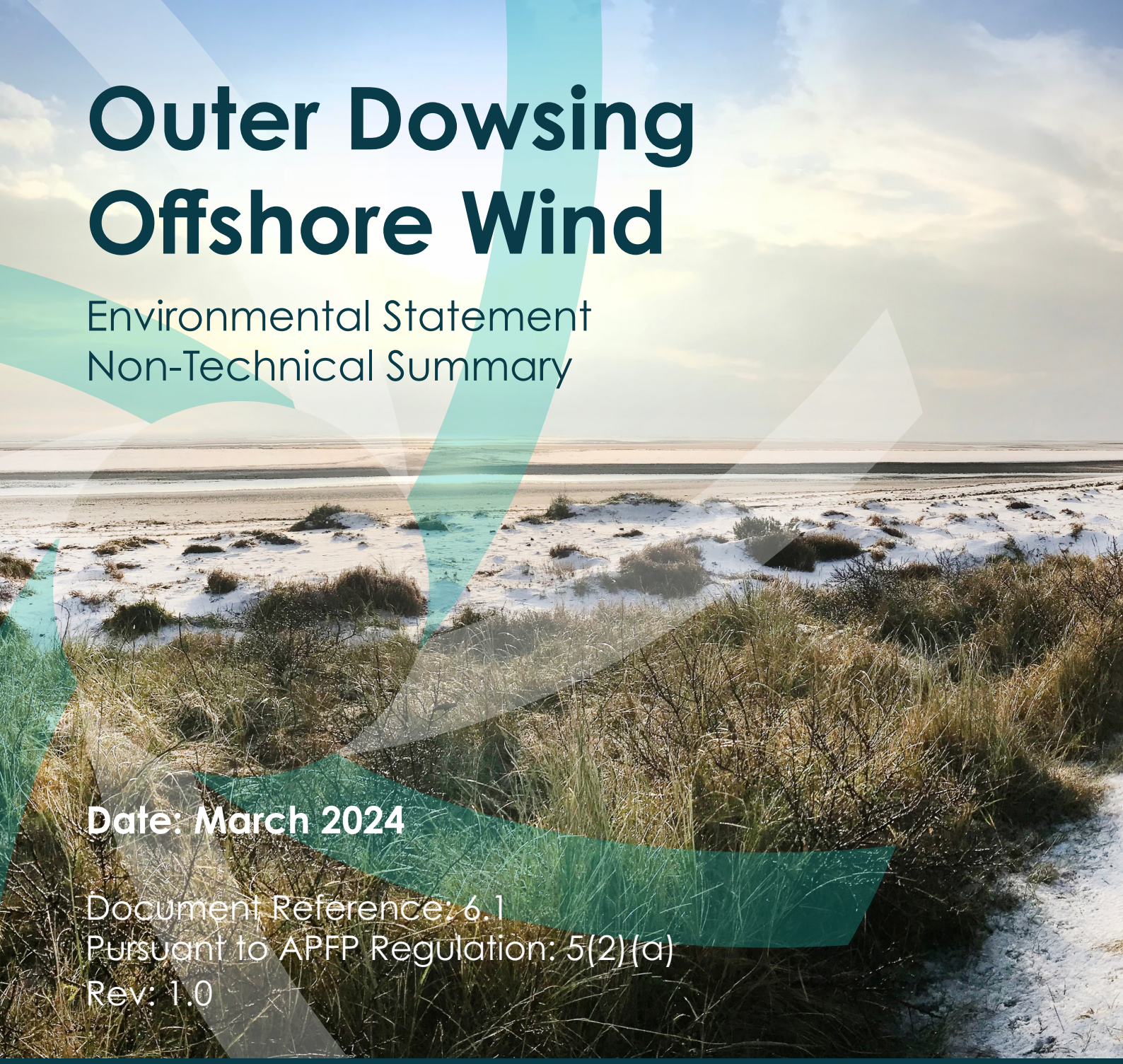
Outer Dowsing Offshore Wind

Environmental Statement
Non-Technical Summary



Date: March 2024

Document Reference: 6.1
Pursuant to APFP Regulation: 5(2)(a)
Rev: 1.0

OUTER DOWSING
OFFSHORE WIND

Introduction

What is this Document for?

