located within Lincolnshire, Norfolk and Cambridgeshire. The most northerly elements of the English Onshore Scheme would be located along the Lincolnshire coast in East Lindsey. From the coastline, the Projects would continue southwest of Boston and connect into the existing high voltage (400 kV) electricity transmission system at a proposed substation in the vicinity of the existing substation at Walpole (known as Walpole A substation) within King's Lynn and West Norfolk.
- 1.3.5 The English Offshore Scheme would be located within English waters. The most northerly elements of the English Offshore Scheme would be located at the English-Scottish boundary, and the most southerly elements would be located at the Anderby Creek Landfall, along the Lincolnshire coastline.
- 1.3.6 The Projects have been designed to increase the capability of the electricity transmission network to carry low carbon and renewable energy from where it is generated to where it is used in homes and businesses across the country.

Draft Order Limits

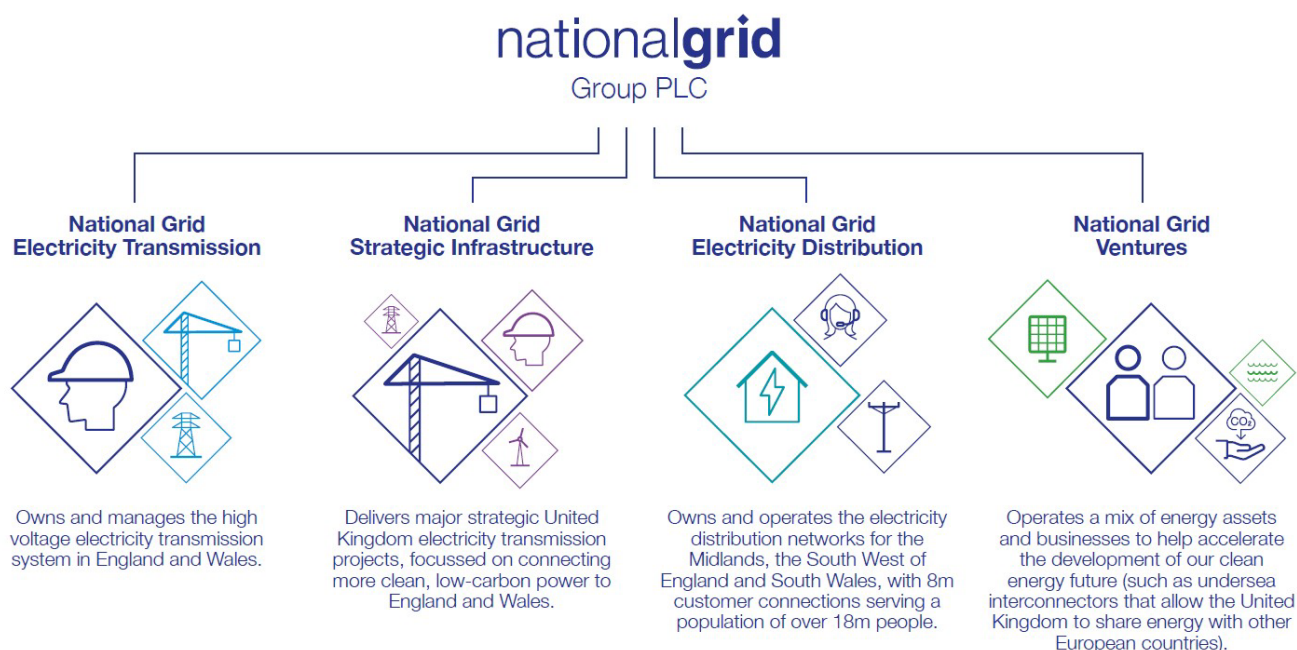
- 1.3.7 The draft Order Limits form the boundary of the entire area within which the Projects could take place, including temporary and permanent works as well as the works to the existing infrastructure. They represent the maximum extent of land within which the Projects may take place, as known at this stage of the Projects. The draft Order Limits for the Projects are shown in **Figure 1-2**. The English Onshore Scheme draft Order Limits are shown in **Figure 1-3**, and the English Offshore Scheme draft Order Limits are shown in **Figure 1-4**. **Figures 1-2 to 1-4** are presented in the separate NTS Figures document.

1.4 Who is National Grid?

- 1.4.1 National Grid delivers electricity safely, reliably and efficiently to the customers and communities it serves. The parts of National Grid involved in ensuring everyone has the essential electricity supplies needed are shown in the Diagram below.
- 1.4.2 National Grid Electricity Transmission, which is part of National Grid Group plc, is the organisation applying for development consent for the Projects and owns the high voltage electricity transmission system in England and Wales which transports electricity from generators (such as power stations and wind farms) to local distribution network operators (DNOs). DNOs, such as National Grid Electricity Distribution (in south Lincolnshire), are the companies that own and operate the local power lines and infrastructure that deliver electricity to individual properties. National Grid's transmission network does not connect directly to homes and businesses, because the voltage at

which it transmits electricity is too high for domestic and commercial properties. The structure of National Grid Group plc is shown in **Figure 1-5**.

Figure 1-5: National Grid Group plc structure



1.5 Why are EGL 3 and EGL 4 needed?

- 1.5.1 The UK Government is committed by law to reducing greenhouse gas emissions by at least 100% from the emissions produced in 1990 by 2050. This is known as 'Net Zero'. Electricity demand is also forecast to at least double by 2050, increasing the amount of electricity that needs to be transported to homes and businesses.
- 1.5.2 As a result, more energy is being generated from renewable sources, such as offshore windfarms, many of which are located off the coast of Scotland, and less energy is being generated using fossil fuels and coal in the north and Midlands of England.
- 1.5.3 Therefore EGL 3 and EGL 4 are needed to help strengthen the National electricity transmission network so that:
 - the growth in electricity generation, particularly in Scotland, can be transferred from where it's generated to where it is needed; and
 - the national electricity transmission network can accommodate the future overall growth in electricity generation and flows.
- 1.5.4 Further studies have identified that in the future, significantly higher flows of electricity will occur in the electricity networks in the north and east of England, including the electricity transmission network between the Scottish-English border and the Midlands. This will put pressure on the existing electricity transmission network and therefore reinforcement of the electricity network in the Humber, East Midlands, East of England and East Anglia areas is necessary to ensure optimal operation of the electricity transmission network and reliable, economic long-term supply of electricity.
- 1.5.5 EGL 3 and EGL 4 are two of 17 projects needed to ensure the electricity transmission network is fit for the future and is part of 'The Great Grid Upgrade': the largest overhaul

of the electricity grid in generations. For further details of The Great Grid Upgrade, please visit <https://www.nationalgrid.com/the-great-grid-upgrade>

- 1.5.6 Without additional reinforcement, the electricity transmission system would become overloaded and there would be a need to constrain power generation. This would involve paying generators to not produce power in one area to reduce congestion around a particular point in the transmission network. Such action could result in significant costs to consumers.
- 1.5.7 Further information about why EGL 3 and EGL 4 are needed, including details of the technical studies supporting this, can be found in **Volume 1: Part 1, Chapter 1 Introduction of the PEIR**.

1.6 The consenting process for EGL 3 and EGL 4

- 1.6.1 The Planning Act (2008) (the Planning Act) created a new development consent regime for major infrastructure projects, known as Nationally Significant Infrastructure Projects (NSIP), in the fields of energy, transport, water, wastewater, and waste. When these types of developments meet the threshold described in the Planning Act, they need a Development Consent Order (DCO) before they can be built. As this type of development is nationally important, consent for a project needs to be given by the government rather than the local planning authority. The Planning Act process was introduced to streamline the decision-making process for major infrastructure projects, making it fairer and faster for communities and applicants alike. NSIP applications are handled by the Planning Inspectorate on behalf of the relevant Secretary of State (SoS).
- 1.6.2 None of the components of the Projects fall within the definition of an NSIP under the Planning Act. However, National Grid sought two separate directions (one for EGL 3 and one for EGL 4) from the SoS for the converter station components of the Projects to be treated as an NSIP. This was granted by the SoS.
- 1.6.3 A DCO is a statutory order which allows the applicant to build their proposed development. It is similar to a planning permission but can also include other types of consent, such as marine licences, a form of consent granted for certain activities within the marine environment. As part of the DCO application for the Projects, Deemed Marine Licences will be sought for the Projects.
- 1.6.4 Under the Planning Act process, National Grid is legally required to consult with relevant organisations and the public on the Projects. The PEIR forms one of the documents that National Grid will be consulting on. The purpose of the PEIR is to provide early information to allow stakeholders and the local community to develop an informed view of the impacts of the Projects. This process involves identifying potentially significant adverse impacts resulting from the Projects, allowing them to be avoided or minimised where possible, as well as identifying any potential beneficial environmental impacts.
- 1.6.5 The DCO application for the Projects will be submitted by National Grid in 2026. The application will provide details of the Projects and will be accompanied by an Environmental Statement (ES). A single DCO application covering both the EGL 3 and EGL 4 Projects will be made.
- 1.6.6 Once National Grid has submitted the application for a DCO, the Planning Inspectorate will first decide whether to accept the application for Examination. If accepted for Examination, the Planning Inspectorate will appoint an independent Inspector or panel of Inspectors (known as the Examining Authority) to examine the application on behalf

of the SoS. The Examination is a public process in which interested parties are able to participate.

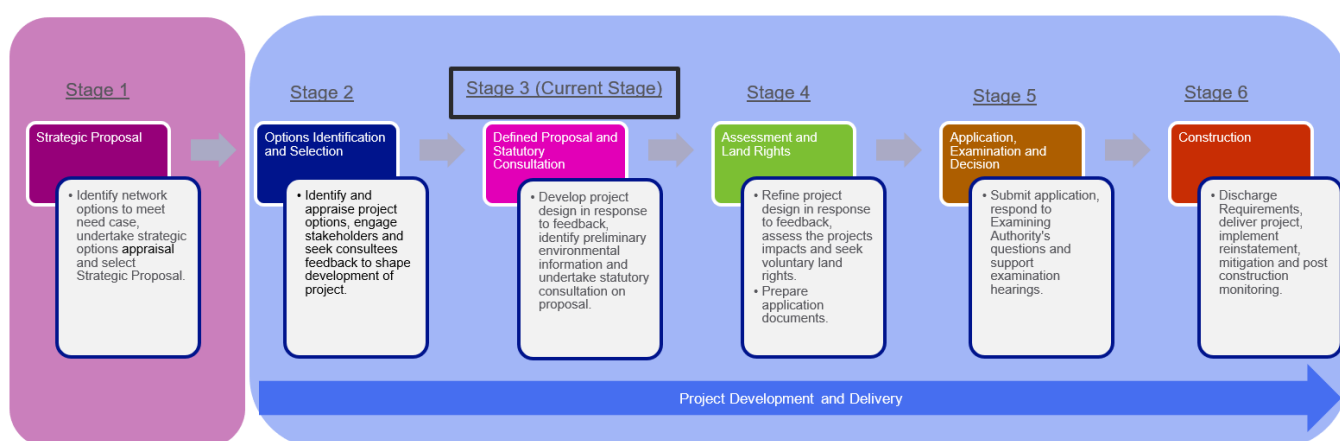
- 1.6.7 Following the examination, the Examination Authority will make a recommendation to the SoS as to whether consent should be granted. The SoS will decide whether development consent should be granted. The timescale between acceptance of the submission and a decision is approximately 18 months.

2. Reasonable Alternatives Considered

2.1 Introduction

- 2.1.1 The legal regulations on Environmental Impact Assessment (EIA) require that the 'reasonable' alternatives to a proposed development are considered. Such alternatives can relate to the location of a proposed development as well as its layout, size, scale and technology. The main reasons for selecting the preferred design, location and layout should be set out in the ES. Further information on the EIA process is set out in **Chapter 5** of this NTS.
- 2.1.2 National Grid's approach to considering alternatives is included as part of its publication 'Our Approach to Consenting' (<https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/planning-and-development>). This sets out the key stages National Grid takes to gaining consent for a proposed development and, as part of these stages, the approach to considering alternative options. The key stages are shown in **Figure 2-1**.

Figure 2-1: National Grid's approach to consenting



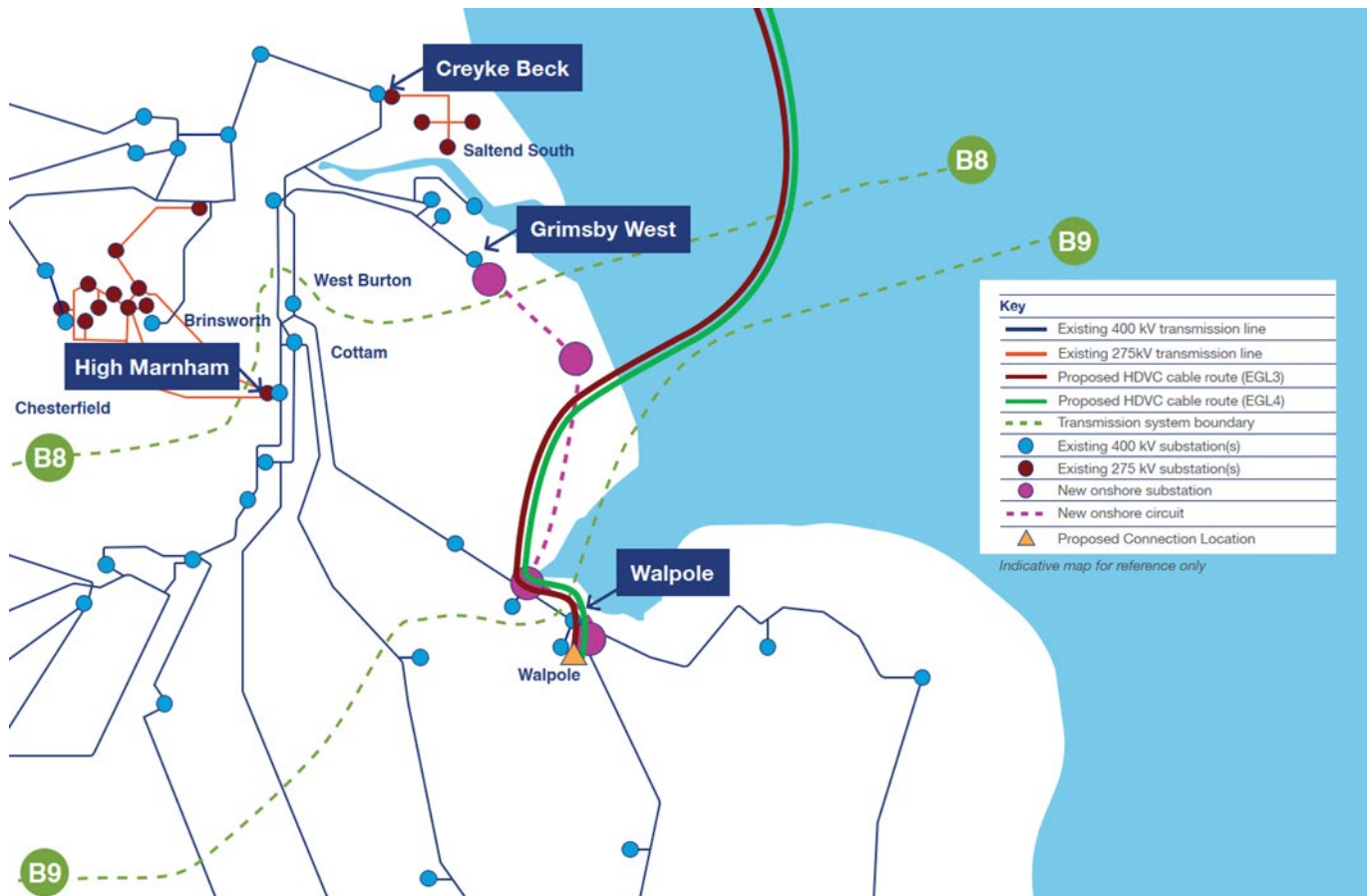
- 2.1.3 The options appraisal process compares options and assesses the positive and adverse effects of alternative options against a wide range of criteria, including how each option could impact the environment and people, technical complexity, the costs involved and how long it could take to implement or build each option, where relevant. The process also takes into account National Grid's legal duties. Each stage of the process follows a clearly defined methodology and the reasons as to why a particular option is preferred are clearly recorded.

2.2 Strategic proposal alternatives

- 2.2.1 As outlined in **Section 1.5**, studies showed that reinforcement of the electricity network was required in the Humber, East Midlands, East of England and East Anglia areas. The recommendation of the National Energy System Operator was a need for two new 2 GW HVDC links between Scotland and the South Humber area.

- 2.2.2 A range of strategic options that might address network needs were identified and appraised at a strategic level. These appraisals considered the likely environmental and socio-economic effects, technical issues, and costs that would be associated with each strategic option.
- 2.2.3 Initially, several strategic options were identified that connected several potential start and end points, including connection points at or near existing or planned substations. Appraisal of these options identified a shortlist of seven options for the connection point into the existing electricity network:
- EGL OPP1 West Burton substation;
 - EGL OPP2 Cottam substation;
 - EGL OPP3 Bicker Fen substation;
 - EGL OPP4 New Weston Marsh substation;
 - EGL OPP5 New Lincolnshire Connection Substation(s);
 - EGL OPP6 New Walpole substation; and
 - EGL OPP7 New Walpole substation with three ended HVDC link.
- 2.2.4 As well as the connection location, the appraisal of strategic options also looked at where the offshore cables would come onto the land (referred to as landfall). Each of the seven strategic options could make landfall on the Lincolnshire coastline. However, several internationally important wildlife sites, known as designated nature conservation areas, are present along the Lincolnshire coastline, and all seven options could have impacts on these conservation areas.
- 2.2.5 Therefore, taking into account the potential environmental impacts onshore, an option to for a landfall along the Norfolk coastline was also considered. The appraisal found that this was less preferred than having a landfall on the Lincolnshire coastline due to the presence of a range of protected landscapes, nature conservation sites and historically important sites on the Norfolk coastline. Some of these sites are highly sensitivity and therefore, potential impacts on them would be irreversible and permanent. Offshore, routing cables through the Wash or landing in north Norfolk were assessed to be unfeasible due a number of economic and technical constraints and environmental features.
- 2.2.6 EGL OPP6 was identified as the preferred strategic option for the Projects and is shown in **Figure 2-2**.

Figure 2-2: EGL OPP6 new Walpole Substation potential strategic option



2.2.7 Further information on the strategic optioneering process can be found on the National Grid project website: <https://www.nationalgrid.com/the-great-grid-upgrade/eastern-green-link-3-and-4> and **Volume 1, Part 1: Chapter 3 Reasonable Alternatives Considered**.

2.3 Options Identification and Selection

2.3.1 Once the strategic option was decided, the following stage of optioneering looked at alternatives for the different locations of the Projects infrastructure, such as different alternatives for the cable routes as well as the location of the landfall, converter stations and new substation.

English Onshore Scheme

2.3.2 The output of the process appraising different options onshore was reported in the Corridor and Preliminary Routing and Siting Study (the 'CPRSS').

2.3.3 This followed a stepped approach, undertaken in line with National Grid's Approach to Consenting, comprising:

- Step 1: Defining the study areas.
- Step 2: Scope of Environmental Topics and Data Gathering.
- Step 3: Ascribe a Weight to Confirm and 'Heat Map'.
- Steps 4 – 6: Identifying and Defining Siting Zones, Siting Areas and Corridors.

- Steps 7 - 8: Options Appraisal and Selection of Preferred Options.

- 2.3.4 A non-statutory public consultation was held between 23rd April 2024 to 15th July 2024. This consultation introduced the Projects, explained how National Grid had developed its proposals through the eight steps listed above, and sought the views of the public and stakeholders.
- 2.3.5 At non-statutory consultation National Grid consulted on the following preferred locations:
- Landfall at either Theddlethorpe or Anderby Creek.
 - A location for the Lincolnshire Converter Station to the northeast of Bilsby (DC5). At the time of writing the CPRSS, a third converter station was under consideration along with additional underground onshore cables to provide a three-ended connection (one connection into the electricity transmission network in Scotland and two connections south of the Humber).
 - A location for the Walpole Converter Stations east of the River Nene, southwest of the existing Walpole Substation and north of West Walton (WLP4/5).
 - A location for the new Walpole Substation north of Walton Highway and West Walton.
 - Two potential cable corridors from coastline; one from a new landfall at Theddlethorpe and one from a new landfall at Anderby Creek, either of which would then connect to the Lincolnshire Converter Station, if required. The cable corridor then skirted around the Lincolnshire Wolds and to the northwest of Gunby Park before continuing past Maltby le Marsh, Alford, Firsby, Frithville, Boston, and Sutterton and crossing the River Welland. The cable corridor then continued south to cross the A17 at Holbeach and would then either route southeast towards Tydd St Mary or follow the A17 before turning south at Sutton Bridge before reaching the preferred zone for the Walpole converter stations.
- 2.3.6 Within the corridors and Preferred Siting Zones, National Grid showed a graduated swathe. The darker areas of the swathe indicated, based on information available at the time, a more likely location for the infrastructure within the corridors. This was indicative and subject to further assessment work, and the consultation feedback National Grid received.
- 2.3.7 Further information on the corridors and Preferred Siting Zones can be found on the National Grid project website: <https://www.nationalgrid.com/the-great-grid-upgrade/eastern-green-link-3-and-4>. The emerging preferences as listed above are presented in Appendix B of the CPRSS and were consulted on at the non-statutory consultation.