This is the Non-Technical Summary (NTS) of the Environmental Statement (ES) for Outer Dowsing Offshore Wind ('the Project'). The purpose of this NTS is to provide a high-level non-technical overview of the Project, the site selection process and the key findings of the Environmental Impact Assessment (EIA) process. For further information on the EIA and the full assessments, please refer to the ES.

The Project is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 and the Applicant therefore requires a Development Consent Order (DCO) to construct, operate and decommission the Project.

The ES provides the environmental information which has been gathered and the assessment of the likely significant effects of the Project on the receiving environment as a result of construction, operation and decommissioning. The ES accompanies the application for a DCO made to The Planning Inspectorate.

The full ES can be downloaded from: https://infrastructure.planninginspectorate.gov.uk

What is "The Project"?

Outer Dowsing Offshore Wind ("The Project") will be an offshore windfarm located approximately 33miles (54km) off the coast of Lincolnshire.

The Project includes the offshore and onshore infrastructure required to transmit the power generated by the wind turbines to an onshore substation (OnSS) at Surfleet Marsh and subsequently into the National Grid Transmission System. The Project location and boundaries (known as Order Limits) are shown in the Location Plan Onshore (document reference 2.3) and the Location Plan Offshore (document reference 2.4). The main components of the Project are outlined in section 3.2.

The Project has a total installed capacity of 1.5GW which is roughly equivalent to the annual electricity consumption of over 1.6 million UK households. Full details of the Project can be found in the ES Volume 1, Chapter 3: Project Description (Document reference 6.1.3).

To allow some level of design flexibility, and further refinement during detailed design once consent is granted, the Project has adopted an approach which assesses a 'worst case scenario'. The EIA is therefore based on the Maximum Design Scenario (MDS) for the Project. The MDS includes the parameters for the Project's infrastructure, in terms of footprint, physical presence and capacity, that would result in the greatest potential for change in relation to each impact assessed. By defining an MDS, any potentially significant effects of the Project can be identified and consulted upon.

The purpose of the ES is to present the potential impacts from the construction, operation and decommissioning of the project, highlighting significant impacts and showing how these can be mitigated. Proposed mitigation measures are then secured through mechanisms such as the Project's DCO, certified documents (outlines of some of these have been provided within Part 8 of the Application materials), and bilateral agreements with parties such as landowners. The Project can only be built if the required mitigations are adhered to.

Who is developing Outer Dowsing Offshore Wind?

Outer Dowsing Offshore Wind is being developed as a joint venture between TotalEnergies, Corio Generation and Gulf Energy Developments. The Applicant is GTR4 Limited, the joint venture's legal name and registered leaseholder.

TotalEnergies, a global multi-energy company, has expertise in offshore operations and maintenance thanks to its historical activities. TotalEnergies is already developing and building offshore wind projects with a cumulative capacity of approximately six gigawatts (GW), including three floating offshore wind projects in Europe and Asia. As part of its ambition to get to net zero by 2050, TotalEnergies is building a portfolio of activities in renewables and electricity that should account for up to 40% of its sales by 2050. At the end of 2020, TotalEnergies' gross power generation capacity worldwide was around 12GW, including 7GW of renewable energy. TotalEnergies will continue to expand this business to reach 35GW of gross production capacity from renewable sources by 2025, and then 100GW by 2030 with the objective of being among the world's top 5 in renewable energies.

Corio Generation is a specialist offshore wind business, dedicated to harnessing the world's greatest energy supply. With a unique blend of sector-leading expertise and deep access to long-term capital, Corio applies a long-term partnership approach to the creation and management of projects, taking them from origination, through development and construction, and into operations. Corio's 15GW pipeline is one of the largest in the world, spanning established and emerging markets, as well as floating and traditional fixed-bottom technologies. These next generation offshore wind projects will help form the backbone of the net-zero global energy system while meeting the energy needs of communities and corporate off takers sustainably, reliably, safely and responsibly. Corio Generation is a Green Investment Group (GIG) portfolio company, operating on a standalone basis. GIG is a specialist green investor within Macquarie Asset Management, part of Macquarie Group.