English Offshore Scheme

- 2.3.8 For the English Offshore Scheme, a similar staged approach was used to appraise potential options before a decision on the Preferred Marine Route Alignments was made. This process resulted in two phases of Marine Route Alignments before the emerging preferences were selected for each of EGL 3 and EGL 4. Each scheme was appraised independently within a Marine Route Options Appraisal.
- 2.3.9 The appraisal of the potential options resulted in the following emerging preferences being taken forward to the next stage:

- The emerging preference for the landfalls was consistent with the English Offshore Scheme with both Theddlethorpe and Anderby Creek progressing for further assessment.
- Emerging preferences for the marine route alignments included options to route through or around the Holderness Offshore Marine Conservation Zone.

2.3.10 The English Offshore Scheme was not formally consulted on during the non-statutory consultation in 2024 due to this being progressed under a separate consenting regime at that time. However, information with respect to the marine route alignments was provided during the non-statutory consultation for the context of the wider scheme.

2.4 Design Development since Non-Statutory Consultation

2.4.1 The feedback received during the non-statutory consultation has been carefully reviewed and considered, informing the ongoing technical work on the design and the EIA process. Since the non-statutory consultation, the following key changes to the design have been made:

- Further studies and discussions with the National Energy System Operator have confirmed that the Lincolnshire Converter Station to the northeast of Bilsby (and the associated three ended connection) are not required as part of the Projects and therefore no longer form part of the design.
- Anderby Creek has been identified as the Preferred Landfall location. The landfall at Theddlethorpe no longer forms part of the design.

2.4.2 In addition to these changes, the design of the English Onshore Scheme has been developed to include more detail, such as access and compounds for the construction works. For the English Offshore Scheme, the cable routes have also been considered in more detail. Further information on the development of the Projects design since non-statutory consultation can be found in **Volume 1, Part 1, Chapter 3 Reasonable Alternatives Considered**.

2.4.3 Although EGL 3 and EGL 4 would be independent of one another and are two separate projects, the components of the Projects within the English Onshore Scheme are being designed in parallel with the underground cables located next to each other and the converter stations in close proximity. This approach is being taken to reduce the extent of potential impacts and disturbance upon local communities and the environment, for example, through the Projects sharing some elements such as construction compound and haul routes.

2.4.4 The Projects and the draft Order Limits upon which the preliminary assessments have been undertaken are described in **Section 3**.

2.4.5 Consultation feedback received during statutory consultation will be reviewed and changes to the design of the Projects considered to address the concerns and issues raised through the feedback.

3. Project Description

3.1 English Onshore Scheme: Permanent infrastructure

3.1.1 The English Onshore Scheme would comprise the construction of:

- EGL 3 Project:
 - a landfall point at Anderby Creek on the Lincolnshire coastline;
 - 100 km of underground HVDC cable;
 - a new EGL 3 converter station, close to the existing Walpole substation;
 - up to 5 km of underground HVAC cable;
 - a single new 400 kV substation at Walpole; and
 - works to an existing 400 kV overhead line at Walpole.
- EGL 4 Project:
 - a landfall point at Anderby Creek on the Lincolnshire coastline;
 - 100 km of underground HVDC cable;
 - a new EGL 4 converter station, close to the existing Walpole substation;
 - up to 5 km of underground HVAC cable;
 - a single new 400 kV substation at Walpole (this is the same substation referred to above for EGL 3); and
 - works to an existing 400 kV overhead line at Walpole (these are the same overhead line works referred to above for EGL 3).

3.1.2 The new 400kV substation at Walpole would then connect to the wider electricity transmission network. The new substation is referred to as 'Walpole B Substation' in the PEIR and wider consultation material.

Walpole Converter Stations

- 3.1.3 The Walpole converter stations would house electrical equipment to facilitate the conversion of electricity between alternating current (AC) and direct current (DC), depending on the flow of and demand for electricity.
- 3.1.4 Each converter station would sit on a platform approximately 350 m by 250 m upon which there would be a number of buildings and equipment up to 30 m in height. The area around the converter stations would include security fencing and lighting, permanent access roads and drainage. Although not yet incorporated into the design, it is likely there would be measures such as planting, to help screen the converter stations in views. The converter stations would not be manned on a permanent basis, but regular maintenance visits would take place.
- 3.1.5 At this stage in the Projects, four potential options (Options A to D) have been identified for the locations of the converter stations, and all four options have been considered as

part of the PEIR. Where the assessment has identified differences in the potential effects from the four converter station options this has been made clear in **Chapter 5**. Only one option will be taken forward into the DCO. The options comprise:

- Option A: One converter station located to the east of Ingleborough, with an access road from Mill Road and one located to the west of West Drove North and east of the existing operational Rose and Crown Farm Solar Farm, with an access road from West Drove North. The platforms that the converter station buildings are located on would be, as a minimum, approximately 700 m apart.
- Option B: Both converter stations would be sited together to the west of West Drove North, east of the Rose and Crown Farm Solar Farm. Each converter station would have its own access road from West Drove North.
- Option C: One converter station located to the west of West Drove North, east of the Rose and Crown Farm Solar Farm, with an access road from West Drove North and one converter station located to the east of the River Nene, northwest of Ingleborough, with an access road from Mill Road. The platforms that the converter station buildings are located on would be, as a minimum, approximately 1.8 km apart.
- Option D: One converter station located to the east of Ingleborough, and one located to the east of the River Nene, northwest of Ingleborough. The platforms that the converter station buildings are located on would be, as a minimum, approximately 580 m apart. Each converter station would have its own access road from Mill Road.

3.1.6 The layout of these four options is shown in **Figures 3-1 to Figures 3-4**, with Sheet 1 of each figure showing temporary works and Sheet 2 showing permanent infrastructure. The figures are presented in the separate NTS Figures document.

Anderby Creek Landfall

3.1.7 The landfall is the term commonly used to describe the location where the onshore and offshore cables meet. The onshore and offshore cables would be of different dimensions and would be connected within a transition joint bay (a point where the offshore cable transitions into the onshore cable), which is a permanent underground chamber used to connect the sections of cables. The land at the transition joint bay at the landfall would be raised, however, there would be no permanent above ground works other than a cover, at ground level. The landfall is shown on Sheet 1 of **Figure 3-5** (temporary components) and **Figure 3-6** (permanent components), presented in the separate NTS Figures document.

Underground cables

3.1.8 The HVDC cables would connect from the landfall to the converter stations. For each Project, there would be two HVDC cables in one trench (four cables in two trenches in total for both EGL 3 and EGL 4) buried underground within cable ducts.

3.1.9 The HVAC cables would connect the converter stations with the new Walpole Substation. For each Project, there would be two trenches, with three HVAC cables within each trench. In total, for both EGL 3 and EGL 4 this would mean four trenches and 12 cables.

3.1.10 Both the HVDC and HVAC cables would be installed in sections from underground cable joint bays, a type of underground chamber where sections of cable are connected

and installed. There would be an underground cable joint bay every 800 m to 1.5 km along the cable route.

- 3.1.11 The depth of the HVDC and HVAC cables would vary, subject to location and agreement with relevant stakeholders. However, the minimum depth between the ground surface and the tiles which protect the below ground cables would be 900 mm in areas of agricultural land and open countryside. Where justified, for example, due to underlying geology or soil conditions, cables may be laid deeper, typically to a depth of 1.2 m to the protective tile. The depth of installation would also be deeper at locations the cables need to pass under features such as major roads or rivers.
- 3.1.12 There would be no permanent above ground infrastructure required along the new HVDC cables route except for small marker posts, to alert people that there is a high voltage cable underneath the ground. Link pillars would be installed along the HVAC cable route at the underground cable joint bays. The link pillars would have a typical footprint of 0.5 m by 1.2 m with a height of 1.3 m.
- 3.1.13 At this stage in the Projects, there are four potential locations where there are alternative cable routes. All options have been considered as part of the PEIR but at each location only one cable route will be taken forward into the DCO. The options comprise:
- North of Sibsey: Two options have been identified; the Northern Option and Southern Option. Both options have been taken forward to allow for flexibility in the crossing of A16 Main Road. Both options are shown on sheet 4, **Figures 3-5 and 3-6** in the separate NTS Figures document.
 - North of Cowbridge: Two options have been identified; the Northern Option and the Southern Option. Both options have been taken forward to allow for flexibility in the crossing of West Fen Drain. Both options are shown on sheet 4, **Figures 3-5 and 3-6** in the separate NTS Figures document.
 - Hubberts Bridge, west of Boston: Two cable route options have been identified; the Eastern Option and the Western Option. Both options have been taken forward to avoid a potential area of historic settlement remains and a Grade II listed milepost, and to allow for additional flexibility for the river crossing. Both options are shown on sheet 5, **Figures 3-5 and 3-6** in the separate NTS Figures document.
 - River Nene crossing, Foul Anchor: Three options have been identified; a Northern Option, Central Option and Southern Option. Feedback from the 2024 non-statutory consultation feedback and ongoing work has identified that there are a number of existing and proposed developments in this area east of the River Nene and in the areas around Walpole Marsh. Therefore, these options have been included to avoid these existing and proposed developments. All options are shown on **Figures 3-1 to 3-4** in the separate NTS Figures document.
- 3.1.14 **Figures 3-5 and 3-6**, presented in the separate NTS Figures document, show the temporary and permanent features of the underground cables for the English Onshore Scheme.

New 400 kV Walpole Substation

- 3.1.15 To connect the Projects into the National Electricity Transmission System, a new 400 kV substation (Walpole B Substation) in the vicinity of the existing Walpole substation would be required.

- 3.1.16 The Walpole B Substation would be required to connect National Grid's Grimsby to Walpole Project, the EGL 3 Project and the EGL 4 Project to the National Electricity Transmission System and would therefore serve as a common and single connection point. The need for the Walpole B Substation exists as a part of either EGL 3 and EGL 4 or the Grimsby to Walpole Project and therefore will form part of the design for all of these projects and consent for the Walpole B Substation will be sought in both the EGL 3 and EGL 4 DCO and the Grimsby to Walpole DCO.
- 3.1.17 The existing Burwell Main to Walpole 420 kV overhead line would also need to connect into the Walpole B Substation. A short section of the existing overhead line would be permanently diverted to connect into the proposed Walpole B Substation. Two existing pylons would need to be removed and up to four new pylons installed. A cable sealing end compound (similar to pylon) would be installed close to the existing overhead line and would connect one of the existing overhead line circuits onto a short run of new 400 kV single circuit underground cable into the proposed Walpole B Substation.
- 3.1.18 The layout and location of the Walpole B Substation is shown in **Figures 3-1 to Figures 3-4**, presented in the separate NTS Figures document.

Environmental measures

- 3.1.19 The English Onshore Scheme also includes opportunities for environmental mitigation (referred to as 'design' and/or 'control measures', or collectively 'environmental measures' in the PEIR), compensation, and enhancement (which could include hedgerow creation, native tree planting or funding local wildlife groups).

3.2 English Offshore Scheme: Permanent infrastructure

- 3.2.1 The key elements of the English Offshore Scheme are summarised below:
- EGL 3 Project:
 - Approximately 436 km of subsea HVDC cable from the landfall at Anderby Creek, Lincolnshire, England, to where it meets the marine boundary between English and Scottish waters. The subsea cable system would consist of two HVDC cables and a fibre optic cable (up to the first offshore joint) for control and monitoring purposes.
 - EGL 4 Project:
 - Approximately 425 km of subsea HVDC cable from the landfall at Anderby Creek, Lincolnshire, England, to where it meets the marine boundary between English and Scottish waters. The subsea cable system would consist of two bundled HVDC cables and a fibre optic cable (up to the first offshore joint) for control and monitoring purposes.

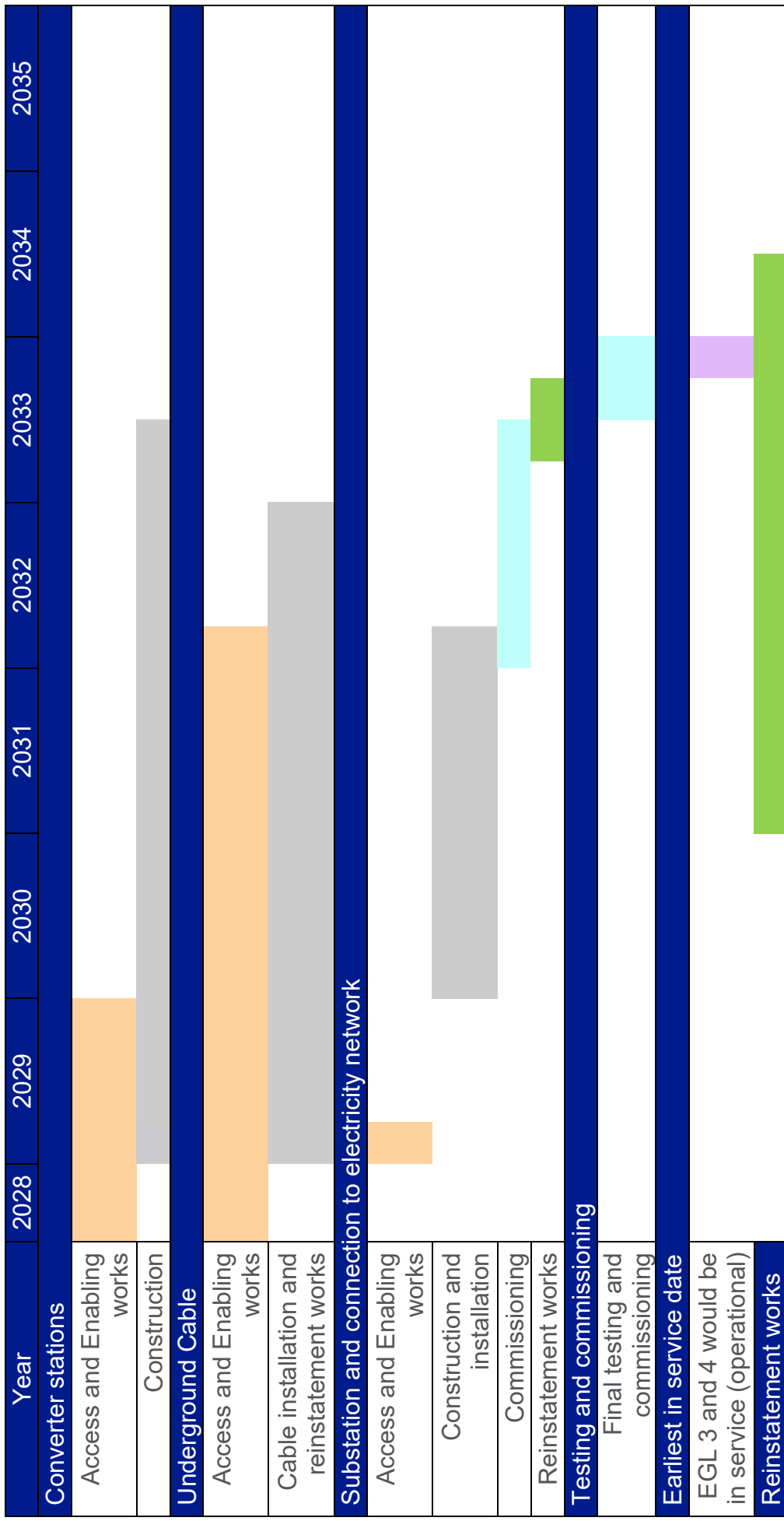
3.3 Construction Programme

- 3.3.1 The indicative construction program for EGL 3 and EGL 4 is set out below. Construction is programmed to commence during 2028, with onshore access and early enabling works, and run through to 2033, when it is expected that the Projects will be in-service and fully operational.

English Onshore Scheme

- 3.3.2 Subject to gaining development consent in early 2028, it is anticipated that access and enabling works would commence in late 2028 once any relevant DCO requirements are discharged. The DCO will set out requirements that National Grid must comply with as part of developing the Projects. Access and enabling works include activities such as site clearance, the installation of construction compounds and access roads. It is expected that the main construction works would continue through to 2033 (approximately 6 years).
- 3.3.3 Reinstatement, comprising removal of construction haul roads, construction compounds, reinstatement of subsoil and topsoil and replacement of planting, such as hedgerow, would be required following construction. However, for specific components of the Projects and at specific locations along the cable route, reinstatement would overlap with the wider construction program.
- 3.3.4 EGL 3 and EGL 4 are likely to start operating towards the end of 2033. The construction program will be developed as the Projects progress and will take account of seasonal constraints such as when protected species are breeding or hibernating and activities that could disturb these species may need to be limited.
- 3.3.5 An indicative construction program is provided below in **Table 3-1**. Further details on the phasing of the Projects will be set out within the ES.

Table 3-1 – English Onshore Scheme Construction Programme



English Offshore Scheme

- 3.3.6 The construction program for the English Offshore Scheme would be expected to take approximately 55 months, commencing in 2028/2029 for both EGL 3 and EGL 4.
- 3.3.7 Works at the landfall may commence in 2028 / 2029 ahead of the main works.
- 3.3.8 Flexibility would be required in the construction program in order to accommodate a range of uncertainties. This would include the time taken to undertake procurement activities, variable lead times for components and equipment, and variable task durations dependent on the suppliers, technologies and methodologies selected. This may be affected by factors such as supply chain bottlenecks as well as the implementation of any required mitigation measures for environmental sensitivities or sensitive receptors.

3.4 English Onshore Scheme: Construction methodology

Construction working hours

- 3.4.1 The proposed construction working hours for the English Onshore Scheme would be:
- Monday – Friday: 07:00 – 19:00; and
 - Saturdays, Sundays and Bank Holidays: 08:00 – 17:00.
- 3.4.2 Some English Onshore Scheme construction works would need to take place outside of these hours, for example, overnight. This would include works that need to take place continually until finished, for example, pouring concrete. It could also include the delivery of abnormal loads where delivering the equipment during standard working hours could cause traffic congestion because the vehicles used to deliver the equipment are slow moving. It would also include works which had started during standard working hours but finishing during these hours could cause a safety issue or emergency works which need to be completed to avoid risks to people, property or the delivery of electricity.

Access and enabling works

- 3.4.3 The initial access and enabling works that would be put in place to then facilitate the construction of the English Onshore Scheme would comprise:
- Haul routes: These would provide suitable access for the construction plant and traffic between public roads and the construction works. Following the removal of any vegetation and topsoil, which would be stored and reinstated once construction was complete, an appropriate surface would be put in place. This could be stone or interlocking panels (that form a suitable surface to drive vehicles and construction plant along). The haul routes would be fenced and would also include the installation of drainage, and where required watercourse crossings. **Figure 3-7** illustrates how a haul route with a stone surface would be built.
 - Temporary culverts and bridges: These would be put in place where the haul routes cross watercourses, with culverts used on smaller watercourses and bridges on larger watercourses.
 - Indicative zone for construction compounds and laydown areas: These would be set up at several points along the cable route, at the landfall and at the Walpole

Converter Stations and Walpole B Substation. They would be located as close to public roads as possible and with access from the existing road network. The compounds would store all materials necessary for the works, including plant, waste, cable ducts, cable drums and accessories. In addition to storage, compounds also provide a location for site offices and welfare facilities for construction workers.

Figure 3-7: Installation of a haul route with stone surfacing



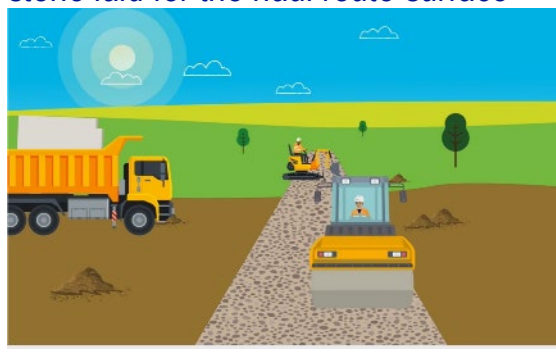
Step 1 The topsoil is carefully stripped from the land where the haul route would be built and stored whilst works take place



Step 2 A layer of synthetic material is installed to allow water to filter through the surface, and protect the subsoil from the stone laid for the haul route surface



Step 3 Highways specification stone is then laid for the haul route surface



Step 4 The haul route is then rolled and topped with a layer of smaller stones which vehicles can drive over



Step 5 Wheel washes are installed to ensure dust and soil from site does not leave

Construction of the Walpole Converter Stations

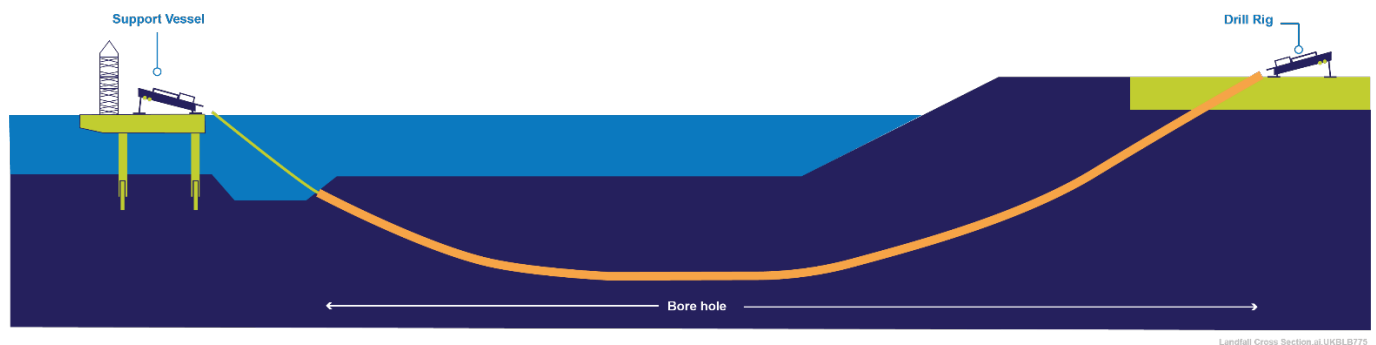
3.4.4 Following enabling works, as described above, the site of each converter station would be levelled to create a level surface and manage potential flooding. Works to improve ground conditions would take place and drainage, and utilities would be installed. There may be works to create landscape bunds for screening, but this is subject to further design work. The foundations of the converter stations would be built, and once in place the structures and buildings would be built. Once the converter stations have been built,

reinstatement works would take place, comprising the removal of the indicative zone for construction compounds and haul routes and replanting of vegetation, including any environmental measures such as planting for biodiversity and/or landscape screening.

Anderby Creek Landfall

3.4.5 Following enabling works and set up of a construction compound, the transition joint bay would be built. The cables at the landfall would be installed using a method that avoids digging open trenches (referred to as a trenchless technique) within which the cables would be laid. Various trenchless techniques exist, but most likely a form of installation known as Horizontal Directional Drilling would be used. A small hole would be drilled at the landfall, and a drill would create a path or channel underground, which is widened to allow a cable to be pulled through. The cable would run from the transition joint bay, beneath any sea defences, to a point out at sea (referred to as a 'punch out' point). At this point, the cable would then be on or within the seabed (see **Section 3.5** for more information on how cables are laid on the seabed). Once the cable was in place, the landfall area would be reinstated with an indicative zone for construction compounds and haul routes removed and ground conditions reinstated. **Figure 3-8** illustrates how cables ducts are drilled from onshore to offshore.

Figure 3-8: Installation of underground cables at landfall



Installation of underground cables

3.4.6 The route of the proposed underground cables for the English Onshore Scheme (HVDC and HVAC) would be fenced off, vegetation cleared, and within this area drainage, stockpiles for excavated topsoil and sub-soil, access or haulage road and trenches would be installed. The total width of the construction area or working width along the cable route would be approximately 76 m for HVDC cables and approximately 135 m for HVAC cables. Along much of the cable route an open cut trench, known as open cut, would be excavated. The cable would be laid in ducts, which would be laid within the trench and underground cables then pulled through the ducts from joint bays at set points along the cable route. Once cable ducts are in place the open trench would be infilled with suitable material and the ground surface reinstated to its original condition and level (unless otherwise agreed with the landowner). Further information on the detail of the trench dimensions and installation methods is provided in **Volume 1, Part 1, Chapter 4: Description of the Projects**. **Figure 3-9** illustrates how cables would be installed using open cut trenches.

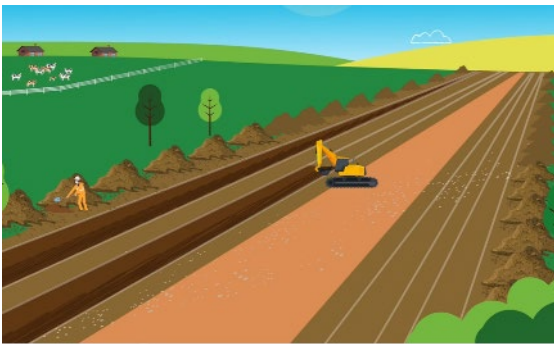
Figure 3-9: Installation of underground cables using open trenches



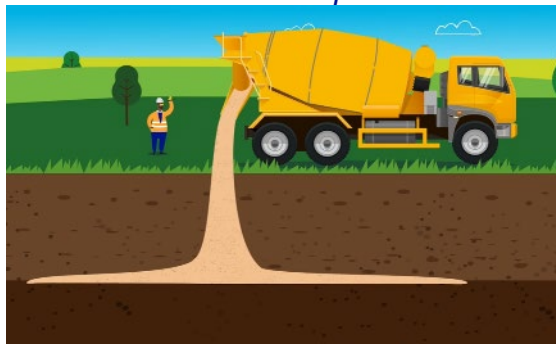
Step 1 Cables are installed in two (HVDC) or four (HVAC) trenches, adjacent to the temporary haul route



Step 2 The topsoil is carefully removed and stored separately alongside the trenches so it can be put back after the work is complete



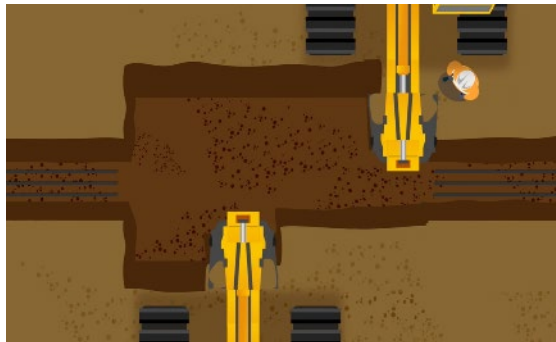
Step 3 Trenches are dug



Step 4 The trenches are filled with a mixture of sand and cement to manage the any heat transmitted from the cables



Step 5 The cables are then laid along the length of the trench within ducts



Step 6 Trenches are then joined via a wider area called a joint bay



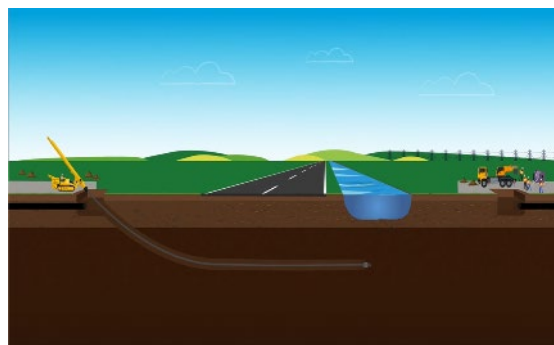
Step 7 The stored subsoil and topsoil are carefully replaced on top of the trenches and the haul roads removed. The land is reinstated and managed back to its previous condition

- 3.4.7 In some instances, open cut trenches cannot be used to install the cables or cable ducts. As with the landfall, trenchless techniques would also be used along the cable route where the cable would need to cross major rivers, roads, railway lines, flood defences or other utilities such as large gas pipelines. For this type of installation, two pits are dug on either side of the feature, under which a pathway for the cable needs to be drilled from one pit (entry) to the other side of the feature (exit). **Figure 3-10** illustrates how trenchless techniques would work.

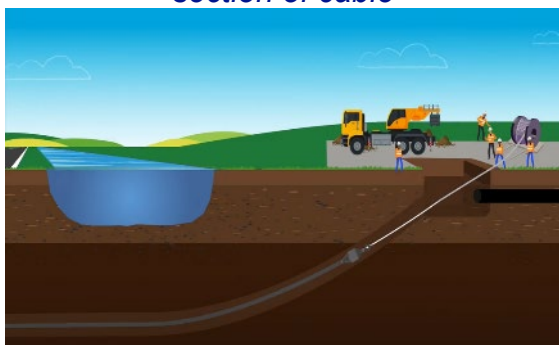
Figure 3-10: Installation of underground cables using trenchless techniques



Step 1 The topsoil is carefully removed and stored for the temporary haul route and two pits are dug either side of the section of cable



Step 2 From one pit a drilling machine that drills beneath the obstacle to the other side is launched



Step 3 A wire called a bond is attached to the drill and is pulled back to the other side of the works



Step 4 The bond is used to pull the ducts (the tubes that house the cables) through the newly drilled route



Step 5 Once complete the above ground sites are reinstated and the haul routes removed. The land is reinstated and managed back to its previous condition

Walpole B Substation

- 3.4.8 The construction of Walpole B Substation would be very similar to the construction of the converter stations. It would comprise clearance of vegetation and removal of topsoil to create a working area with enabling works such as a construction compound and haul routes set up to support the construction work. The site would be levelled and foundations put in place alongside any drainage works, permanent roads and security fencing. Structures would then be installed, and once testing had taken place, the site would be reinstated with the removal of compounds and temporary haul routes and the restoration of ground conditions.
- 3.4.9 As part of the substation works, there is a need to connect the existing 400 kV 4ZM overhead line into the substation. A temporary diversion of the 4ZM overhead line would be put in place before the substation works started so that the overhead line could still operate and ensure electricity is being transferred. The new permanent section of the overhead line connecting into the substation would be built with pylons being built and the overhead line (conductors) strung along the new section of overhead line. Once the new section of overhead line was built and connected, the diversion would be removed and any sections of overhead line and pylons not required would be removed. Once all works were completed, the construction compound and temporary haul routes would be removed and ground conditions restored.

River Nene Temporary Quay

- 3.4.10 The current design of the English Onshore Scheme includes an option to install a temporary quay on the River Nene close to where the Walpole Converter Stations and Walpole B Substation would be built. This would allow the transformer unit needed for the converter stations and other construction materials to be transported by river and sea rather than by road, potentially removing construction vehicles from public roads.
- 3.4.11 The temporary quay would be constructed by excavating the riverbank and installing a quay wall. This would create an area within the river where barges could pull in and be unloaded. Flood defences running along the riverbank would be maintained so that the flooding risk was not increased. An area adjacent to the river and temporary quay would be surfaced to allow access for construction plant and vehicles, and the installation of equipment, such as a small crane. Materials could then be unloaded from barges onto construction vehicles and transported by haul routes to the Walpole Converter Stations and Walpole B Substation without the need to travel on public roads. Once all works were completed, the area adjacent to the river and the temporary quay would be restored. The location of the temporary quay is shown on sheet 1 of each of **Figures 3-1 to Figures 3-4**, presented in the separate NTS Figures document.
- 3.4.12 **Figures 3-1 to Figures 3-6**, presented in the separate NTS Figures document, show the indicative layout of the temporary components of the English Onshore Scheme, which would be in place during construction.

3.5 English Offshore Scheme: Construction methodology

Construction working hours

- 3.5.1 For the English offshore works, including works at the landfall, construction would take place on a 24-hour basis. This would be done to minimise the total time it takes to install the English Offshore Works and enable the Contractors to make use of suitable weather windows as well as take advantage of when vessels and equipment would be available.

Construction methodology

- 3.5.2 Before the offshore cable would be installed a number of surveys would be undertaken. These would check for any changes in existing conditions on the seabed and also provide technical information needed to install the cable. The surveys would also look for any potential unexploded ordnance (explosive weapons that failed to detonate as intended and remain a hazard).
- 3.5.3 Following the completion of the surveys, the cable routes would then be prepared to make sure the equipment used to install the cables can operate efficiently and safely. This may comprise:
- Removal of boulders on the seabed using various techniques depending on the number and size of boulders present.
 - Clearance of debris from the seabed to remove any snagging risks using a technique that captures all types of debris at or just below the surface of the seabed, up to approximately 1 m depth. Such debris might comprise old cables or fishing gear.
 - Trials of digging trenches to test for the equipment used for installing the cables.
 - Pre-sweeping, which is a form of levelling of sandwaves on the seabed, to ensure the cable installation equipment can safely operate and reach the required depth of burial.
 - Preparation of crossings where the cables will need to cross existing cables such as telecommunication cables, cables connecting offshore windfarm and pipelines.
- 3.5.4 To lay the cable, the cable would be transported to the location where it was being laid, and laid from a cable lay vessel. The cable would be installed by:
- laying the cable into a pre-cut trench followed by another vessel with equipment which would then bury the cable;
 - using a technique that would create a trench and lay the cable at the same time; or
 - lay the cables onto the seabed and another vessel would later bury the cables.
- 3.5.5 In locations where the cable needs to cross existing cables or pipelines or where the required burial depth cannot be achieved, cable protection may need to be placed around the cable. This could comprise rock protection, a concrete structure which is placed over the existing cable, devices which reduce the velocity of the water as it passes the cable and encourages sediment to drop out of suspension and cover the cable or other forms of coverings. Similar to onshore, the subsea cables would be laid in sections and 'jointed' together at points along the cable route.

3.6 Operation and maintenance

- 3.6.1 For the English Onshore Scheme maintenance works would comprise:
- Inspections and repairs along the HVDC and HVAC cable routes;
 - Weekly visits by a small team to the converter stations to complete equipment inspections, services and replacements and repairs; and
 - Equipment inspections, services and replacements and repairs at the substation.

- 3.6.2 Routine maintenance of the HVDC subsea cables is not anticipated, however, the following activities may be periodically required during the operational phase:
- inspection surveys, including geophysical surveys;
 - cable repair (if required); and
 - reburial, remedial protection or maintenance and reinstatement of external cable protection features.

3.7 Decommissioning

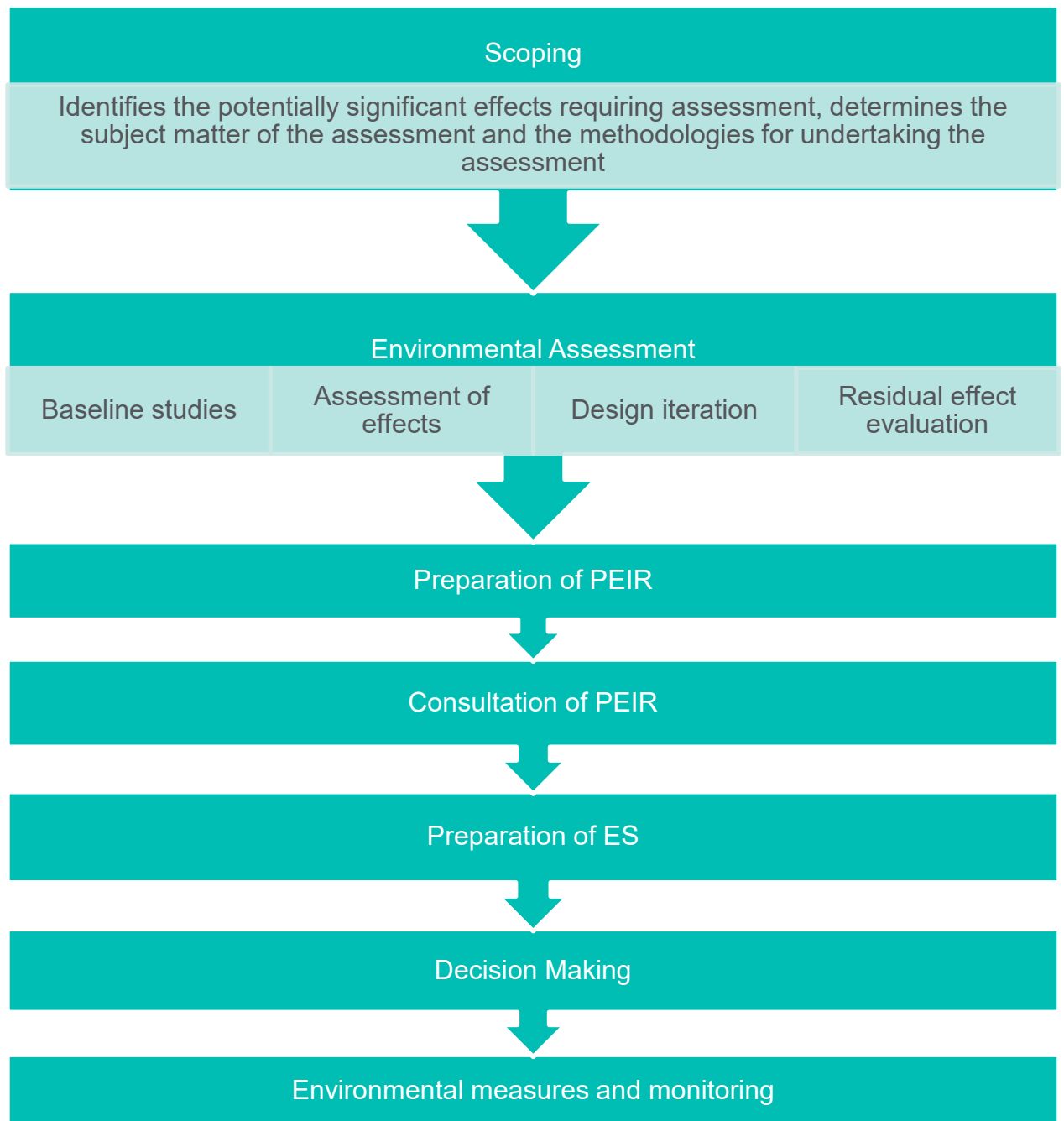
- 3.7.1 There are currently no specific plans to decommission the EGL 3 and EGL 4 Projects. It is expected that the transmission of electricity would continue for as long as there is a business case for doing so and that any decommissioning activity would occur decades into the future.
- 3.7.2 For the English Onshore Scheme in particular, the environmental impact of decommissioning cannot be fully assessed until the environmental conditions at the time of decommissioning, which may be several years into the future, are established. In any event, it is not anticipated that impacts from decommissioning would be any greater than impacts from the construction works. However, given the level of information available regarding the approach to decommissioning for the English Offshore Scheme, reasonable assumptions have been made as to the likely environmental impacts at the time of decommissioning. As such, **Volume 1, Part 3, English Offshore Scheme** has considered impacts associated with decommissioning within the technical aspect chapters. For potential impacts from decommissioning onshore, a summary is provided in **Volume 1, Part 1, Chapter 4: Description of the Projects**.

4. EIA Approach and Methodology

4.1 Environmental Impact Assessment

- 4.1.1 Environmental impact assessment (EIA) is the process of identifying and assessing the likely significant effects, both positive and adverse, of a proposed development. This involves identifying how people and the environment (identified in the assessment as specific receptors) could be affected by a development and incorporating environmental measures to avoid or minimise adverse effects or providing compensation to offset any potentially significant adverse effects. Nearly all development has some effect, but this process identifies whether these effects are likely to be significant or not, and this information is used in the decision-making process by the Examining Authority and the Secretary of State.
- 4.1.2 EIA considers all relevant environmental aspects that may be impacted, such as landscape and cultural heritage. The aspects to be scoped into the EIA were agreed with the Planning Inspectorate and other stakeholders through the EIA Scoping process.
- 4.1.3 EIA also requires the consideration of potential cumulative and interrelated effects:
- Inter-project (combined with other developments) cumulative effects; effects resulting from the Projects combining with the same type of effects generated by other developments to affect a common receptor. For example, where the effects of traffic flows during the construction of the Projects combine with traffic flows from another development undergoing construction nearby to result in potentially significant effects on local residents.
 - Intra-project (within the Projects) cumulative effects; individual environmental aspect effects resulting from the Projects, which are not significant in their own right, but combine with other environmental aspect effects from the Projects to create effects that are significant. For example, where changes in views, noise, dust and traffic related effects from the Projects construction works combine to result in potentially significant combined effects on local residents.
- 4.1.4 The EIA process is summarised in **Figure 4-1**.

Figure 4-1: The EIA process



EIA Scoping

- 4.1.5 The process of scoping and the preparation of a 'Scoping Report' is the main mechanism for determining the 'scope' of the EIA i.e., what environmental aspects will be considered, what methods of assessment will be used, and how conclusions will be reached regarding the significance of environmental effects.
- 4.1.6 A Scoping Report for the Projects was submitted to the Planning Inspectorate on 26 July 2024, and a Scoping Opinion was received from the SoS on 05 September 2024, which included comments from a range of stakeholders. The Scoping Opinion and the statutory consultee responses have subsequently informed the assessment work and further design evolution undertaken to date.

Informal consultation and engagement

- 4.1.7 Central to the delivery of the EIA has been, and will continue to be, the focus on engagement with statutory and non-statutory consultees, community stakeholders, and other interested organisations and individuals.
- 4.1.8 In addition to the formal scoping process National Grid has held, and will continue to hold, informal engagement with the key prescribed consultees, as appropriate. This will allow National Grid to refine the Projects, the EIA and assist in the development of any required mitigation. Specific information on any feedback received to date is presented in the individual environmental aspect chapters of the PEIR, which include a 'Consultation and stakeholder engagement' section which provides a record of all relevant comments received in relation to that aspect.
- 4.1.9 Through the process of engagement and consultation, the aim is to reach agreement, as far as possible, with stakeholders prior to the submission of the application for the DCO. Statements of Common Ground will be developed between National Grid and relevant stakeholders to document any areas of agreement and disagreement, which will be submitted to the Planning Inspectorate and published at the point of submitting the DCO application or during examination.
- 4.1.10 Ongoing stakeholder engagement has included:
- Regular liaison with the relevant Local Authorities and the Marine Management Organisation (MMO), including strategic and aspect specific meetings; and
 - Meetings with statutory stakeholders such as the Environment Agency, Historic England, Natural England, and non-statutory stakeholders such as the RSPB and Port and Harbour Authorities, to update them on the Projects, discuss technical issues and respond to questions.
- 4.1.11 In addition, National Grid has met with the Planning Inspectorate to provide updates on scoping, the design evolution activities and the approach to the EIA.