Gulf Energy Development (GULF) is a holding company headquartered in Thailand that invests in a global portfolio of energy, infrastructure, and digital and telecommunications businesses. GULF brings close to three decades of experience in energy project management and operation, with a mission to invest in businesses related to renewable energy and climate management, in accordance with the global target to achieve net zero emissions by 2050. As one of Thailand's largest private power producers with over 20 GW of gas-fired and renewable capacity, GULF is committed to supporting the energy transition with onshore and offshore wind projects, solar projects, and other contributions to energy security across various regions to create sustainable shared value in all spheres where it operates.

Need for the Project

The United Kingdom's (UK) Government has an ambition to deliver 50GW of renewable energy from offshore wind by 2030. The Project will make a significant contribution both to the achievement of UK decarbonisation targets and towards the global need to minimise impacts on climate change.

The Project also actively contributes to the United Nations Sustainable Development Goal number 13 target in helping combat climate change and it's impacts, as well as actively contributing to Goal 7 by ensuring access to affordable, reliable, sustainable and modern energy to the UK population.

As part of the UK Government's strategy, investing in offshore wind generation has been listed as the number 1 point in the UK Government's '10 Point Plan[3]', to contributing to carbon net zero by 2050. The British Energy Security Strategy[4] is anticipated to support 90,000 jobs in offshore wind by 2028, with a goal of accelerating offshore wind deployment, ensure energy security and stabilise consumer prices in the longer term. The Project represents an essential contribution to the 50GW by 2030 ambition set by the UK, with the development programme focused on ensuring the Project is generating by 2030. The Project is able to contribute to this because it has secured a connection to the National Grid. As discussed in the strategies and government incentives above, offshore wind projects such as the Project, offer the UK a wide range of additional benefits including economic growth, energy security and decarbonisation.