4.2 PEIR Approach and Methodology

- 4.2.1 The PEIR presents a preliminary assessment of the likely significant environmental effects of the Projects. The PEIR has been prepared at a point in time during the EIA process when the design of the Projects is still being refined, the likely significant environmental effects are still being assessed, and potential environmental mitigation measures are still being fed back into the design.
- 4.2.2 A description of the existing 'baseline environment' has been produced for the Projects and, where appropriate the potentially affected areas around the draft Order Limits, through a combination of desk-based studies, consultation and site-specific surveys.
- 4.2.3 All 'potential effects' arising from the different stages of the Projects are identified as part of the EIA, for example, loss of habitat or change in noise levels. The assessment considers the significance of each effect on each 'receptor' (the receiving environment, such as water, air, land, or specific species). The assessment is undertaken by EIA specialists such as ecologists and archaeologists. The general approach to determining 'significance' of an effect is to consider the sensitivity of a receptor alongside the nature and severity of the change. A detailed explanation of how different effects are deemed significant for each aspect is provided in each topic chapter of the PEIR.

- 4.2.4 All potential effects are considered as part of the EIA process. However, 'likely significant effects' are the key issues that are identified when considering the type of effect and the sensitivity of the environmental receptor.
- 4.2.5 The purpose of the PEIR is to enable members of the public, consultation bodies, and other stakeholders, to develop an informed view of the likely significant effects of the Projects and comment on aspects of interest. Feedback received through the consultation process will be used by National Grid to inform the ongoing development of the Projects design, and additional measures to address any identified potentially significant environmental effects.
- 4.2.6 The full findings of the EIA process will be presented in an ES that will be submitted as part of the application for development consent.

Environmental Measures

- 4.2.7 EIA is an iterative process and opportunities for environmental mitigation, referred to as 'environmental measures' have been considered throughout the design development of the Projects and in the assessment undertaken for the PEIR where likely significant effects have been identified. Where possible, these measures have been developed with input from key stakeholders together with appropriate technical standards, policies and guidance. These environmental measures include avoidance, good practice control and management measures (included within an Outline Code of Construction Practice) and design commitments.
- 4.2.8 At this preliminary stage, the surveys and assessment work have progressed to differing degrees for different technical assessments, and environmental measures have not all been defined or designed.

4.3 PEIR Structure

- 4.3.1 The PEIR is comprised of:
- Non-Technical Summary (this report);
 - Volume 1: Main text: This has been split into four parts:
 - Part 1 Introduction sets out an overview of the Projects, an overview of the regulatory and planning context, an overview of the main alternatives considered; a description of the Projects and it also sets out the proposed PEIR approach and method;
 - Parts 2 and 3 provide the technical aspect chapters for the English Onshore Scheme and English Offshore Scheme; and
 - Part 4 of the PEIR presents potential effects which are project wide (e.g. greenhouse gas and cumulative effects).
 - Volume 2: Appendices; and
 - Volume 3: Figures.

5. Preliminary Environmental Assessment-English Onshore Scheme

5.1 Biodiversity

- 5.1.1 The biodiversity assessment completed to date is based on preliminary analysis desk study records and field surveys undertaken at the point of writing. Fieldwork to date has mostly comprised surveys to classify the habitat types within the draft Order Limits and the species which such habitats could support. Approximately 50% of the study area for the English Onshore Scheme¹ has been surveyed.
- 5.1.2 The information provided in the PEIR cannot be taken as a complete picture of the potential presence and significance of important ecological features that could be affected by the English Onshore Scheme. The majority of detailed baseline surveys are yet to be completed, and a full and final account of the ecological baseline and detailed impact assessment will be presented within the ES. Therefore, the information presented in the PEIR is purposefully and necessarily high level in terms of the assessment of impacts in the absence of full baseline information.
- 5.1.3 A total of nine internationally important designated sites are located within 10 km of or with a relevant hydrological connection to the Projects, with the closest, Greater Wash Special Protection Area (SPA), directly adjacent the landfall at Anderby Creek. Seven local and national statutory designated sites are located within 2 km; the closest of these being Willoughby Meadow Site of Special Scientific Interest (SSSI), which is partially located within the draft Order Limits (or directly bordering, depending on accuracy of mapping). A total of 16 non-statutory designated sites are located within the draft Order Limits, with a further 44 non-statutory designated sites within 2 km of the draft Order Limits. The location of these sites is shown in **Volume 3: Part 2: Figures 6-1 to Figure 6-3**.
- 5.1.4 Field surveys comprising Preliminary Ecological Appraisal (to map the types of habitat present and identify which protected species the habitats present are suitable to support), wintering bird surveys and aquatic environmental DNA (eDNA) surveys (to check for the presence of fish and other aquatic species) have so far been undertaken to inform the English Onshore Scheme (the eDNA surveys are still being analysed). These surveys commenced in August 2024 and are currently on-going.
- 5.1.5 The majority of the landscape is arable cropland, interspersed with other habitats such as neutral grassland. Field boundaries largely comprise ditches, including several larger drains and a number of Main Rivers, many of which are heavily managed. There are relatively few ponds overall in the landscape and largely limited areas of scrub and woodland cover. Desk study information indicates further pockets of notable habitat such as lowland meadow and saltmarsh.
- 5.1.6 The largely agricultural landscape supports a range of waders, geese, other waterbirds and birds of prey (including species for which internationally important nature conservation sites are designated, known as SPA and Ramsar qualifying species)

¹ draft Order Limits for the English Onshore Scheme plus 50 m.

during the winter and will likely support a range of farmland breeding bird species. Surveys at the Anderby Creek Landfall location have recorded a range of birds on the relatively narrow area of intertidal habitats (and out to sea) as well as on fields immediately inland, including waders, geese, ducks, other waterbirds and birds of prey.

- 5.1.7 The land within the draft Order Limits has the potential to (and/or does) support a number of protected and/or notable species, many of which will be subject to further surveys throughout 2025 including bats, badgers, otter, water vole, amphibians including great crested newt, fish, white-clawed crayfish, and terrestrial and aquatic invertebrates.
- 5.1.8 The potential impacts of the English Onshore Scheme mostly result from construction works, with operational impacts limited to environmental changes relating to disturbance associated with permanent infrastructure only, including two new converter stations and a new substation at Walpole. Potential impacts can be broadly categorised into: habitat loss, degradation and fragmentation (i.e., break up or separation) of habitats, disturbance to and displacement of protected and/or notable species (from light, noise, vibration, movement of traffic and people), direct mortality of protected and/or notable species, changes to watercourses and air quality which can then affect habitat and protected and/or notable species, introduction or spread of invasive, non-native species and pollution events.
- 5.1.9 As baseline survey data collection progresses, this will continue to inform the design to avoid impacts wherever possible through alterations to the Projects design, including construction methods. Environmental measures have already been outlined to minimise the risk of impacts to biodiversity, and mitigation will continue to be developed following further baseline survey data collection and consultation with stakeholders.
- 5.1.10 In the absence of a full ecological baseline at this PEIR stage, it is considered too early to make meaningful conclusions about the effects on biodiversity and their significance for most ecological features without heavy reliance on assumptions and/or caveats. A preliminary assessment of biodiversity effects has only been presented where appropriate and where confidence exists at this PEIR stage. This has included the following:
- **Candlesby Hill SSSI and Willoughby Wood SSSI:** Given the distance of the SSSIs from the draft Order Limits (approximately 0.34 km and 0.44 km respectively), no direct impacts within the boundaries of the SSSIs would occur and indirect impacts at this distance are also unlikely to result in potential significant effects with the implementation of best practice and embedded environmental measures. As such, with the exception of effects associated with air quality (as the affected road network is yet to be defined), effects to Candlesby Hill SSSI and Willoughby Wood SSSI associated with construction of the English Onshore Scheme are predicted to be negligible.
 - **Designated sites for nature conservation:** based on the Zones of Influence (Zols) of the English Onshore Scheme, it is anticipated that there would be no potentially significant construction stage effects on local and national statutory and non-statutory designated sites for nature conservation beyond 500 m from the draft Order Limits.
 - **Reptiles:** based on habitat suitability established from field survey data collected to date and desk study analysis of those land parcels not yet visited, along with the implementation of embedded environmental measures (including precautionary

working methods during site clearance), potentially significant effects upon reptiles are not anticipated as a result of the construction of the English Onshore Scheme.

- **Terrestrial invertebrates:** based on habitat suitability established from field survey data collected to date and desk study analysis of those land parcels not yet visited, habitats mainly comprise arable farmland (which has negligible or low importance for terrestrial invertebrate assemblages). There is a limited distribution of habitats that are likely to support a terrestrial invertebrate assemblage of high value. As such, potentially significant effects upon terrestrial invertebrates are not anticipated as a result of construction of the English Onshore Scheme.
- **Invasive non-native species (INNS):** with the implementation of embedded environmental measures (biosecurity controls) during construction, potentially significant effects as a result of the spread of INNS are not anticipated.

5.2 Cultural Heritage

- 5.2.1 Information on the cultural heritage baseline was based on the results of preliminary desk-based research, which involved the collation of data from a range of sources including the National Heritage List for England (NHLE), Lincolnshire County Council Historic Environment Record (HER), Norfolk HER, initial analysis of historic mapping, and initial analysis of remote sensing data. The requirements of national and local planning policy and professional guidance were also considered in the assessment.
- 5.2.2 The study area for the cultural heritage assessments includes land within the draft Order Limits and a buffer of 500 m from this boundary. The proposed landfall location is at Anderby Creek on the Lincolnshire coast of the North Sea. The study area is rural and is largely a mix of arable and pasture agricultural land, with settlements being dispersed. There are a total of 1,150 heritage assets in the study area, of which 107 are designated. The scheduled monuments include churchyard crosses, a motte, a windmill, and a shrunken village. There are also 96 listed buildings, including churches, farmhouses and farm buildings, one Grade II Registered Park and Garden at Gunby Hall, and four conservation areas. There are no World Heritage Sites within the study area. Further information about cultural heritage features is shown in **Volume 3, Part 2: Figures 7-1 to 7-3**.
- 5.2.3 Non-designated assets vary across the study area, ranging in date from early prehistoric find spots, to assets of modern date related to World War II. As well as evidence for settlement and burial activity, there are also sites related to the fenland drainage improvements in the 17th and 18th century.
- 5.2.4 Engagement has taken place with Historic England, Lincolnshire County Council, Heritage Lincolnshire and Norfolk County Council. This engagement has helped define the key considerations for assessing potential significant effects on heritage assets

Effects during construction

- 5.2.5 There will be a potentially significant effect on a medieval moated site, currently being considered for designation, located on West Drove North to the northeast of Walton Highway. There will be a moderate adverse effect on this asset during construction caused by an increase in traffic within the setting of the asset. A number of non-significant impacts have also been identified on designated assets as a result of construction activity within the setting of these assets. These include Ingleborough Mill, also known as Inglethorpe Mill (NHLE 1077675), Shepherds Cottage (NHLE 1264180),

Faulkner House (NHLE 1237331), and the Church of St Mary (NHLE 1077676) and Bell Tower (NHLE 1171875).

- 5.2.6 The construction phase will physically impact a number of non-designated heritage assets, most of which are not considered to be potentially significant. There will be potentially significant impacts on Roman settlement sites, salterns, enclosures and associated field systems, RAF Sutton Bridge, the possible route of a pilgrim's way, and early medieval to medieval settlement activity.

Effects during operation

- 5.2.7 There will be operation phase impacts on assets around the Walpole substation and converter stations, caused by the presence of infrastructure in the landscape, and lighting of the substation and converter stations. However, these are not likely to be significant. In respect of the Possible Converter Station sites:

- 5.2.8 Impacts from Option A include:

- Minor adverse on the Grade II listed Inglethorpe Mill (NHLE 1077675).
- Minor adverse on the Grade II listed Faulkner House (NHLE 1237331).
- Minor adverse on the Grade I listed Church of St Mary (NHLE 1077676) and its separate bell tower (NHLE 1171875).

- 5.2.9 Impacts from Option B include:

- Minor adverse on the Grade II listed Faulkner House (NHLE 1237331).

- 5.2.10 Impacts from Option C include:

- Minor adverse on the Grade II listed Inglethorpe Mill (NHLE 1077675).
- Minor adverse on the Grade II listed Faulkner House (NHLE 1237331).

- 5.2.11 Impacts from Option D include:

- Minor adverse on the Grade II listed Inglethorpe Mill (NHLE 1077675).
- Minor adverse on the Grade II listed Faulkner House (NHLE 1237331).
- Minor adverse on the Grade I listed Church of St Mary (NHLE 1077676) and its separate bell tower (NHLE 1171875).

5.3 Landscape and Visual Amenity

- 5.3.1 A desk study has been undertaken to inform the preliminary assessment of effects on the character of the landscape, which takes account of the patterns and individual combinations of features in the landscape, such as hedgerows, field shapes, woodland, land use, patterns of settlements and dwellings, that make each type of landscape distinct. The preliminary assessment has also looked at how the Projects could impact people's views (referred to as visual assessment). Walkover surveys have been completed to understand the key landscape qualities that might be affected by the Projects.

- 5.3.2 The study area for the landscape and visual assessment includes:

- An area of 2 km from the draft Order Limits from Anderby Creek Landfall to the River Nene, where the English Onshore Scheme only comprises underground cables. This

has been extended to an area of 3 km where the draft Order Limits overlap with the Lincolnshire Wolds, which is a designated landscape.

- An area of 3 km from the draft Order Limits from the proposed indicative zone for the converter stations (the term used to describe the area around the converter stations and new Walpole Substation).

- 5.3.3 The landscape within the study area is predominantly flat and low-lying. Towards the coastline, there are coastal marshes and undulating marshland. Further inland and to the south, the land gradually rises, giving way to undulating marshland. The Lincolnshire Wolds most lies outside of the draft Order Limits but at this location the landscape changes from a flat and open landscape to the ridges, valleys and scarps of the Lincolnshire Wolds. Much of the land within the draft Order Limits is farmed for arable agriculture with limited built-up areas. Dispersed villages, hamlets, and isolated farms are present throughout the draft Order Limits. Many of the fields in the marshlands or fenlands are bordered by drainage ditches and trees and woodland are generally limited through the draft Order Limits. Given the low-lying nature of the landscape within the draft Order Limits, there are streams, rivers, drainage ditches and canalised waterways to manage water and flooding.
- 5.3.4 Landscape character is defined at a local, regional, and national level. There are several National Character Areas (NCAs) in the study area but most of the land within the draft Order Limits falls within either the Lincolnshire Coast & Marshes (NCA 42) or The Fens (NCA 46). Landscape character types across the Projects are shown in **Volume 3, Part 2: Figures 8-1 to Figure 8-2**.
- 5.3.5 A small part of the Lincolnshire Wolds falls within the draft Order Limits. A national landscape is an area recognised for its natural beauty, cultural significance, and ecological importance. National landscapes are protected for the nation's benefit and managed to preserve their unique features for the enjoyment and benefit of the public.
- 5.3.6 Visual receptors within the study area have been identified as residents within settlements and residents of scattered dwellings and farmsteads. This also includes 'recreational receptors' such as people using national cycle routes, walkers on long distance paths or the coastal path as well as those using beaches close to the landfall or staying at caravan parks or holiday homes within the study area. Such receptors also include visitors to attractions such as Gunby Estate Hall and Gardens and Kelsey Wood Country Park. Transport network receptors include people travelling in vehicles along roads and passengers on trains within the study area.
- 5.3.7 A number of environmental measures are proposed to mitigate the effects of the English Onshore Scheme on landscape character and people's views. Such measures include keeping existing vegetation within the draft Order Limits and replacing any trees lost with suitable planting. During construction, measures to protect trees and hedgerows will be implemented in line with British Standards. A Landscape and Ecology Management Plan (LEMP) and Outline Code of Construction Practice (CoCP) will also be put in place to ensure proper soil handling, vegetation reinstatement, and monitoring. Finally, the converter stations will be designed to be sympathetic to the local landscape character, for example, with buildings clad in appropriate materials and colour tones.

Landscape effects

- 5.3.8 There would be likely significant effects on the landscape character during construction as a result of changes in the landscape from the removal of vegetation and the presence of construction activities and machinery. Effects would be localised (i.e. the

changes would not affect the entire landscape character area or type due to its size and location), and a number of local landscape character areas would experience temporary significant adverse effects as well as the Lincolnshire Coast and Marshes National Character Area (NCA) and The Fens NCA.

- 5.3.9 The landscape assessment looks at the potential effects that could occur one year after construction was complete and 15 years after construction to take account of how any measures, such as replanting of trees may change effects once established. The assessment has shown that 15 years after construction, the only potentially significant adverse effects on the landscape that would remain would be on the local landscape character area within which the Walpole Converter Stations and Walpole B Substation would be located (Terrington St. John LCA). The remainder of the English Onshore Scheme would comprise an underground cable, and after 15 years vegetation will have regrown, and the ground conditions restored to their original use.
- 5.3.10 Only Options C and D for the Walpole Converter Stations are likely to result in permanent significant adverse effects on the character of the landscape. For both of these options a greater amount and extent of environmental measures, such as tree planting, would be required to mitigate the effects from the converter stations. These environmental measures likely to be needed would permanently alter the character of the landscape.
- 5.3.11 There would be no potential significant effects on the Lincolnshire Wolds. Compared to the overall extent of the National Landscape the part of the National Landscape impacted would be small and construction works would be small in scale and size, and short term and temporary in nature. Once construction works were complete there would be no significant effects as the Projects would comprise an underground cable at this location and therefore would be very few signs of development above ground during operation.

Visual effects

- 5.3.12 At this stage of the Projects, a precautionary approach has been undertaken to assessing visual effects. Therefore, potentially significant adverse effects are considered likely on receptors with views of the construction works and permanent above ground elements of the English Onshore Scheme as follows:
- Residential receptors within 250 m as construction works or permanent above ground elements are likely to be highly visible in views and the removal of vegetation may also open up views of the construction works.
 - Residential receptors 500 m to 600 m (potentially up to 1 km away) where the character of the landscape is open and therefore, views of construction works or permanent above ground elements may be visible over a greater distance.
 - Recreational receptors within 500 m that may have views of the construction works or permanent above ground elements, especially as moving closer to the construction works.
- 5.3.13 At the location of the Walpole Converter Stations and Walpole B Substation, a type of mapping, known as a Zone of Theoretical Visibility, has also been produced to identify the area over which the converter stations could be visible from based on the heights of the converter stations (30 m). This has also been used to assess permanent effect on views.

- 5.3.14 A number of residential and recreational receptors would experience temporary adverse effect on views during the construction of the landfall, underground cables, converter stations and Walpole B Substation. Fifteen years after construction works were complete and vegetation has re-established there would be no significant effects on views from the landfall or underground cables and there would be limited above ground infrastructure. However, there would be permanent significant effects on receptors in the area around the Walpole Converter Stations and Walpole B Substation.

5.4 Water Environment

- 5.4.1 A desk study has been undertaken to inform the preliminary assessment, supported by data collected from several stakeholders and by information gathered during site walkovers conducted in September 2024.
- 5.4.2 The study area for the water environment includes land within the draft Order Limits, and, in addition, a buffer of 500 m from this boundary. The proposed landfall location is on the Lincolnshire coast of the North Sea. The major rivers (known as main rivers) in the study area include the River Witham, River Welland and River Nene. There are also numerous tributaries of these rivers, classified as ordinary watercourses.
- 5.4.3 Land drainage in large parts of the study area is managed by Internal Drainage Boards, and many of the watercourses in the study area have been modified for land drainage and flood defence purposes.
- 5.4.4 Watercourses in the study area receive, transport and dilute consented and informal discharges and support abstractions of water for a range of uses.
- 5.4.5 The study area crosses multiple catchments of Water Framework Directive (WFD) waterbodies and is located within the Anglian River Basin District. The majority of the surface waterbodies have an ecological status of moderate, and all have a chemical status of fail.
- 5.4.6 At the proposed landfall location, the draft Order Limits cross large extents of coastal floodplain, which is defended from regular inundation by embankments and dunes. For the rest of the study area (landfall to and including the indicative zone for the converter stations), the draft Order Limits also cross large extents of floodplains that are influenced by rivers and tides and are defended, reducing the risk of flooding.
- 5.4.7 Although most of the land within the study area is shown to be at very low risk of surface water flooding (annual chance of flooding of less than 0.1%), there are isolated areas of high risk (annual chance of flooding greater than 3.3%), concentrated around land drainage pathways and watercourse channels.
- 5.4.8 Information about the water environment and areas of flood risk in relation to the Projects can be viewed in **Volume 3, Part 2, Figures 9-1 to 9-3**.
- 5.4.9 With regard to flood risk and land drainage, future baseline conditions would be forecast, drawing on current best practice guidelines taking into account the likely impacts of climate change on rainfall intensities, and where applicable, peak river flows and sea level rise. These future conditions would be considered to factor climate change resilience into the design of the English Onshore Scheme.
- 5.4.10 It is expected that the Water Framework Directive legislation will drive future improvements in the ecological and chemical quality of waterbodies. The effects of the implementation of future cycles of river basin management plans would therefore also be considered when assigning value to water environment receptors.

- 5.4.11 A range of environmental measures would be implemented as part of the English Onshore Scheme, and further information about these is provided in **Volume 1, Part 2: Chapter 9 Water Environment**. The preliminary assessment of water environment effects assumes that all environmental measures are in place before assessing the effects.
- 5.4.12 Areas protected for nature conservation interest sites which are water dependent are still to be identified and confirmed. However, effects on these receptors would be avoided or mitigated by the environmental control measures that have been identified. A full assessment of effects will be presented in the ES, informed by further data and ecology surveys. Those sites with a hydrological dependence will be included as receptors in the water environment assessment in the ES.

Effects during construction

- 5.4.13 The preliminary assessment of water environment effects has identified the potential for significant effects linked to two elements of the Projects: watercourse diversions in the indicative zone for the converter stations and construction of the River Nene Temporary Quay.
- 5.4.14 Where permanent infrastructure is proposed in the indicative zone for the converter stations, there will be a need for several ordinary watercourses or drains managed by the Internal Drainage Boards to be diverted. These watercourse diversions have the potential for significant effects on several attributes of these receptors, including water quality and their land drainage function. The magnitude of change and significance of effect assigned in this preliminary assessment (ranging from minor to moderate) will be confirmed in the ES once more detail is available on the watercourse diversion proposals. Given the number and density of local watercourses and drainage ditches, watercourse diversions will be required in the indicative zone for the converter stations for all design options. Based on the current design, watercourse diversions for Option D would impact the fewest watercourses, Option A the most, with Options B and C being broadly similar.
- 5.4.15 There is an option to create a temporary quay on the bank of the River Nene to transport construction materials along the river. The temporary quay could result in temporary effects on several features or attributes of the River Nene, with the potential for these to be significant for surface water quality and hydromorphology. It is noted that the associated magnitude of impact would depend on the quay design and degree of any dredging requirements.
- 5.4.16 There are some effects considered in the preliminary assessment that are not expected to be significant given the environmental measures that would be in place, for example, potential effects on water quality and hydromorphology at watercourse crossings.
- 5.4.17 The preliminary assessment relating to flood risk and land drainage concludes that no significant effects are anticipated, but this will be confirmed through the completion of a Flood Risk Assessment (FRA). The FRA will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea or the functioning of flood defences.

Effects during operation

- 5.4.18 The preliminary assessment of water environment effects suggests that there would be no likely significant effects during operation.

- 5.4.19 The FRA will outline the proposed mitigation measures/commitments to ensure the Projects are safe from flooding over their lifetime and that there are no detrimental effects on flood risk from rivers and the sea because of these interactions. Subject to the implementation of such measures, potential adverse effects on flood risk from rivers and the sea are expected to be not significant.
- 5.4.20 Upon completion of the Projects, the working areas would be removed, and the land within the draft Order Limits returned to its pre-construction condition. There would be permanent changes to the land at the indicative zone for the converter stations as the surfaces needed for the converter stations and substation, including access roads, would create an impermeable footprint. The designs of these elements of the English Onshore Scheme would incorporate appropriate surface water drainage measures and suitable drainage provisions would also be included for accesses. Due to the robust design and environmental measures that would be adopted, no likely significant effects on flood risk and land drainage are anticipated.

5.5 Geology and Hydrogeology

- 5.5.1 The study area for geology comprises the draft Order Limits for the English Onshore Scheme, plus a 250 m buffer. For hydrogeology, the study area comprises land directly affected by the English Onshore Scheme (draft Order Limits) plus a 500 m buffer.
- 5.5.2 A desk study has been undertaken to inform the preliminary assessment, using publicly available information and information from the Environment Agency, and Borough and District councils within the study areas.
- 5.5.3 An initial geological walkover was undertaken between the 19 – 22 November 2024.
- 5.5.4 Hydrogeological surveys will be undertaken to review receptors, ascertain their existence and use of potential water supplies. Photographic evidence is to be taken and any details on usage quantities and abstraction horizon is to be recorded.
- 5.5.5 The mapped geology along the route includes superficial geology (upper layers) of mixtures of Clay, Silt, Sand, Gravel and Peat and bedrock geology of Chalk, Sandstone, Mudstone, and Limestone.
- 5.5.6 The geology across the length of the route varies, however the main geological resource that may be impacted by the Projects are peat deposits mapped between Little Steeping and Sibsey Northlands.
- 5.5.7 The land use of the English Onshore Scheme and surrounding areas is predominantly agricultural (farmland). Features noted for having potential impact to geology include historical landfills and infilled land (e.g. ponds), former airfields, former railways and industrial land uses. Historical landfills are recorded within the English Onshore Scheme and nearby.
- 5.5.8 There are no records of pollution incidents with major or significant impact to land recorded in the English Onshore Scheme. There are records of pollution incidents with minor impact to land near the English Onshore Scheme.
- 5.5.9 Radon gas is a natural geological phenomenon to which prolonged exposure can cause health risks. Radon risk is low at the landfall and indicative zone for the converter stations and low to medium along the route of the proposed HVDC cable however, no occupied buildings are planned in this area.

- 5.5.10 Risk of unexploded ordinance (e.g. World War 2 bombs) has been assessed to be low across the English Onshore Scheme.
- 5.5.11 The English Onshore Scheme is located across two distinct hydrogeological (groundwater) environments. At the northern end of the draft Order Limits, the groundwater environment largely comprises Chalk and Greensand Principal and Secondary A and B aquifer units, which form a regionally important groundwater resource. Sensitive interactions between groundwater and surface water include the presence of baseflow fed streams and potential springs. A number of Source Protection Zones (areas identified to protect sources of groundwater for drinking water from contamination) are present associated with public groundwater abstractions within the Chalk. At the southern end of the draft Order Limits, the land is predominantly underlain by clay dominated strata, which are classified as unproductive strata for groundwater and hence have limited groundwater present. Private Water Supplies and potential springs are located along the underground cable route, and the presence and usage of any supplies will be verified by site survey prior to commencement of the ES.
- 5.5.12 Information about groundwater and geology in relation to the Projects can be viewed in **Volume 3, Part 2, Figures 10-1 to 10-8.**
- 5.5.13 Hydrogeological conditions may be prone to change because of climate change. Climate change predictions for the UK indicate a trend of wetter winters, drier summers, higher average temperatures, and higher intensity rainfall events. These could have an impact on soil erosion, groundwater levels, and indirectly (through groundwater level changes) - potential for mobilisation of contamination. Given the nature of the English Onshore Scheme, any change in baseline resulting from these factors would be unlikely to have a meaningful influence on the assessment of effects. However, this will be reviewed as part of the ES.
- 5.5.14 A range of environmental measures would be implemented as part of the English Onshore Scheme. The preliminary assessment of geology and hydrogeology effects assumes that all environmental measures are in place before assessing the effects.

Effects during construction

- 5.5.15 For geology, works during construction could disturb peat deposits and contaminated ground at localised sites (historical landfills) and create pathways for ground gas to migrate. However, with the implementation of environmental measures, including ground investigations and if needed, remediation measures before construction works start, no significant effects are likely.
- 5.5.16 For hydrogeology, no significant effects on groundwater receptors, including public and private water supplies, Water Framework Directive groundwater bodies, groundwater dependant ecological sites, and people at risk of groundwater flooding are likely during construction with the implementation of appropriate environmental measures such as measures to control and store materials on-site.

Effects during operation

- 5.5.17 The preliminary assessment of Geology and Hydrogeology effects has identified that there are no likely significant effects on geology or groundwater receptors once the English Onshore Scheme is operational. Design measures will be built into the Projects to prevent and minimise effects from the operation of the buildings and infrastructure.

5.6 Agriculture and Soils

- 5.6.1 A desk study has been undertaken to inform the preliminary agriculture and soils assessment using publicly available information. Agricultural Land Classification (ALC) and soil surveys have commenced. Whilst the information is not available for the preliminary assessment, the full survey results will be used to inform the assessment presented in the ES.
- 5.6.2 The study area for the assessment of Agriculture and Soils comprises the draft Order Limits. This is considered appropriate as no Agriculture and Soil receptors will be affected outside of the draft Order Limits.
- 5.6.3 The geology within the draft Order Limits comprises a range of rock types, with chalk present from the landfall at Anderby Creek to just north of Burgh le Marsh and then a range of other rock types, including sandstone, mudstone and siltstone from Burgh le Marsh to the indicative zone for the converter stations. The majority of these rocks are overlain by drift deposits comprising Tidal Flat Deposits (described as being clay and silt). The geology is important as it is the rock type (solid or drift) which imparts many of the characteristics of the soils which develop at the surface.
- 5.6.4 A total of 14 main groups of soils have been identified within the draft Order Limits. These largely comprise deep loamy and clay mineral soils; however, peat soils are expected to be present east of the A14 and south of Steeping River.
- 5.6.5 Available ALC mapping (a classification system used to assess the agricultural quality of land within England and Wales) indicates that the draft Order Limits are likely to comprise predominantly best and most versatile (BMV) land; this is land which falls into Grade 1, Grade 2 and Grade 3a categories.
- 5.6.6 The northern section of the draft Order Limits between the landfall at Anderby Creek and Little Steeping is largely mapped as ALC Grade 3. The central section of the draft Order Limits, between Little Steeping and Boston, is predominantly mapped as ALC Grade 2, whilst the draft Order Limits south of Boston to the indicative zone for the converter stations is comprised largely of ALC Grade 1 land.
- 5.6.7 The land use within the draft Order Limits is predominantly arable land with small areas of grassland. Field boundaries are lined with hedges, trees, drainage ditches and roads throughout the draft Order Limits and extensive areas of land within the draft Order Limits are covered by Countryside Stewardship or Environmental Stewardship Agreements, with more limited areas covered by Woodland Grant Schemes and Felling Licenses.
- 5.6.8 Information about land use, soils and agricultural land can be viewed in **Volume 3, Part 2, Figures 11-1 to 11-5**.
- 5.6.9 Whilst there could be potential changes in the future in relation to climate change, it is considered that the baseline conditions for soils and ALC grades will remain unchanged from those described in the baseline during the construction period of the Onshore Scheme.
- 5.6.10 A range of environmental measures would be implemented as part of the English Onshore Scheme. The preliminary assessment of water environment effects assumes that all environmental measures are in place before assessing the effects.

Effects during construction

- 5.6.11 The preliminary assessment of agriculture and soils effects suggests that there is the potential for there to be significant effects during construction on BMV land and on soils.
- 5.6.12 During the construction phase, there would be a potential loss of BMV land (defined as ALC Grades 1, 2 and 3a) from agricultural productivity whilst construction works take place. Whilst some land would only be required temporarily during the construction phase, given the scale of the project, it is considered that this temporary loss of land would be significant. However, this land would be reinstated following good practice guidelines by the end of the construction phase.
- 5.6.13 Some land would be required permanently, for example, for the substation and converter stations at Walpole. The extent of land required permanently is also considered likely to result in a potentially significant effect. The permanent loss of BMV land for the English Onshore Scheme as a result of the Walpole B substation, Converter Stations and permanent access routes, would range from 33.9 hectares (if Option A was selected) to 35.1 hectares (if Option D was selected).
- 5.6.14 There would be a similar effect on soils and the functions they provide as a result of both temporary and permanent land take. Whilst, where practicable, all surplus soil (as a result of permanent infrastructure) would be re-used within the English Onshore Scheme, allowing those soils to continue to function, the sensitivity of some soils (for example, peat and organic-rich soils) means the effect is considered to potentially be significant.
- 5.6.15 There are some effects considered in the preliminary assessment that are not expected to be significant given the environmental measures that would be in place, for example, potential effects on landholdings where land take is temporary and where compensation measures will be in place.
- 5.6.16 The assessment will be updated in the ES once the survey work is completed and there is data available to confirm the actual extent of BMV land and sensitive soil types affected both temporarily and permanently.

Effects during operation

- 5.6.17 During operation and maintenance, no likely significant permanent effects are expected to occur on BMV land or soils, as all infrastructure will be in place and no additional land will be required.
- 5.6.18 During operation, the buried cables would not limit agricultural activities, and any maintenance or repair works are likely to be small-scale and temporary, with works undertaken in accordance with good practice at the time of the works. An indication of typical maintenance activities will be presented where needed for the ES and the potential for impacts re-assessed.

5.7 Traffic and Transport

- 5.7.1 The preliminary assessment has considered the likely potential significant effects of the English Onshore Scheme on those using the transport network, such as pedestrians, cyclists, public transport users and vehicle drivers and passengers. Once the English Onshore Scheme is operational the volume of traffic would be very limited and associated with visits to the converter stations and substations as well as along the cable route for inspections and maintenance works. As the number of vehicles is

unlikely to impact traffic flows along the road network, a detailed assessment of traffic during the operation of the English Onshore Scheme has not been undertaken and the preliminary assessment has focused on effects during the construction phase.

- 5.7.2 The information used in the PEIR is based on a desk study and site visit in April 2024, which included a review of the overall road network, public transport and accident data from national and local government sources as well as information about the railway network. Automatic counters have been placed along roads expected to be used by construction vehicles in October, November and December 2024 to collect information about existing traffic volumes and speeds at which traffic is travelling.
- 5.7.3 The public highway network comprises the strategic road network, which is managed and maintained by National Highways and the local road network, which is managed and maintained by the relevant local highway authorities. The traffic study area comprises the road network, which is likely to be used by traffic associated with the English Onshore Scheme and any roads falling within the draft Order Limits or that may require temporary road restrictions or management schemes. The study area also includes Public Rights of Way (PRoW) and cycle routes that fall within the draft Order Limits or that might be used for construction traffic, for example, should a haul route be routed along a track which is a PRoW.
- 5.7.4 Key roads that are proposed to be used to access the English Onshore Scheme during construction include A17, A47, A16 and A158. Other roads that construction traffic is likely to travel along include the A1104, A47, B1195, B1185, A1121, A54, B1391, B1357, B1165, B1515, B1390, A1101 and A151. There may also be a need to use smaller connecting “C” and “U” class roads. However, an access strategy has been developed, which aims to avoid residential areas and narrow roads and has looked at road safety issues to avoid access where there is poor visibility for turning vehicles and to avoid traffic turning right across the flow of traffic. The construction access routes are also shown in **Volume 3, Part 2: Figure 12.4 Traffic and Transport - Construction Access Routes**.
- 5.7.5 Information obtained from the Department for Transport has identified a number of accidents that have occurred on the highway network surrounding the English Onshore Scheme. The data identifies where ‘clusters’ of accidents have occurred. Within the study area, these have been identified on the A52/A16 roundabout within Boston, at points along the A52, along the A16 in Kirton and at the A17/A47 roundabout. The location of all collisions are shown in **Volume 3, Part 2: Figure 12.5 Traffic and Transport – Personal Injury Collisions**.
- 5.7.6 The English Onshore Scheme potentially affects a number of Public Rights of Way. The traffic and transport preliminary assessment has identified approximately 40 Public Rights of Way that are likely to be well used and could be impacted. There is also one long distance cycle route (National Cycle Network Route 1), a long-distance route running in sections from Dover to the north of Scotland, as well as a local cycle route (‘the South Wolds Cycle Route’) which are also potentially affected by the construction of the English Onshore Scheme. These are shown in **Volume 3, Part 2: Figure 12.2 Traffic and Transport – Public Rights of Way and Figure 12.3 Traffic and Transport – National Cycle Network**.
- 5.7.7 The English Onshore Scheme crosses the Grantham to Skegness rail line, known as the ‘Poacher line’. Passenger services operating along the Poacher Line are operated by East Midlands Railway and operate approximately hourly. The railway line would not be directly impacted by the English Onshore Scheme. There is also one navigable waterway, the River Nene, located within the draft Order Limits.

- 5.7.8 A range of environmental measures relating to transport network users will be incorporated into the English Onshore Scheme. Examples include the following:
- Preparation and implementation of an Outline Construction Traffic Management Plan that will include construction traffic management measures and controls on construction vehicle types, hours of site operation and delivery routes for goods vehicles.
 - A monitoring and reporting system which will check that the Principal Construction Contractor(s) are complying with the measures set out in the Outline Construction Traffic Management Plan.
 - A booking system to control timing of deliveries, if needed, to ensure construction traffic vehicles are minimised during peak traffic periods.
 - Preparation and implementation of an outline Public Rights of Way Management Plan that includes measures to manage and mitigate effects on the Public Rights of Way network, such as diversion routes.
- 5.7.9 Based on the proposed location and layout of English Onshore Scheme at this stage, plus the incorporation of appropriate environmental measures, there is the potential for significant effects on the following roads as a result of the construction traffic.
- some sections of the A16, A1104, A47, A1121 and A52;
 - B1165 Austendyke Road, southwest of Moulton;
 - Scarborough Bank, northeast of Stickney and northwest of Midville;
 - Punchbowl Lane, northwest of Boston;
 - Bullock's Short Gate, southwest of Gedney Broadgate;
 - Lynn Road, south of Walton Highway and northeast of Wisbech; and
 - West Drove North, north of Walton Highway and south of Walpole St Peter.
- 5.7.10 These effects are unlikely to occur for the full duration of the construction programme and construction traffic flows will 'peak' in certain areas, for example as the construction workforce moves along the route of the underground cables. The types of effects that could occur include delays to drivers as well as a number of effects on pedestrians, for example if the flow of traffic increases and this increases the time needed to cross roads and fear and intimidation effects.
- 5.7.11 Further work will be undertaken to support the transport assessment that will be presented within the ES. This will include further engagement with relevant stakeholders, and further baseline gathering, including additional traffic surveys. The results from these surveys will be used to update the understanding of current traffic movements. This will also include further work to look at how many construction vehicles could be removed from the local highway network if the temporary quay was used in the construction of the English Onshore Scheme.

5.8 Noise and Vibration

- 5.8.1 Current legislation and planning policy and desk study information have been used to inform the assessment of noise and vibration effects. Such effects are likely to result from noise and vibration from construction machinery and traffic, and once the Projects

are operating from machinery and equipment within the converter stations and substation.

- 5.8.2 Specific study areas have been defined for the different types of noise and vibration effects.
- 5.8.3 No noise monitoring has been undertaken to support the PEIR, with the current baseline noise climate described subjectively taking into account Department for Environment, Food and Rural Affairs' Noise Mapping and commercial aerial photography. The study area is predominantly rural with minimal large infrastructure, and noise levels are expected to be generally low, except near transport links like A-roads and railways; future baseline noise levels are expected to increase over time due to natural traffic growth and new developments.
- 5.8.4 A range of environmental measures will be implemented to mitigate noise and vibration effects; these include design measures and control and management measures. Best Practicable Means will be used for the control of construction noise and vibration. Operational noise will be controlled through design measures, including undergrounding of cables, and all above-ground infrastructure will be designed to minimise noise and vibration impacts.
- 5.8.5 The preliminary assessment of construction activity noise concludes a potential for significant adverse noise effects during the core construction working hours, evident from the information provided during the "*haulage road installation*" works along the English Onshore Scheme; with all other construction phases and activities unlikely to result in significant adverse effects. Best Practicable Means would be implemented to further reduce these effects to a minimum.
- 5.8.6 The preliminary assessment of construction traffic noise during the peak traffic year concludes that the majority of road links within the study area would not experience any significant adverse effects. However, measures implemented under the Outline Construction Traffic Management Plan would be implemented to control road traffic noise impacts.
- 5.8.7 The preliminary assessment of construction vibration concludes no potential for significant adverse effects based upon the information supporting the PEIR.
- 5.8.8 The preliminary assessment of operational noise is limited to the equipment within the converter stations and substation. However, as the layout of these components and equipment details had not been finalised at the time of the PEIR, the potential for adverse noise impacts cannot be quantified at this stage.
- 5.8.9 Following the PEIR, the noise and vibration assessment will be refined and developed and reported within the ES. This will involve continued consultation with local planning authorities. Baseline noise surveys would be undertaken to determine existing noise levels at sensitive receptors around above ground installations, along with updated assessments for construction noise and vibration, construction traffic noise, and operational noise. The English Onshore Scheme will be reviewed following stakeholder consultation feedback and further design refinement implemented, considered and assessed in the ES. Further environmental measures will be identified and implemented as necessary to ensure noise does not present a potentially significant adverse effect.