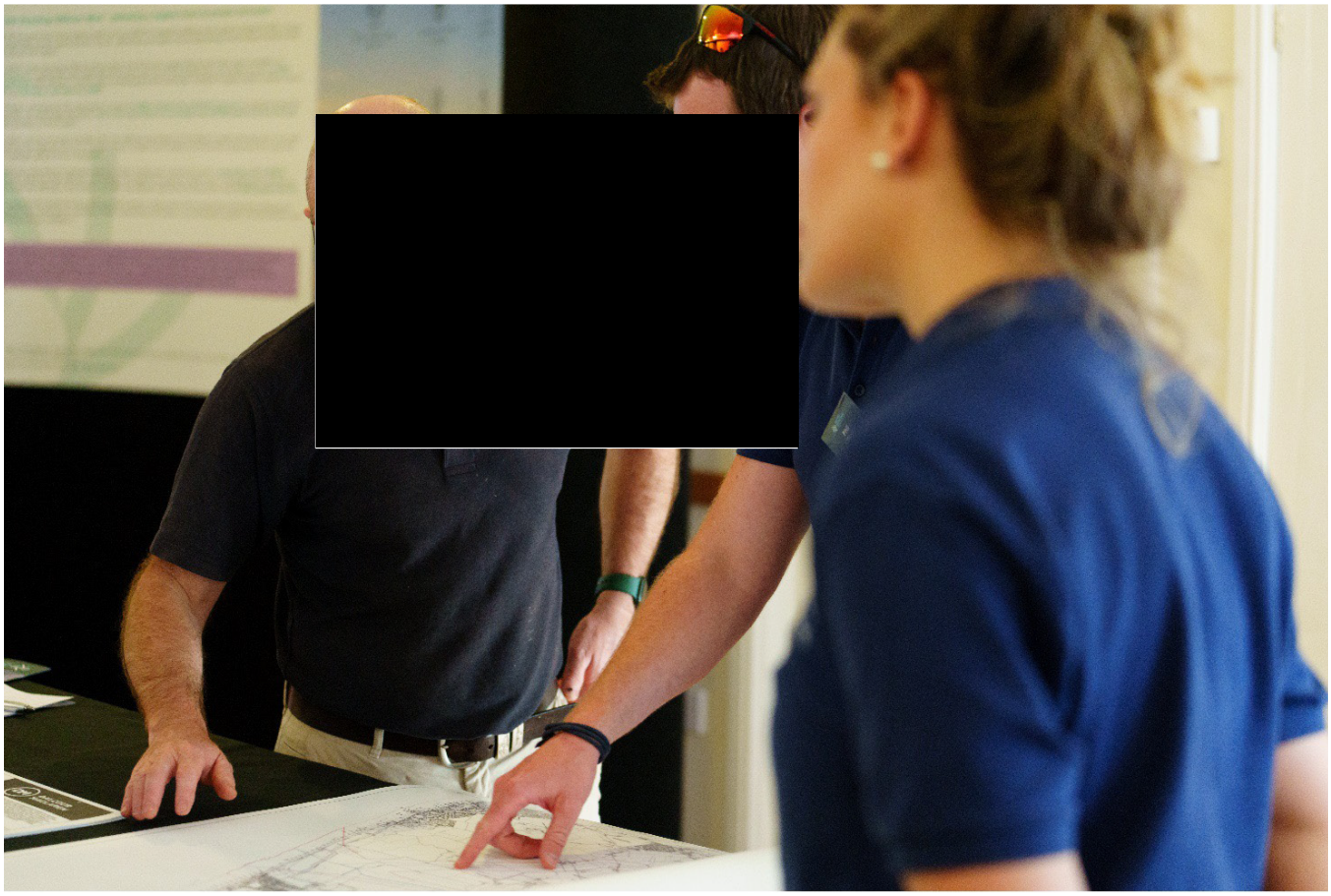
1. https://www.globalgoals.org/goals/13-climate-action/
2. https://sdgs.un.org/goals/goal7
3. https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution/title
4. https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

Consultation Timeline

Consultation began when the project launched in October 2022 and since then we have engaged a wide range of stakeholders using a wide variety of communication channels.