5.9 Air Quality

- 5.9.1 A desk study has been undertaken to inform the Air Quality preliminary assessment, using publicly available information. During operation of the Projects, the number of vehicles for maintenance works is unlikely to impact traffic flows along the road network. Therefore a detailed assessment of air pollutant emissions from traffic during the operation of the English Onshore Scheme has not been undertaken.
- 5.9.2 The risks from construction dust associated with the English Onshore Scheme has been determined as high, without taking into account measures to manage dust. To reduce risks from dust impacts a series of standard environmental measures outlined in guidance by the Institute of Air Quality Management would be implemented as part of the English Onshore Scheme. With these measures in place, the effects from construction dust would be considered not significant.
- 5.9.3 Preliminary traffic data was used to determine the roads and associated study areas which could be affected by emissions from construction traffic so that the effects on people from changes in air quality could be assessed. This identified that there is the potential for emissions from construction traffic from the English Onshore Scheme to impact on people present along the A16 John Adams Way in eastern and central Boston, the A52 Sleaford Road in Western Boston and on roads around the draft Order Limits in the Walpole area (Lynn Road and A47). Detailed dispersion modelling to assess potential impacts on people will be undertaken as part of the ES once detailed traffic data is available.
- 5.9.4 Preliminary traffic data was also used to determine the roads and associated study areas which could be affected by emissions from construction traffic so that effects on ecological receptors, such as plant species, could be assessed. This identified three roads where the potential for such effects could occur. These are Lynn Road, and two sections of the A47 between Lynn Road and Elm High Road (south of Wisbech). There are no nationally or internationally important ecological sites (known as Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) or Special Areas of Conservation (SACs)) within 200 m of these roads. Therefore, based on the provisional traffic data received at PEIR stage, it would appear that temporary changes in air pollutant concentrations associated with construction traffic from the English Onshore Scheme are unlikely to adversely affect statutory ecologically designated sites.
- 5.9.5 The air quality study area is shown on **Volume 3, Part 2: Figure 14.1 The Construction Assessment Study Area and on Figure 14.2 Construction Dust Assessment Study Area** of the PEIR.
- 5.9.6 Limit Values for air quality have been established for specific air quality pollutants. Department for Environment, Food and Rural Affairs' Pollution Climate Mapping provides mapping of pollutant concentrations. A comparison of this mapping against the roads potentially affected by construction traffic has shown that there is no risk of the emissions from construction traffic resulting in the Limit Values not being complied with.
- 5.9.7 Construction machinery, known as Non-Road Mobile Machinery (NRMM), would be active during the construction phase of the English Onshore Scheme at the construction compounds, Walpole converter stations and Walpole B Substation locations and could produce air pollutant emissions. Once the Projects are operational there would be emergency diesel back-up generators to power equipment if needed at the Walpole converter stations and Walpole B Substation. Within 200 m of these indicative locations, there are a number of sensitive receptors, consisting mostly of people present at residential properties and farms, the closest of which would be those located on Low

Lane (Ingleborough). There are no ecological sites located within 200 m of the indicative construction compounds, converter stations or Walpole B Substation locations. Air quality modelling of NRMM and emergency generators would be reviewed at the ES stage to assess whether emissions from construction machinery and emergency generators could have potentially significant effects on the people present around the English Onshore Scheme.

5.10 Socio-economics, Recreations and Tourism

- 5.10.1 A desk study has been undertaken to inform the preliminary assessment of Socio-economics, Recreation and Tourism effects using publicly available information. No site surveys have been undertaken as part of the PEIR, and these are not considered to be required as part of the ES for this topic.
- 5.10.2 The study area for the assessment of Socio-economics, Recreation and Tourism varies according to receptor:
- For Socio-economics, the study area for employment generation comprises a 'local' (Lincolnshire County Council, Norfolk County Council, and Cambridgeshire County Council) and 'regional' (East Midlands and East of England) study area for construction employment generation, as this represents the principal labour market catchment area and the population that are most likely to travel to and benefit from employment opportunities associated with construction of the English Onshore Scheme. For private properties and housing, dwellings that lie within the draft Order Limits and a 500 m study area beyond the draft Order Limits have been used.
 - For Recreation, the study area for public access for walkers, cyclists and horse riders comprises those public rights of way that are located within the draft Order Limits and a 500 m study area beyond the draft Order Limits.
 - For Tourism, the study area considers tourist attractions and tourist accommodation within the draft Order Limits and a 5 km study area from the draft Order Limits, as this is the area within which attractions or accommodation providers are most likely to be affected by the English Onshore Scheme.
- 5.10.3 The socio-economics, recreation and tourism study area is shown in **Volume 3, Part 2 Figure 15-1 Socio-economics, Recreation and Tourism Study Areas** of the PEIR.
- 5.10.4 The baseline population trends within the study area identify that the proportion of working age residents, economically active residents, and availability of jobs is broadly in line with the regional and England averages. Across the five local authority districts which comprise the local study area, a significant proportion of employee jobs were in Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles sector, which is similar to the county proportions but slightly higher than the regional and England levels.
- 5.10.5 Overall, there are no statistically significant population trends which differ from the regional or England averages, despite some minor local variations. The Indices of Multiple Deprivation ranks East Lindsey 30th most deprived of the 317 local authority districts in England. Fenland ranks 51st, followed by Kings Lynn and West Norfolk at 79th, Boston at 85th, and South Holland the 144th. This suggests a moderate to high level of deprivation within the local study area, with all districts aside from South Holland falling within the 30% most deprived in England (with East Lindsey in the top 10%).
- 5.10.6 The draft Order Limits and associated 500 m study area encompass the boundaries of a number of rural settlements within the five local authority districts, although the

indicative cable route has been identified to avoid routeing in proximity to residential dwellings where practicable. There are no residential dwellings or land allocations which fall within the draft Order Limits; however, a considerable number of properties are situated within the 500 m study area. Whilst many of these are scattered dwellings or small groups of properties, there are certain settlements where larger numbers of dwellings lie within the study area. There are an estimated 1,750 dwellings within the study area in total.

- 5.10.7 The study area contains numerous Public Rights of Way (PRoW) and designated routes, some of which fall within the draft Order Limits. These PRoW are typical local routes, many of which provide essential, daily connections for people using these routes for recreation within their local area or accessing local services and facilities without using a vehicle. Some of these PRoW also connect to other PRoW to form a wider network, allowing users access across a local authority district or county. Whilst the majority of PRoW within the draft Order Limits and study area are 'local', there are also several routes of national importance – the King Charles III England Coast Path (a national trail, comprised of long-distance footpaths and bridleways in England and Wales) and one National Cycle Network (NCN Route 1) route. Further detail on the numbers of PRoW and their location from the draft Order Limits will be incorporated into the ES following the evolution and refinement of the English Onshore Scheme design.
- 5.10.8 Tourist attractions typically comprise facilities such as museums, zoos and farm parks, heritage assets, country parks, theme parks, and points of interest. For the purposes of this assessment, beaches and nature reserves have also been included within the scope for tourist attractions, given the high volume of tourist visits within the region, and the likelihood of these being visited by tourist visitors from outside of the region, as well as local residents. There are no tourist attractions which fall within the draft Order Limits, however, a number of attractions of varying types are situated within the 5 km study area. Whilst some of these are likely to be visited by local residents as well as tourists, many attractions (such as National Trust properties, Royal Society for the Protection of Birds and National Landscape designations, and beaches) are also likely to attract regional and national tourists.
- 5.10.9 Tourist accommodation typically comprises temporary, short term, accommodation. There are a number of hotels, guesthouses, campsites and holiday parks located within close proximity to the study area, most notably large caravan and camping pitches throughout the area, particularly closer to the coast. There are no tourist accommodation providers which fall within the draft Order Limits; however, a number of accommodation providers of varying types are situated within the 5 km study area.
- 5.10.10 Whilst there could be potential changes in future in relation to Socio-economics, Recreation and Tourism, it is considered that changes to the population and physical changes to the baseline environment over time are unlikely to change significantly should the English Onshore Scheme not proceed or be delayed. No demographic changes of significance are anticipated to arise in the period that the English Onshore Scheme is constructed and becomes operational.
- 5.10.11 A range of environmental measures would be implemented as part of the English Onshore Scheme. The preliminary assessment of Socio-economics, Recreation and Tourism effects assumes that all environmental measures are in place before assessing the effects.

Construction

5.10.12 The following receptors, which have the potential to experience significant effects and have been taken forward for preliminary assessment within the PEIR, and detailed assessment in the ES are:

- Working age residents in the local and regional study area – potential for significant effects relating to construction employment generation (direct, indirect, and induced).
- Residents of private properties in the 500 m study area (there are no private properties within the draft Order Limits) – potential for significant effects relating to temporary disruption and delays to access, and amenity effects for residents.
- Walkers, cyclists, and horse riders using Public Rights of Way and other designated routes in the draft Order Limits and the 500 m study area – potential for significant effects relating to temporary disruption or diversions, and amenity effects for users.
- Visitors and users of tourist attractions in the 5 km study area – potential for significant effects relating to temporary disruption and delays to access, and amenity effects for visitors and users.
- Users of tourist accommodation in the 5 km study area – potential for significant effects relating to temporary disruption and delays to access and amenity effects for visitors, and temporary reduction in the availability of tourist accommodation for visitors.

5.10.13 At this stage, due to limited information either preliminary assessments have been made, or no assessment has been made. The ES will provide an assessment of the significance of these effects once the full assessment is carried out and more detailed information is available.

5.10.14 The preliminary assessment has concluded:

- There would be a minor beneficial (not significant) effect as a result of the number of jobs generated during construction. The ES chapter will provide a full assessment of the significance of the effects associated with employment generation taking account of the gross numbers of construction workers and the breakdown of net construction employee numbers per year.
- There is potential for significant adverse effects at a small number of tourist attractions, predominantly those which have an outdoor element or are solely outdoor-based tourist attractions. This effect will be revisited and assessed fully as part of the ES chapter.
- There is the potential for there to be significant effects during construction on residents of private properties, and walkers, cyclists, and horse riders using Public Rights of Way. The ES will provide an assessment of the significance of the effect once the full assessment is carried out.

5.10.15 No assessment has been undertaken to estimate the proportion of construction workers who would live in the local or regional area and commute or who are likely to live outside of the local and regional area and require access to temporary tourist accommodation. This information is currently being reviewed by the Applicant, with further analysis to follow in the ES.

5.11 Health and Wellbeing

- 5.11.1 A desk study has been undertaken to inform the preliminary assessment of health and wellbeing
- 5.11.2 The study area for the assessment of health and wellbeing comprises the draft Order Limits, as well as the local authority areas in which the English Onshore Scheme is located and has been defined using professional judgement and experience of similar linear projects. Where the assessment of health-related environmental change relies on data from other topic chapters, the study area for that chapter will be referred to in the assessment. The health and well-being study area is shown in **Volume 3, Part 2: Figure 16-1 Health and Wellbeing Study Area** of the PEIR.
- 5.11.3 Health and wellbeing statistics show a wide range of socioeconomic and health factors affecting different authorities across the study area. The study area presents local authority areas with varying proportions of ages, which represent different challenges in terms of healthcare, education and recreational provision. With the whole of the study area experiencing some level of fuel poverty and varying levels of income deprivation, opportunities for improving income parity are explored within the Local Plan documents and Health and Wellbeing Strategies. Similarly, these local policy documents explore the potential expansion of community services to support the population in more deprived areas. The health and wellbeing receptors are shown in **Volume 3, Part 2: Figure 16-2 Health and Wellbeing Receptors** the PEIR.
- 5.11.4 The future baseline is not expected to materially change within the lifecycle of the Projects.
- 5.11.5 Following the 2008 financial crisis, public spending cuts have reduced access to healthcare across England. The Covid-19 pandemic and subsequent cost of living crisis has further impacted people's lives by reducing access to recreational spaces and opportunities for adequate income. The pandemic has additionally increased the number of people living with limiting illnesses or disabilities, and while these impacts have been witnessed nationwide, the study area is no exception.
- 5.11.6 A number of policies and strategies are in place across the study area, aiming to address health and wellbeing inequalities, ensure the provision of health services and access to outdoor recreational facilities and improve the mental health and resilience of the population.
- 5.11.7 A range of environmental measures would be implemented as part of the English Onshore Scheme. The preliminary assessment of health and wellbeing effects assumes that all environmental measures are in place before assessing the effects.
- 5.11.8 Potential effects to the physical and mental health of the general population and vulnerable populations have been considered in the assessment. Physical and mental health can be affected by changes within the local environment resulting from the Projects, by changes to access to health, educational or recreational facilities (including Public Rights of Way), or by the potential mental health impacts from stress associated with the construction and operation of the Projects. Vulnerable populations are considered to be groups that may be more sensitive to changes from the Projects due to factors such as age, race or ethnicity, socioeconomic position, disability and health status, sex, or gender.
- 5.11.9 The physical and mental health of local populations (including vulnerable people) could be impacted if, as result of the construction of the Projects, there are impacts on local

services and access to these services. The preliminary assessment has found effects are unlikely to be significant throughout construction and operation of the Projects, as the Projects have been carefully designed and located to avoid the loss of any educational, health or employment facilities. Access to these facilities could be slowed as a result of an increase in construction traffic, however traffic management measures would be put in place to ensure that access around the Projects was maintained, and effects would be temporary.

- 5.11.10 The physical health of local populations can be affected by a number of impacts resulting from adverse effects from poor construction management, including construction dust, noise, pollution and contamination events, as described within other technical discipline chapters. The preliminary assessment found that these would all be managed in line with accepted guidance, and therefore there would be no significant effects on human health. This will be reviewed during the production of the Environmental Statement, as detailed construction noise and dust assessments are not yet available.
- 5.11.11 Adverse mental health effects could occur as a result of experiencing change of the local environment. This includes effects from changes in the landscape and to people's views, changes to water quality and flood risk, increased traffic flows and changes in noise levels and air quality as this may alter the amenity and character of the neighbourhood. The preliminary assessment has concluded that given the temporary nature of the construction works and measures to manage and control such effects, that overall effects on the general population and vulnerable groups are unlikely to be significant. However, this will be kept under review as part of the next steps of the Projects as a full assessment of some of the environmental effects is not yet available. Further assessment will be undertaken at this next stage of the Project, once more detailed information construction programming is available, to identify if these effects could result in changes in local neighbourhoods which may impact the mental health of the general and vulnerable populations.
- 5.11.12 The assessment has also looked at how health and wellbeing could be impacted as a result of the Projects' impacts on the Public Rights of Way (PRoW) network and potential impacts on people using the network for recreation. At this stage of the Projects, detailed information on how the PRoW network could be impacted is not yet available. As outlined in **Section 5.7** a number of measures will be put in place to minimise the impacts to people using PRoWs, including an outline Public Rights of Way Management Plan. Wherever possible, PRoWs will be kept open and measures such as temporary or permanent diversions put in place to ensure people can still use the network of PRoWs around the Projects throughout the construction and operational phases of the Projects.
- 5.11.13 Concerns about the potential health effects are often raised when new electricity infrastructure is proposed in an area. The UK has a carefully thought-out set of policies for protecting us all against Electric and Magnetic Fields (EMFs), the main component of which is exposure guidelines. Those exposure guidelines are set by independent scientific bodies and are based on decades-long studies into the effects of EMFs and ill health. After those decades of research, the weight of evidence is against there being any health risks of EMFs below the guideline limits. These policies are incorporated into the decision-making process for Development Consent for projects such as EGL 3 and EGL 4 in National Policy Statement (NPS) EN-5. These policies and guidelines are set to ensure all are protected against the effects of EMF. All the equipment which forms part of the Projects will be fully compliant with these policies. This will be fully and publicly documented in the DCO submission.

5.11.14 It is recognised that concerns about EMFs may adversely impact some people's mental health by heightened anxiety. National Grid provide open and transparent information about EMFs on the website www.emfs.info for members of the public to access, including what EMFs are, exposures from electricity infrastructure, research into health effects and the policies and guidelines in place to protect against EMF. An EMF helpline is also available to answer any questions or concerns about the subject and EMF specialists will be present at public consultation events, to address concerns and provide further information on EMFs and the measures in place to protect people, helping to reduce anxiety.

6. Preliminary Environmental Assessment-English Offshore Scheme

6.1 Designated Sites

- 6.1.1 In addition to the EIA other environmental assessments have been completed to fulfil the requirements of legislation including the Conservation of Habitats and Species Regulations (2017) (as amended) and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (for plans and projects beyond UK territorial waters (12 nautical miles)) (hereafter collectively referred to as the 'Habitats Regulations') and Marine and Coastal Access Act (2009) with respect to likely significant effects on internationally important nature conservation sites, known as European sites (i.e., Special Areas of Conservation, Special Protection Areas and Ramsar sites) and Marine Conservation Zones. Further information on these assessments can be found in **Volume 1, Part 3, Chapter 17: Designated sites.**

6.2 Coastal and Marine Physical Processes

- 6.2.1 The coastal and marine physical processes assessment is based on a range of publicly available and modelled data, incorporating site specific survey data. The assessment focusses on
- Hydrodynamics, including water levels, currents, waves and winds;
 - Geomorphology including coastal erosion, bathymetry, geology, surficial sediments and seabed features; and
 - Sediment transport, including suspended sediments.
- 6.2.2 The study area for marine physical processes includes the draft Order Limits plus an additional 15 km on either side. This buffer takes account of the tidal excursion (the average distance travelled by tidal flow between low-water slack tide and high-water slack tide), which varies within the draft Order Limits for the English Offshore Scheme. Regional scale modelling tools indicate that the largest tidal excursions occur at the landfall where they are 10 km on a mean tide (equivalent to around 14 km on a spring tide), with occasional local variation. In other areas within the draft Order Limits, tidal excursions are much shorter, being around 5 km on a mean tide. The adoption of a 15 km buffer throughout provides a precautionary approach.
- 6.2.3 Water depths across the study area generally increase with distance from the landfall, reaching 30 m at approximately Kilometre Point (KP) 44, 60 m at approximately KP 180 and maximums of 105 m towards the English – Scottish border at the northern end of the draft Order Limits. Water levels in the study area are predominantly driven by tidal processes. Tides in the study area are semi-diurnal, with two high and two low tides per day and generally orientated southwards on the flood tide (low to high tide) and northwards on the ebb tide (high to low tide). The fastest currents occur offshore of Spurn Head where peak spring tide current speeds are up to approximately 1.4 m/s.
- 6.2.4 The bedrock geology across the study area is characterised by chalk at the southern end of the English Offshore Scheme, mudstone and limestone to the north of

Flamborough Head and undifferentiated Triassic rocks (mix of rock, siliciclastic, argillaceous and sandstone) at the northern extent.

- 6.2.5 Net sediment transport in the study area is southwards close to shore, driven by the tidal asymmetry (with residual tidal flows to the south). Further offshore, there is a bed-load parting zone (the boundary between sediment transport pathways), beyond which the net sediment transport is northwards.
- 6.2.6 The coastline is generally made up of soft geology (predominantly gravelly sand and gravelly muddy sand). The beaches between Saltfleetby and Gibraltar Point (including the landfall) are formed of a thin layer of sand, overlying clay. Historically, during storms, the thin layer of sand has been eroded, exposing the underlying clay. To counter this erosion, the Environment Agency undertakes beach nourishment (a method of coastal management where sand, gravel, or other sediments are added to a beach).
- 6.2.7 The English Offshore Scheme passes through the Water Framework Directive (WFD) Lincolnshire water body, which is classed as a moderately exposed macrotidal water body (Water body ID GB640402492000). There are designated bathing waters (BW) at Mablethorpe Town, Moggs Eye and Anderby. All three have achieved 'Excellent' status for 2022, having maintained this classification for the last four bathing seasons (based on samples taken from 2018 through to 2022).
- 6.2.8 Several management plans will be provided as Outline Management Plans with the DCO application to support the Deemed Marine Licences. These will include an Outline Construction Environmental Management Plan (CEMP) and Outline Marine Pollution Contingency Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) and best industry practice during all phases of the English Offshore Scheme. Additionally, cable protection will be minimised as far as possible, with burial the preferred method of cable protection. Environmental measures will be secured through the DCO.
- 6.2.9 Marine physical processes are best described as pathways, rather than as receptors. Whilst outputs from the preliminary assessment are reported in the PEIR chapter (**Volume 1, Part 3, Chapter 18 Coastal and Marine Physical Processes**), for the most part, it is not practical for the outputs to be accompanied by statements of significance of effect. Instead, the information has been used to inform other ecological topic assessments.
- 6.2.10 The preliminary assessment of effects considered impacts associated with disturbance of sub-tidal seabed morphology, temporary increase in and deposition of suspended sediments, modifications to tidal and wave regimes and associated impacts to morphological features, and release of contaminated sediments.
- 6.2.11 With respect to disturbance to seabed morphology, there are areas within the draft Order Limits where it has been identified that some form of additional clearance, such as pre-sweeping or boulder clearance, or the use of remedial cable protection may be necessary when installing the cable. In these locations, the seabed would be disturbed, and where cable protection is used, changed to a different substrate (material on the seabed). Changes to seabed features, such as sand waves and boulder positions, are anticipated to be not significant. The changes would be localised in comparison to the features' extent in the North Sea. Where cable protection is introduced, the underlying substrate is not changed, but there would be direct effects on the associated habitats and species. This is considered in the intertidal and subtidal benthic ecology assessment.

- 6.2.12 Activities during all phases that disturb the seabed will cause localised sediment plumes (where finer sediments become suspended in the water). A decrease in how clear the water is, can have various effects on species in all levels of the food chain. Once the sediment settles out of suspension and onto the seabed, it can smother benthic habitats and species. Levels of sediment deposits will be highest immediately next to the cable trenches, decreasing with distance. The marine physical process assessment establishes the zone of influence for this impact pathway, which is used in the ecological assessments to determine the significance of effects.
- 6.2.13 During construction and operation, external cable protection would be deposited on the seabed. No potentially significant effects from this on tidal and wave regimes are likely due to the water depth in which cable protection is placed, and the localised footprints of the cable protection. The preliminary assessment concluded that the cable protection would not significantly alter sediment transport pathways.
- 6.2.14 Review of the metal concentrations in sediment samples across the draft Order Limits, concluded that with the exception of arsenic at several locations, all levels are below Cefas Action Level 1 threshold values. The elevated arsenic levels in offshore locations, were below the Cefas Action Level 2 thresholds. Arsenic is a natural component of seawater and rocks, and it is expected that the values are of natural origin rather than from human activity. It is anticipated that there will be no significant effects from the disturbance of sediments.

6.3 Intertidal and Subtidal Benthic Ecology

- 6.3.1 The intertidal and subtidal benthic ecology assessment considers the potential impacts on organisms living within or on the seabed (benthic organisms) and their supporting habitats. Shellfish species are covered under the Fish and Shellfish Ecology assessment. Potential effects on benthic ecology are assessed for all project phases: construction, operation, maintenance, and decommissioning.
- 6.3.2 The study area for intertidal and subtidal benthic ecology includes the draft Order Limits up to Mean High Water Springs, plus an additional 15 km buffer on either side. This represents a precautionary maximum zone of influence and has been selected to take into account the distance over which impacts from underwater noise and increased suspended sediment concentrations from the English Offshore Scheme could occur. The zone of influence has been influenced by the conclusions of **Volume 1, Part 3, Chapter 18 Coastal and Marine Physical Processes**, which readers should refer to for further information.
- 6.3.3 The installation of the cables at the Anderby Creek Landfall within the English Offshore Scheme would use a method that does not require excavation of trenches for the cable to be laid within (known as a trenchless technique) such as Horizontal Directional Drilling. Use of such measures would avoid disturbance and intrusive works in the intertidal area. The exit point for the Horizontal Directional Drilling, where the cables would transfer from the drilled cable ducts under the seabed to seabed burial, would be entirely in the subtidal environment. There would be no direct impacts to intertidal benthic ecology receptors, except in the event of drilling fluid being released (known as frac-outs), where clean-up activities may be required, however, this is only likely in exceptional circumstances.
- 6.3.4 Part of the English Onshore Scheme crosses the River Welland and River Nene, tidal rivers, using a trenchless technique. As the cables would pass under the riverbed below

Mean High Water Springs, there is no impact pathway for physical disturbance or habitat loss. This activity would not require a marine licence.

- 6.3.5 Habitat types identified within the draft Order Limits are typical of the wider North Sea and are dominated by coarse and mixed sediment, with the presence of cobbles and boulders. Priority habitats have been identified within the draft Order Limits, these include subtidal sands and gravel, stony reef and piddocks. The assessment concluded that whilst Ross worm (*Sabellaria spinulosa*) is present, it does not form a reef.
- 6.3.6 Several management plans will be provided with the ES to support the Deemed Marine Licences. These will include an Outline Construction Environmental Management Plan (CEMP) and Outline Marine Pollution Contingency Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) during all phases of the English Offshore Scheme. A number of measures which form part of the design, which will also be secured through the DCO will further reduce environmental impact. These include burying cables, installing the cables using trenchless methods at the landfall and using only the minimum amount of rock/cable protection necessary.
- 6.3.7 The preliminary assessment of effects identifies several potential effects on intertidal and subtidal benthic ecology across different project phases, including temporary and permanent habitat loss, temporary increase in suspended sediments, underwater noise disturbance, introduction of marine invasive non-native species and electromagnetic and thermal (heat) changes.
- 6.3.8 Construction activities such as identification of unexploded ordnance, sandwave pre-sweeping and cable trenching, cable repairs, and ultimately decommissioning would temporarily disturb seabed habitats and could result in temporary habitat loss. Sensitivity to the impact of loss varies between habitats and species. For all species and habitats, however, there are no anticipated significant impacts due to the low sensitivity of the species and habitats present and their ability to recover from the temporary loss and disturbance.
- 6.3.9 During construction and operation, habitat would be permanently lost due to the deposit of external cable protection, which comprises the introduction of a hard substrate replacing other natural substrates. The footprint of this impact is minor in comparison to the wider habitats of the North Sea. The loss of any habitat would, therefore, be limited, and the impact is not anticipated to be significant.
- 6.3.10 Activities during all phases that disturb the seabed will cause localised sediment plumes. Once the sediment settles out of suspension, it can smother benthic habitats and species. Sensitivity to the impact varies between habitats and species. For all species and habitats however, there are no anticipated significant impacts due to the low sensitivity of the species and habitats present and the low magnitude of the impact.
- 6.3.11 All works undertaken during the construction, operation and decommissioning of the English Offshore Scheme will generate underwater sound. Sound is readily transmitted into the underwater environment. These effects are temporary in nature and considered not significant for benthic species.
- 6.3.12 Introduction of marine invasive non-native species could occur as a result of the presence of the Projects vessels and deployment of equipment and external cable protection. Due to the low sensitivity of the habitats and species to marine invasive non-native species and the requirements of vessels to undertake a biosecurity risk assessment prior to arriving on site, significant impacts are not anticipated.

- 6.3.13 Electromagnetic changes could occur during the operational phase as a direct result of the electricity passing through the cables. There is little evidence to suggest that benthic marine invertebrates are sensitive to electromagnetic fields. As cables will be buried or protected, the effect of electromagnetic fields on benthic organisms is not considered significant.
- 6.3.14 Localised heating of the surrounding environment (i.e., sediment for buried cables or water in the spaces within the external cable protection) would be caused due to cable heat losses because of the resistance in the cable/conductor. A change in sediment temperature has the potential to cause sediment dwelling and demersal mobile organisms (species that live close to the seabed) to move away from the affected area. Whilst temperature may be elevated in the immediate area around the cables, it rapidly decreases with increasing distance away from the cables. Due to the minor increase in temperature significant impacts are not anticipated.

6.4 Fish and Shellfish

- 6.4.1 The assessment of effects on fish and shellfish includes marine species, diadromous species (species which migrate between freshwater and marine environments), elasmobranchs (sharks, rays and skates), and shellfish (crustaceans and molluscs). The preliminary assessment is based on information obtained to date.
- 6.4.2 Part of the English Onshore Scheme crosses the River Welland and River Nene, tidal rivers. At these locations, cables will be installed using a trenchless technique. As the cables would pass under the riverbed below Mean High Water Springs, physical disturbance or habitat loss would not occur. **Volume 1, Part 2, Chapter 6: Biodiversity** provides a preliminary assessment of the impacts of electromagnetic changes on the riverine fish.
- 6.4.3 The study area for Fish and Shellfish includes the draft Order Limits up to Mean High Water Springs, plus an additional 15 km buffer on either side. This represents a precautionary maximum zone of influence selected to take account of the distance over which impacts from underwater noise and increased suspended sediment concentrations from the English Offshore Scheme could occur. It is based on the conclusions of the **Coastal and Marine Physical Processes** assessment, (**Volume 1, Part 3, Chapter 18: Coastal and Marine Physical Processes**), and this should be read in conjunction with these findings.
- 6.4.4 Several management plans will be provided as Outline Management Plans with the DCO application to support the Deemed Marine Licences. These will include an Outline Construction Environmental Management Plan (CEMP) and Outline Marine Pollution Contingency Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) during all phases of the English Offshore Scheme. A number of environmental measures, which will also be secured through the DCO will further reduce environmental impact, such as burying of cables, installing the cable at the landfall using trenchless construction techniques, using only the minimum amount of rock/cable protection necessary and where appropriate, matching cable protection to the surrounding habitat.
- 6.4.5 The preliminary assessment of effects identifies several potential impacts on Fish and Shellfish across different project phases, including temporary and permanent habitat loss, temporary increase in suspended sediments, underwater noise disturbance and electromagnetic and thermal (heat) changes.

- 6.4.6 With respect to temporary habitat loss and seabed disturbance, construction activities such as identification of unexploded ordnance, sandwave pre-sweeping and installing cables in trenches, cable repairs, and ultimately decommissioning may temporarily disturb seabed habitats. Sensitivity to the impact of seabed disturbance and temporary habitat loss varies between species, with particular focus paid by the assessment to herring, sandeel and shellfish. For all species and habitats, however, there are no anticipated significant impacts due to the temporary and highly localised nature of the disturbance.
- 6.4.7 During construction and operation, habitat would be permanently lost due to the deposit of external cable protection; introduction of a hard substrate replacing other natural substrates. The footprint of this impact is minor in comparison to the wider habitats of the North Sea. The loss of any habitat would therefore be limited, and the impact is anticipated to be not significant.
- 6.4.8 Activities during all phases that disturb the seabed will cause localised sediment plumes. There are several types of impact that could occur from suspended sediment. The types of impacts assessed comprised a reduction in visibility, which could reduce feeding success, sediment clogging the feeding apparatus of fish and shellfish species and smothering of species and habitats as sediment settles back on to the seabed. Sensitivity to the impact varies between species. For all species however, there are no anticipated significant impacts due to the small spatial scale over which these effects are anticipated.
- 6.4.9 All works undertaken during the construction, operation and decommissioning of the English Offshore Scheme will generate underwater sound. Sound is readily transmitted into the underwater environment. Sound can be categorised into impulsive sources or continuous sources. Fish hearing sensitivity to noise varies across species, largely depending on the presence of a swim bladder. The proposed construction activities (excluding unexploded ordnance clearance) are not associated with sound levels that are likely to cause injury or disturbance and are therefore not considered significant. Unexploded ordnance clearance is not included within the DCO and will be considered in a separate Marine Licence with appropriate mitigation to reduce any potentially significant impacts.
- 6.4.10 Electromagnetic changes could occur during the operational phase as a direct result of the electricity passing through the cables. Sensitivity to electromagnetic fields is species-dependent and largely limited to those species present on the seabed. As cables will be bundled and buried or protected, the effect of electromagnetic changes will be highly localised and therefore impacts to fish species including barriers to diadromous fish are not considered significant.
- 6.4.11 Localised heating of the surrounding environment (i.e., sediment for buried cables, or water in the spaces within the external cable protection) would be caused due to cable heat losses because of the resistance in the cable/conductor. Species that could be particularly affected by this impact are species that bury themselves in the top layer of sediment e.g., such as shellfish like cockles, Nephrops, and crab. Whilst temperatures may be elevated in the immediate vicinity of the cables it rapidly decreases with increasing distance and due to the minor increase in temperature significant impacts are not anticipated.

6.5 Intertidal and Offshore Ornithology

- 6.5.1 The potential impacts on a range of marine birds (referred to as intertidal and offshore ornithology) using a defined study area around the English Offshore Scheme have been assessed. The analysis considers the construction, operation and decommissioning phases of the English Offshore Scheme, using publicly available data, survey data acquired at the landfall and stakeholder consultations.
- 6.5.2 The study area used in the intertidal and offshore ornithology assessment was defined taking account of the likely Zone of Influence over which the English Offshore Schemes could have potentially significant effects. Consideration was also given to the need to gather sufficient data to account for worst case scenarios for the impact assessment. It takes into consideration:
- Seabird foraging ranges.
 - Recent recommendations from statutory nature conservation bodies regarding maximum disturbance/displacement ranges for sensitive bird species.
 - Maximum tidal excursion to encompass the potential impact pathway from increased sediment concentrations, which could affect a bird's ability to seek prey.
- 6.5.3 The defined Zone of Influence is specific to the bird species or groups of bird species; this can be for functional groups or individual species where relevant and may change depending on the stage the English Offshore Scheme is at. For example, a Zone of Influence may be larger during construction for a certain bird species than it is during operation. The Zone of Influence can also vary depending on the individual sensitivities of different bird species within the same ornithological group. In this case, the largest Zone of Influence for that functional group has been considered by the preliminary assessment.
- 6.5.4 The study area for intertidal and offshore ornithology includes the draft Order Limits up to Mean High Water Springs plus an additional 15 km buffer either side. This represents a precautionary maximum Zone of Influence selected to take account of the distance over which impacts from increased suspended sediment concentrations from the English Offshore Scheme could occur. It is based on the conclusions of the **Coastal and Marine Physical Processes** assessment (see **Volume 1, Part 3: Chapter 18: Coastal and Marine Physical Processes**). Advice from statutory nature conservation bodies is that a maximum buffer of 10 km should be applied to consider disturbance effects on red-throated diver and a buffer of at least 4 km should be applied for other diving birds (MIG-Birds, 2022). The 15 km buffer used to define the study area is therefore large enough to cover the potential effects of displacement as well as potential effects resulting from increases in turbidity (the cloudiness or haziness of the water caused by large numbers of individual particles).
- 6.5.5 Fifteen species of waders and eighteen species of seaducks, swans and geese have been identified as using the fields adjacent to the landfall. The landfall and approximately 36 km of the English Offshore Scheme out to sea from the landfall are within the Greater Wash Special Protection Area, an internationally important nature conservation site, which is important for over wintering red throated diver, common scoter and little gull; and breeding common tern, little tern and Sandwich tern. Further offshore, the English Offshore Scheme lies within a shallow area of low salinity which is important for a number of bird species, in particular divers, gulls, seaduck and terns.

- 6.5.6 Several management plans will be provided as Outline Management Plans with the DCO application to support the Deemed Marine Licences. These will include an Outline Construction Environmental Management Plan (CEMP) and an Outline Marine Pollution Contingency Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) and best industry practice during all phases of the English Offshore Scheme.
- 6.5.7 The preliminary assessment of effects considered impacts due to temporary increase and deposition of suspended sediments, changes in distribution of prey species during construction and operation, and visual and physical disturbance or displacement during all phases. Assessments were provided for species function groups and also the Greater Wash Special Protection Area.
- 6.5.8 In terms of temporary increase and deposition of suspended sediments, features of the Greater Wash Special Protection Area are considered sensitive to changes in suspended sediment concentrations. The baseline assessment indicates that the gull and tern receptors already prefer alternative foraging areas within the Special Protection Area and their use of sea within the draft Order Limits is marginal. Similarly, the red throated diver and common scoter are also thought to be sensitive to temporary changes in suspended sediment concentrations, but their preferred foraging areas do not overlap the draft Order Limits. Therefore, impacts to features of the Greater Wash Special Protection Area are not considered significant. For all species outside of the Greater Wash Special Protection Area, including divers, grebes, mergansers, terns, gulls, kittiwakes, gannets and auks, there is little overlap of the draft Order Limits with preferred foraging areas, and given the availability of alternative areas, no significant impacts are anticipated.
- 6.5.9 The distribution of prey could change as a result of loss of habitat from laying cable protection. Effects from this type of change were assessed for species within the and outside the Greater Wash Special Protection Area, where the red throated diver feature is considered the most sensitive species. The works within the Special Protection Area are not likely to result in a significant loss of habitat for prey species and therefore, no significant impact is anticipated. With respect to all other species, the **Fish and Shellfish (see Volume 1, Part 3, Chapter 20: Fish and Shellfish Ecology)** assessment concludes that there will be no adverse effect on fish (as prey) and therefore there will be no discernible effect on seabirds. The same conclusions can be drawn for the operation phase due to the limited overlap with the supporting habitat.
- 6.5.10 With respect to effects from visual and physical disturbance, for example from the presence of construction activity and vessels, it is noted that individual species will react differently. Within the Greater Wash Special Protection Area, all species are considered sensitive to disturbance by vessels during construction and decommissioning, however, whilst there may be temporary disturbance, given the presence of prime grounds and preferred foraging areas outside of the study area, impacts are not anticipated to be significant. The same conclusion can be drawn for all species outside of the Special Protection Area. During the operational phase, the same conclusions can be drawn for periods of maintenance.
- 6.5.11 For all impacts considered, the preliminary assessment concludes that, with environmental measures in place, the English Offshore Scheme is not expected to result in significant adverse effects on intertidal and offshore ornithology.

6.6 Marine Mammals

- 6.6.1 The marine mammal's assessment evaluates the potential impacts on cetaceans (whales, dolphins, porpoises), pinnipeds (seals), and the European otter. The analysis considers the construction, operation, maintenance, and decommissioning phases of the English Offshore Scheme, using publicly available data, marine mammal sightings data recorded during the English Offshore Scheme geophysical survey and stakeholder consultations.
- 6.6.2 Given the highly mobile and transient behaviour of marine mammals, the study area for these species has been identified according to their mobility and geographic range. Separate areas for each cetacean species have been defined using Management Units (MUs). These are identified by the Inter-Agency Marine Mammal Working Group (which comprises representatives from the UK Statutory Nature Conservation Bodies i.e., Natural England, NatureScot, Natural Resources Wales and the Department of Agriculture, Environment and Rural Affairs). The boundaries of an MU do not necessarily reflect the full range of a species but instead show areas within their territory where management of human activities is undertaken. Additionally, study areas have been defined for seal and otter based on their distribution and foraging ranges.
- 6.6.3 Seven species of cetacean are encountered in the study area, with other species rare visitors. Species identified as commonly present within the study area include harbour porpoise, white-beaked dolphin, minke whale, bottlenose dolphin, and short-beaked common dolphin, with occasional sightings of humpback whale and fin whale also recorded. Two species of pinniped are resident in UK waters: grey seal (and common or harbour seal, and both are present in the study area. European otter, although largely terrestrial (i.e., onshore or inland) can inhabit coastal areas and are known to forage in a narrow zone close to shore (<80 m), but sightings around the landfall are rare.
- 6.6.4 The study area incorporates a number of sites designated for the protection of marine mammals, and due to the transient nature of marine mammals, includes designated sites in Scotland and in European waters. Designated sites considered relevant in the UK are the Southern North Sea Special Area of Conservation (SAC) (which the English Offshore Scheme crosses), The Humber Estuary SAC, The Wash and North Norfolk SAC, Berwickshire and North Northumberland Coast SAC, Southern Trench Nature Conservation Marine Protected Area (NCMPA), Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR), and in Europe are the Klaverbank SAC/SCI (Site of Community Importance), Dogger Bank SAC/SCI, Vlamme Banken SAC, Doggerbank SAC and Bancs des Flandres SAC.
- 6.6.5 Several management plans will be provided as Outline Management Plans with the DCO application to support the Deemed Marine Licences. These will include an Outline CEMP, Outline Marine Pollution Contingency Plan, and Outline Marine Mammal Mitigation Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) and best industry practice e.g., implementation of Joint Nature Conservation Committee (JNCC) guidance to reduce impacts on marine mammals from underwater noise during geophysical surveys, during all phases of the English Offshore Scheme.
- 6.6.6 The preliminary assessment of effects considered impacts due to temporary or permanent habitat loss, changes in prey availability, underwater sound and collision with English Offshore Scheme vessels for all phases of development as appropriate.
- 6.6.7 Activities associated with the English Offshore Scheme may result in temporary and permanent habitat loss, which in turn can affect the availability of prey species for

marine mammals. Prey species could also be impacted by changes in underwater sound, temporary increase and deposition of suspended sediments and sediment heat changes. These changes could combine with temporary and permanent habitat loss to lead to a change in prey availability. Given the limited footprint of the English Offshore Scheme within the overall area available to marine mammals to hunt and forage for food, no significant effects on marine mammals as a result of changes in prey availability are expected.

- 6.6.8 Cetaceans and pinnipeds have evolved to use sound as an important aid in navigation, communication and hunting. It is generally accepted that exposure at close range to high noise levels can cause permanent or temporary hearing damage, while in extreme circumstances and at a very close range, gross physical trauma is possible. At wider ranges, the introduction of any additional underwater sound could potentially cause short term behavioural changes. Sound is readily transmitted into the underwater environment, and there is potential for the sound generated during construction, operation, maintenance and decommissioning of the English Offshore Scheme to affect marine mammals. The preliminary environmental assessment therefore considers the potential for lethal/physical injury, auditory injury and behavioural disturbance for surveys, construction activities, operation and decommissioning. A high-level assessment has also been provided for impacts from unexploded ordnance clearance although at the request of the Marine Management Organisation, this would be licensed separately i.e., not through the Deemed Marine Licences.
- 6.6.9 For all impacts considered, the preliminary assessment concludes that, with environmental measures in place, the English Offshore Scheme is not expected to result in significant adverse effects on marine mammals.

6.7 Shipping and Navigation

- 6.7.1 The assessment of effects on Shipping and Navigation, including commercial and recreational vessel activity and navigational features, covers the installation, operational and decommissioning phases of the English Offshore Scheme. The assessment has been undertaken using purchased Automatic Identification System data and other relevant publicly available data and has been shaped through stakeholder consultation, which has informed the completion of the Navigational Risk Assessment which underpins the assessment.
- 6.7.2 The study area for the assessment consisted of the draft Order Limits, plus an additional five Nautical Mile (NM) buffer either side. This represents a precautionary maximum zone of influence that considers all shipping patterns and navigational features that may interact with any phase of the life cycle of the English Offshore Scheme. This buffer has been selected through previous project experience (and is therefore considered industry standard).
- 6.7.3 The assessment was conducted using a risk matrix approach as is considered industry standard (following recommendations for best practice from the Maritime and Coastguard Agency (MCA)), which was aligned with the significance assessment methodology used for the other assessments for the English Offshore Scheme.
- 6.7.4 Several potential effects were scoped in for further assessment, all of which had been consulted upon with relevant stakeholders:
- Increased risk of vessel collisions.
 - Disturbance to existing shipping and fishing patterns.