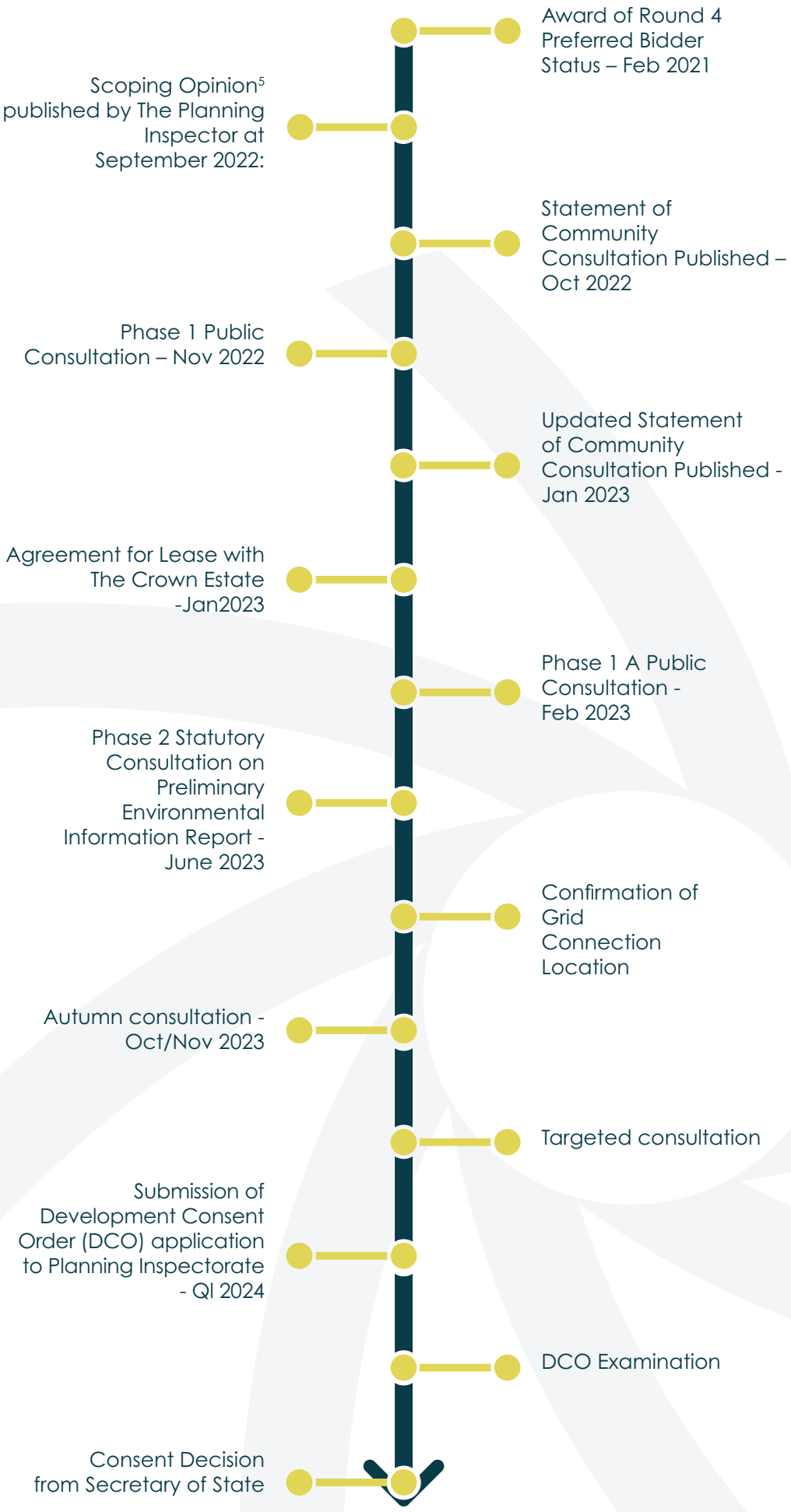
During the EIA process, various rounds of consultation were held:

- Scoping Report publication;
- Five consultation phases: Phase 1, Phase 1a, Phase 2, Autumn and Targeted Winter consultation;
- Engagement with relevant stakeholders though the Evidence Plan Process (EPP); and,
- Bilateral and multilateral consultations, between the Applicant and other relevant stakeholders (such as the local planning authority), on either a one-to-one or multi-party basis.



The Outer Dowsing Offshore Wind team talk to local residents at the Public Information Day in Anderby, Summer 2023.

5. https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010130/EN010130-000035-EN010130-Scoping-Opinion.pdf


Award of Round 4 Preferred Bidder Status – Feb 2021
Scoping Opinion[5] published by The Planning Inspector at September 2022:
Statement of Community Consultation Published – Oct 2022
Phase 1 Public Consultation – Nov 2022
Updated Statement of Community Consultation Published - Jan 2023
Agreement for Lease with The Crown Estate -Jan2023
Phase 1 A Public Consultation - Feb 2023
Phase 2 Statutory Consultation on Preliminary Environmental Information Report - June 2023
Confirmation of Grid Connection Location
Autumn consultation - Oct/Nov 2023
Targeted consultation
Submission of Development Consent Order (DCO) application to Planning Inspectorate - Q1 2024
DCO Examination
Consent Decision from Secretary of State