- Accidental anchor strike or drag onto exposed submarine cable.
- Accidental fishing gear snagging onto exposed submarine cable or cable protection measure.
- Reduction in under-keel clearance.
- Interference with marine navigational equipment during the operational phase.
- Project vessels blocking navigational features.

6.7.5 Multiple environmental measures can be applied to each phase of the English Offshore Scheme, such as (but not limited to):

- Giving notice of activities to other marine users through Notice to Mariners (weekly updates on safety critical information).
- Establishing effective channels of communication with relevant stakeholders.
- Applying exclusion zones around the vessel during operations.
- Identifying areas of unburied cable through suitable measures.
- Taking reasonable endeavours so that navigable depth is not reduced.

6.7.6 Following the assessment, two potential effects were assessed to have a moderate risk (considered potentially significant). These effects include disturbance to existing shipping and fishing activity, and the English Offshore Scheme vessels blocking navigational features. Additional information available through refined project design of the English Offshore Scheme and further feedback from relevant stakeholders will be considered in the ES in regard to these effects.

6.7.7 All other effects were considered to be of negligible or minor risk, which is assessed as not significant.

6.8 Commercial Fisheries

6.8.1 The assessment of effects on Commercial Fisheries from the English Offshore Scheme has included pelagic (species that live within the water column), demersal (species live and feed on or near the bottom of seas or lakes), and shellfish (crustaceans and molluscs).

6.8.2 The study area for commercial fisheries includes the draft Order Limits up to Mean High Water Springs, plus an additional 15 km buffer on either side. This represents a precautionary maximum zone of influence selected to take account of the distance over which impacts from underwater sound and increased suspended sediment concentrations from the English Offshore Scheme could occur. This is based upon the conclusions of the **Volume 1, Part 3, Chapter 18: Coastal and Marine Physical Processes** assessment.

6.8.3 The study area for commercial fisheries is also defined by the International Council for the Exploration of the Sea (ICES) rectangles in which the English Offshore Scheme lies. Each Rectangle is approximately 30 nautical miles (NM) wide and is 30 min latitude and 1° longitude in size and is used to record and collate statistical fisheries data (ICES, 2022). The study area lies within ICES Area IVc (Southern North Sea) IVb (Greater North Sea) and consists of the following nine ICES rectangles: 35F0, 36F0, 37F0, 38E9, 38F0, 39E9, 40E9, 40E8 and 41E9.

- 6.8.4 The study area is fished by UK and European fleets and sightings data records vessels from Belgium, Germany, Denmark, France, the Netherlands, Norway and Portugal. There are 21 ports within the study area, which have registered vessels who fish within the nine rectangles the draft Order Limits transect.
- 6.8.5 There are many different fishing methods used with the study area, including:
- Beam trawling
 - Demersal trawling
 - Seine nets
 - Pelagic trawl
 - Netting
 - Longlining
 - Handlines
 - Pots and traps
 - Scallop dredging
 - Hydraulic Suction dredging
- 6.8.6 A range of environmental measures would be implemented as part of the English Offshore Scheme, which include issuing Notice to Mariners (weekly updates with the latest safety critical navigational information) in advance of any works; advisory clearance distances around English Offshore Scheme vessels will be implemented in consultation with the fishing industry; and where possible, burial of the cables will be undertaken to avoid changes to substrate and creation of snagging risks.
- 6.8.7 The preliminary assessment of effects considered impacts due to temporary restricted access to fishing grounds, temporary displacement of fishing activity into other areas and temporary increase and deposition of suspended sediments.
- 6.8.8 During construction, fishing activity will be temporarily excluded from discrete areas of the draft Order Limits due to the implementation of advisory clearance areas around English Offshore Scheme vessels, which will move as the works progress. There would also be a requirement for fishing vessels that use static gear, such as pots to clear their gear from within the draft Order Limits, or a part of it, in advance of any works. Additionally, during the construction phase fishing vessels may be asked to avoid areas of the draft Order Limits where the installed cables may be temporarily vulnerable for example where cables are surface laid or exposed and are awaiting trenching or protection. For all gear types and phases of the English Offshore Schemes, no significant effects are anticipated.
- 6.8.9 Temporary displacement of commercial fish species from fishing grounds within the English Offshore Scheme may lead to temporary increases in fishing effort in other areas which may already be heavily fished. It may also increase the steaming distances of vessels to reach other fishing grounds. Due to the availability of other ground and the temporary nature of this impact, it is assessed as not significant for all gear types.
- 6.8.10 Temporary increases and depositions of suspended sediments are likely to occur from seabed clearance works, cable burial and cable removal. The Coastal and Marine Physical Processes assessment concluded that the temporary increases and depositions of suspended sediments will be minor. As such, any impact from SSC is expected to be small and highly localised. For all gear types and phases of the English Offshore Scheme, no significant effects are anticipated.
- 6.8.11 With respect to loss of fishing ground due to the deposit of external cable protection, most gear types will continue to fish over the buried cables. However bottom drift netting requires a flat featureless seabed to operate effectively. MMO catch data shows that the use of bottom drift netting in the area is at a low level. Due to the preliminary nature of the cable route design, it is not known if there will be any areas of external

cable protection within existing drift net grounds. This will be further assessed within the ES.

6.9 Other Marine Users

- 6.9.1 The assessment of effects on other marine users is based on a range of publicly available data. In this context other marine users includes offshore wind farms; other power and telecommunication cables; carbon capture and storage and natural gas storage sites; disposal sites; aggregate extraction sites; chemical weapon and munitions disposal sites; Ministry of Defence Practice Exercise Areas (; oil and gas operations; recreational activities (note that recreational boating is also covered in the **Volume 1, Part 3, Chapter 23: Shipping and Navigation** assessment); angling – including chartered anglers (note that commercial fishing is also covered in the **Volume 1, Part 3, Chapter 24: Commercial Fisheries** assessment); and recreational users such as recreational swimmers and scuba divers.
- 6.9.2 The study area for this receptor includes the draft Order Limits plus an additional 9.5 km (5 nautical miles) buffer to either side of the centreline within the draft Order Limits (19 km in total). The zone of impact on the seabed relates to the footprint of physical impact; as such, the study area is defined by how the English Offshore Scheme impacts other marine users.
- 6.9.3 A range of potential impacts on other marine users have been identified which may occur during the construction, operation, and decommissioning phases of the English Offshore Scheme.
- 6.9.4 Several management plans will be provided as Outline Management Plans with the DCO application to support the Deemed Marine Licences. These will include an Outline CEMP and Outline Marine Pollution Contingency Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) and best industry practice during all phases of the English Offshore Scheme. These management plans will also include details of notices to be sent to other marine users prior to activities being undertaken. Environmental measures will be secured through the DCO. In addition, industry guidance will be followed and implementation of commercial infrastructure crossing and proximity agreements will be sought with third parties as appropriate.
- 6.9.5 Several potential effects were identified and scoped in for further assessment, including interaction and damage to third party infrastructure such as active and out of service power cables, telecoms cables and active pipelines. As these are all considered to be of international importance, any impact to these would be potentially significant. However, it is common for any development in the marine environment to interact with other marine users, standard environmental measures will be implemented to reduce any impacts.
- 6.9.6 Interaction with recreational users, including bathers, divers, recreational sailing and anglers has been assessed in relation to changes affecting water quality and restriction of access to recreational areas. For all phases of the English Offshore Scheme the effects are short term and temporary in nature, therefore, impacts are not considered to be significant.
- 6.9.7 In terms of occupancy of the seabed both above and below the seabed, the minimum area of seabed required for the English Offshore Scheme is being secured. Projects

that seek to develop in the same area in the future would not be restricted from doing so, therefore, there is no significant effect.

6.10 Marine Archaeology

- 6.10.1 The assessment of the effects on marine archaeology evaluates the potential impacts to relevant receptors and works from the baseline determined by a detailed review of publicly available and site-specific data. Marine archaeology receptors generally fall within the following categories:
- Submerged prehistoric and palaeolandscape remains (i.e. landforms and geological units representing formally terrestrial (onshore) landscapes now submerged and archaeological remains related to human occupation of those landscapes);
 - Coastal and maritime remains; and
 - Aviation remains.
- 6.10.2 The study area for marine archaeology includes the draft Order Limits plus an additional 2 km measured from the draft Order Limits. Above Mean High Water Springs (MHWS), the study area extends to 200 m inland. Whilst all potential direct impacts to marine archaeology receptors would occur within the draft Order Limits, the study area accommodates for assessment of indirect impacts that may affect marine archaeology receptors beyond the draft Order Limits. Such impacts with the potential to result in potentially significant effects on marine archaeology receptors generally have a range of up to 1 km from the activity with the potential to cause the impact. Therefore, a 2 km study area has been used as a conservative approach. Furthermore, the study area permits a greater, but proportionate, quantity of data with which to inform the baseline for marine archaeology. This helps increase understanding of the potential presence and character of hitherto undiscovered remains within the draft Order Limits.
- 6.10.3 The baseline assessment identified the following records within the marine archaeology study area, derived from publicly available data:
- One hundred and seven (107) United Kingdom Hydrographic Office (UKHO) records, relating to wreck sites and seabed obstructions; and
 - Thirty-nine (39) National Record of the Historic Environment (NRHE), ten (10) Canmore, 11 Lincolnshire Historic Environment Record (HER) and 57 Coastal and Intertidal Zone Archaeological Network (CITiZAN) records, marking findspots and sites of archaeological interest.
- 6.10.4 Analysis of site-specific geophysical and geotechnical data, British Geological Survey (BGS) studies within the North Sea, and wider literature has provisionally identified 14 geological units within the study area. Eleven of these have the potential to contain palaeoenvironmental evidence, such as pollen and faunal remains, which may be used to reconstruct ancient landscapes and environments. Four of the 14 provisionally identified geological units have the potential to contain evidence of human activity. One further unit (potentially representing the Aberdeen Ground Formation) was not able to be assessed for archaeological or palaeoenvironmental potential, given the very limited understanding at the time of writing of the presence, extent and characteristics of this unit within the study area.
- 6.10.5 The baseline assessment included the archaeological assessment and interpretation of geophysical data acquired for the Projects by an experienced marine archaeological geophysicist. The principal aim of the assessment was to establish the presence of

material of potential anthropogenic (human) origin (anomalies) on, or below, the seabed. The anomalies were interpreted as to their potential to represent material of archaeological significance. The assessment of the data identified:

- Three (3) anomalies of high archaeological potential (likely wrecks);
- Twenty-three (23) medium potential anomalies (likely wreck-related material, such as debris);
- 1,277 low potential anomalies (likely manmade in origin but of limited archaeological interest, e.g. discarded fishing gear); and
- 14,928 magnetic anomalies (anomalies with a magnetic signature and likely manmade in origin).

6.10.6 In addition to the identified existing archaeological records and geophysical anomalies of archaeological potential, the baseline highlighted a general potential for hitherto unidentified archaeological remains and sites within the draft Order Limits.

6.10.7 The impact assessment for marine archaeology first identified potential receptors then examined the pathways for direct and indirect impacts. A suite of industry-standard environmental measures will be followed to mitigate the significance of effect for each potential impact.

6.10.8 The environmental measures are detailed in the appended Outline Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD), which will be adhered to throughout the construction and operational phases of the Projects. Direct impacts to known archaeological sites will be removed through implementation of Archaeological Exclusion Zones (AEZs), which will also reduce the significance of any potential indirect impacts. Potential impacts to sites and remains of uncertain origin and hitherto undiscovered archaeological remains will be mitigated through other environmental measures, including a protocol for reporting archaeological finds (PAD), archaeological input into future survey design and review of new data, and a staged process of geoarchaeological investigation.

6.10.9 The preliminary impact assessment, including consideration of environmental measures, concluded that no significant impacts would be experienced by marine archaeology receptors during the construction and operational phases of the Projects.

7. Project-Wide Effects

7.1 Greenhouse Gas

- 7.1.1 The assessment considers the effects on the climate of the greenhouse gas emissions arising from the operation and construction of the Projects, including how the Projects would affect the ability of the UK Government to meet its carbon reduction targets.
- 7.1.2 The in-combination climate change impact (ICCI) assessment, which considers the extent to which climate change exacerbates effects on receptors identified in the other aspect chapters, is described in each relevant chapter. For example, the assessment of effects on water and flood risk will take into account how future changes in the climate and rainfall could affect the likelihood of flooding.
- 7.1.3 The assessment will consider the likely significant effects of greenhouse gas emissions associated with the Projects on the Global Climate. However, at this stage of the design process, there is uncertainty as to the location and spatial extent of many key design elements associated with the Projects. In general terms, the key activities that will cause greenhouse gas emissions within the Projects relate to the quantities of materials used, the manufacture and transport of those materials to the sites and the construction of the Projects (associated plant equipment and resource use).
- 7.1.4 Consideration of the significance of the greenhouse gas emissions from the Projects is determined based on the criteria developed from guidance produced by The Institute of Environmental Management and Assessment (IEMA).
- 7.1.5 At ES stage, when a more developed design proposal is in place, a quantified assessment of significance will be undertaken. This will necessarily be a 'worst case' scenario since it will incorporate an estimated bill of quantities (i.e. an estimate of the quantity of specific materials to build and operate the Projects) and model primary activities as set out in an indicative schedule.
- 7.1.6 The UK Government's carbon budget (2023 to 2027) of 1,950 million tCO_{2e} (tonnes of Carbon Dioxide Equivalent) and the Climate Change Committee's (CCC's) recommended carbon budget power sector allocation (143 million tCO_{2e} at an average per year of 29 million tCO_{2e}) are considered as the current baseline for the greenhouse gas emissions assessment.
- 7.1.7 An Outline CoCP will be produced, which sets out measures to be implemented, such as goals to reduce embodied carbon in construction materials and therefore reduce greenhouse gas emissions and encouragement of circular economy principles during construction. The Outline CoCP will also include measures such as consolidating deliveries where possible and policies such as 'no idling'. These measures will seek to minimise the greenhouse gas emissions associated with construction traffic.
- 7.1.8 Leakage of sulphur hexafluoride (SF₆) used within switchgear equipment in substations is a potential source of greenhouse gas emissions during the operational lifetime of the Projects. National Grid has a Network Asset Risk Metric (NARM) framework in place. The NARM framework determines whether equipment intervention is required to reduce leakages.

- 7.1.9 The significance of greenhouse gas emissions associated with the Projects is evaluated based on the extent to which the Projects materially affect the ability to achieve national targets for decarbonisation. This is considered against the UK carbon budgets, including the relevant CCC sectoral allocations and the UK carbon target of 'net zero' in 2050.
- 7.1.10 The contributions of greenhouse gas emissions from the Projects have been qualitatively considered in the context of regional territorial greenhouse gas emissions. This point of comparison shows that if construction emissions reached 1% of the UK Carbon Budget, then the total greenhouse gas emissions would be the same as those combined for Cambridgeshire, Lincolnshire and Norfolk. In practice, the emissions will be much lower.
- 7.1.11 The operation of the Projects will have a lower impact than the construction stage, given minimal maintenance/repair requirements and no significant fuel or water requirements in operation.
- 7.1.12 The Projects are assessed as having a minor (adverse) effect and therefore as being not significant.

7.2 Cumulative Effects

- 7.2.1 The approach to the cumulative effects assessment will follow the advice and guidance provided by the Planning Inspectorate and will be discussed with the relevant local planning authorities. The assessment is divided into two different types of assessment.
- The first is where a single receptor is potentially affected by more than one environmental impact, for example, noise and visual impacts on the same residential property.
 - The second is where different projects combine to create an effect on a receptor, for example, the combination of the Project and another nearby proposed development, which together might affect the same residential property.
- 7.2.2 Further details of the Cumulative Effects assessment can be found in **Volume 1, Part 4, Chapter 28: Cumulative Assessment**.
- 7.2.3 At this stage of the Projects, a review of planning applications, including those in relation to Nationally Significant Infrastructure Projects, planning permissions, other relevant information and local authority site allocations has been undertaken across a defined geographical area. These have been collated into a 'long list' which has then been reviewed to identify a 'short list' of potential developments which will be assessed in further detail as part of the ES. The long list of other developments is shown in **Volume 3, Part 4, Figure 28-1 English Onshore Scheme Cumulative long list of other developments** of the PEIR. The short list will be discussed and agreed with local planning authorities and any additional projects suggested by them, included in the short list. The short list of other developments is shown in **Volume 3, Part 4, Figure: 28-2 English Onshore Scheme cumulative short list of other developments** of the PEIR.
- 7.2.4 As outlined in **Chapter 1** of this NTS, EGL 3 and EGL 4 are two proposed new electrical connections being developed to reinforce the electricity transmission system between Scotland and England. However, the PEIR and this NTS specifically relate to the English components of EGL 3 and EGL 4. Where the construction crosses from one jurisdiction to the next, e.g. English to Scottish waters, there will be a continuation of effects along the linear project. These effects will be assessed as part of the

assessment of combined effects and are likely to be limited in spatial extent in proximity to the English - Scottish boundary and are not considered to be significant. The potential for combined effects will continue to be considered and where required, will be reported in the ES.

8. Next-Steps

8.1 What happens next?

- 8.1.1 The EGL 3 and EGL 4 statutory public consultation runs from 12 noon on Tuesday 13 May 2025 to 11.59 pm on Monday 23 June 2025. National Grid wants to hear the views of local people as well as organisations, such as Natural England and the local planning authorities (known as non-statutory and statutory consultees). Once consultation is complete, National Grid will consider all comments that have been received. These consultation responses will inform further design refinements and proposals for environmental measures to reduce impacts from the Projects. National Grid will continue to look at where there are options in the design such as the temporary quay and four location options for the Walpole converter stations and undertake further work to identify which options should stay in the design.
- 8.1.2 Based on consultation responses, design refinements and additional information that becomes available from site visits and surveys, the environmental assessment will be reviewed and updated for the final ES. It is expected that the ES to accompany the DCO application will be submitted in 2026.

8.2 What if I would like further information?

- 8.2.1 This document is a non-technical summary of the PEIR for the EGL 3 and EGL 4 Projects. The full PEIR, which provides more detailed and technical information is available to view on the following link: <http://nationalgrid.com/egl3andegl4>
- 8.2.2 A number of public information events will take place during the consultation period for members of the public to attend and find out more information about the Projects, as listed in **Table 8-1**.

Table 8-1 – Public information events

Location	Date	Time	Address
Burgh le Marsh	Wednesday 21 May 2025	2pm – 7pm	Burgh le Marsh Village Hall, Jacksons Ln, Burgh le Marsh, PE24 5LA
Huttoft	Thursday 22 May 2025	2pm – 7pm	Huttoft Village Hall, Sutton Rd, Alford, LN13 9RG
Eastville	Saturday 24 May 2025	2pm – 7pm	Eastville, Midville and New Leake Village Hall, Station Road, Eastville, PE22 8LS
Walpole	Thursday 29 May 2025	2pm – 7pm	Walpole Community Centre, Summer Close, Walpole St Andrew, PE14 7JW
Alford	Saturday 31 May 2025	2pm – 7pm	Alford Corn Exchange, 9 Market Place, Alford, LN13 9EB

Location	Date	Time	Address
Kirton Holme	Tuesday 3 June 2025	2pm – 7pm	Poachers Country Hotel, Swineshead Road, Kirton Holme, PE20 1SQ
Holbeach	Wednesday 4 June 2025	2pm – 7pm	The Holbeach Hub, Boston Road South, Holbeach, PE12 7LR
Tydd St Giles	Thursday 5 June 2025	2pm – 7pm	Tydd St Giles Community Centre, Broad Drove East, Wisbech, PE13 5LN

8.2.3 Copies of our maps and technical documents, including the PEIR, will also be available to view at the public information events.

8.2.4 A series of Q&A webinar sessions will also be held throughout the consultation period. Details on how to sign up for a webinar are available on the website or by contacting National Grid via the details below.

8.2.5 These sessions are themed as follows:

- Webinar 1: English Offshore Scheme proposals: Friday 23 May 12pm – 1pm
- Webinar 2: Anderby Creek Landfall to Candlesby: Thursday 5 June 7pm – 8pm
- Webinar 3: Candlesby to Frith Bank: Tuesday 10 June 7pm – 8pm
- Webinar 4: Frith Bank to South Holland Drain: Friday 30 May 12pm – 1pm
- Webinar 5: South Holland Drain to Walpole area: Thursday 12 June 12pm – 1pm

8.2.6 You can also book a ‘team call-back’ session with the project team by contacting the number below.

8.2.7 If you have any questions, contact National Grid or visit the dedicated Projects website, where you can view the consultation materials, give feedback and learn more about the consultation events and proposals. Alternatively, you can view paper copies of consultation materials at the local information points.

8.2.8 For more information see the Projects website, or get in touch via the contact details below:

- Website: <http://nationalgrid.com/egl3andegl4>
- Email: contactegl3and4@nationalgrid.com
- Freephone line: 0800 298 0405 (Mon-Fri, 9am-5pm)
- Write to: Freepost EASTERN GREEN LINKS 3 & 4

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com