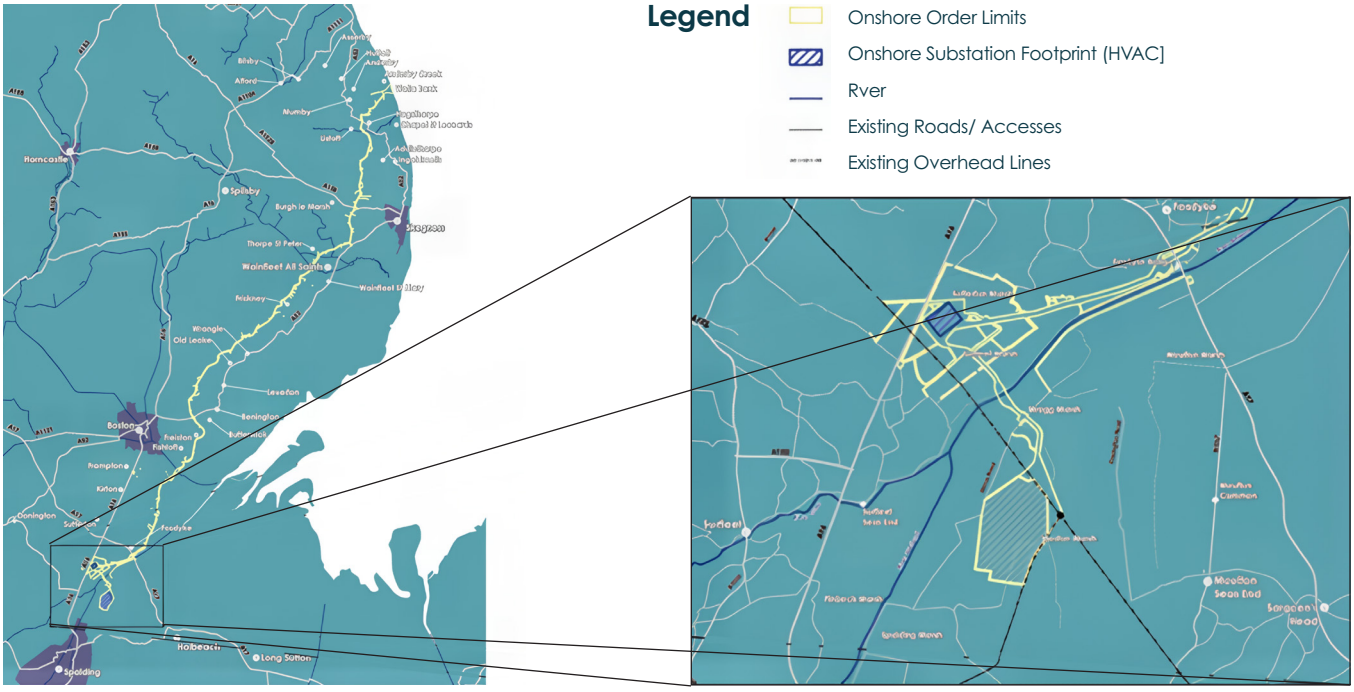
Key Project Elements

The Project comprises an offshore generating station (the wind farm), and offshore and onshore transmission infrastructure which is required to connect the offshore wind farm to the National Grid – which supplies the electricity from the wind farm into people's homes as well as compensation areas for potentially affected wildlife.

The offshore and onshore transmission infrastructure has been defined based on the confirmed grid connection point for the Project at Weston Marsh (See Section 3.2). This followed a detailed process undertaken by National Grid to identify the most appropriate locations through a process known as the Offshore Transmission Network Review.

The ES describes the Project's 'Order Limits' which are the areas within which the Project can be built and operated. The Order Limits for the onshore and offshore parts of the Project have been refined through the EIA process (See Section 3.2) and following extensive consultation with stakeholders.

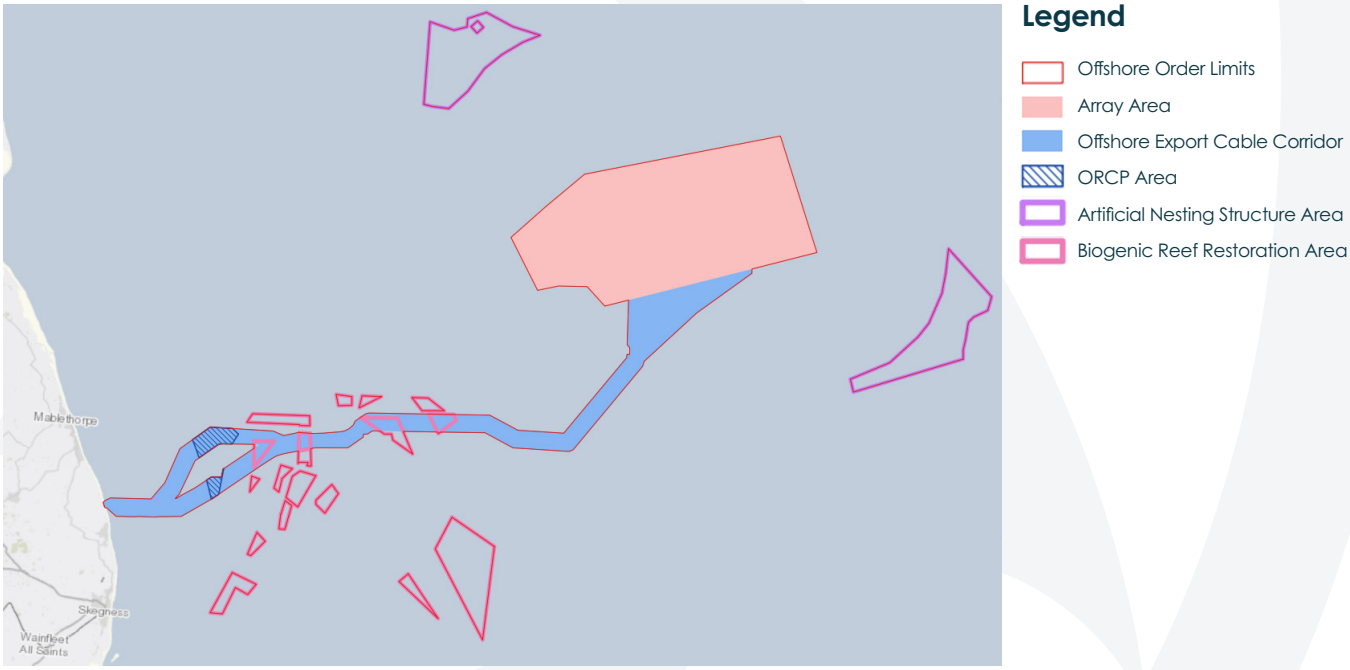
The offshore Order Limits include the offshore wind farm array area, refined to 436km^2 for the DCO application, and the offshore export cable corridor (Offshore ECC), running from the array area to landfall at Wolla Bank, to the south of Anderby Creek on the Lincolnshire coast, within which the offshore export cables will be placed.



The onshore Order Limits include the landfall compound at Wolla Bank, the onshore export cable corridor (Onshore ECC), within which onshore export cables will be placed, the Project's onshore substation (OnSS) at Surfleet Marsh, and the 400kV cable corridor between the OnSS and the National Grid substation (NGSS). The NGSS will be built, owned, and operated by the National Grid Electricity Transmission (NGET) and it is anticipated that this will be located within, or near to, an area identified by the Project as the 'Connection Area'.

Offshore Project Elements

The offshore elements of The Project will comprise an offshore wind turbine array, along with offshore platforms, offshore export cables and array cables to connect the electricity generated to the National Grid.



Offshore Order Limits.

The key offshore assumptions are:

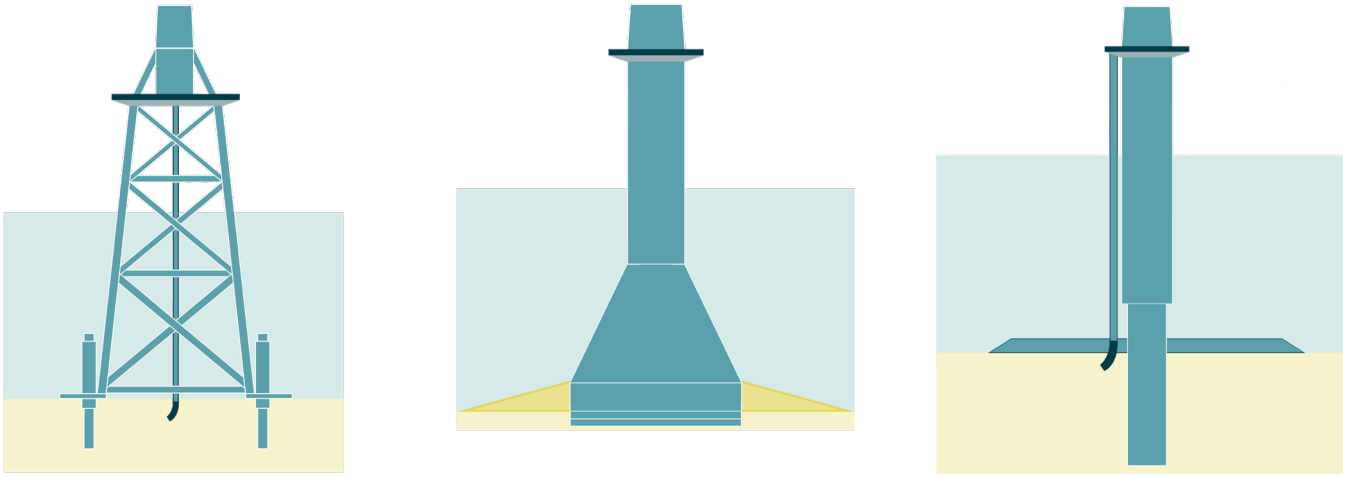
- Up to 100 wind turbines with a maximum tip height of 40m;
- Up to four offshore substations;
- Array and interlink cables;
- Up to two offshore reactive compensation platforms (ORCPs);
- Up to four offshore export cables;
- Up to two Artificial Nesting Structures and Biogenic reef compensation areas (if required).

The offshore elements of the Project along with a brief description of their function and purpose is provided below:

Wind Turbine Generators

Wind turbine generators (WTG) are comprised of a foundation and a tower with a nacelle at its tip housing the electrical equipment, a gearbox and generator. The turbine blades are attached to the front of the nacelle and these capture energy from the wind causing them to turn, transforming the wind energy via the generator into electricity.

Foundation Types



Jacket | Gravity base | Monopile

All WTGs and offshore structures such as the platforms will be fixed to the seabed. The choice of foundation type and design is dependent on the seabed conditions and the infrastructure that is being supported and will be defined after consent is granted.

Offshore Substations

Offshore substations (OSSs) collect the electricity generated by the WTGs and transmit it to the National Grid. The offshore substation will be located within the array area of the Project.

Offshore Accommodation Platform

The Offshore Accommodation Platform (OAP) will allow personnel to perform operation and maintenance work in the offshore wind farm, enabling them to stay on site thereby reducing the number of crew transfers via boat or helicopter during the operational phase.

Offshore Cables

Subsea cables are required to transmit the generated electricity to the landfall. Cables will connect the wind turbines within the array to the offshore substations (known as inter-array cables) and connect the OSSs (interlink cables). Cables are also required to connect the OSSs to the onshore cables at landfall (export cables). Export cables will be placed within the offshore Export Cable Corridor (ECC).

Offshore Reactive Compensation Platforms

Offshore Reactive Compensation Platforms (ORCPs) are required for long distance, High Voltage Alternating Current (HVAC) cables to maximise the amount of power delivered to the National Grid.

Cable Protection, Scour Protection and Cable Crossings

Where possible, cables will be protected by burying them. Where this is not possible, cable protection such as rock placement will be required. Where the Project's cables are required to cross existing cables or pipelines, cable protection will also be needed.

Artificial Nesting Structures

A number of artificial nesting structures (ANS) may be installed to attract vulnerable seabird species such Kittiwake and Guillemot whose populations could be affected by the Project. Each structure will offer multiple nesting spaces to allow affected species to continue to introduce enough new chicks into the population. The Project has produced a bird specific compensation strategy which commits to a number of measures to reduce any impact as a result of its construction or operation. Details of which are provided within the Report to Inform Appropriate Assessment (RIAA) which is a part of the DCO application.

Biogenic Reef

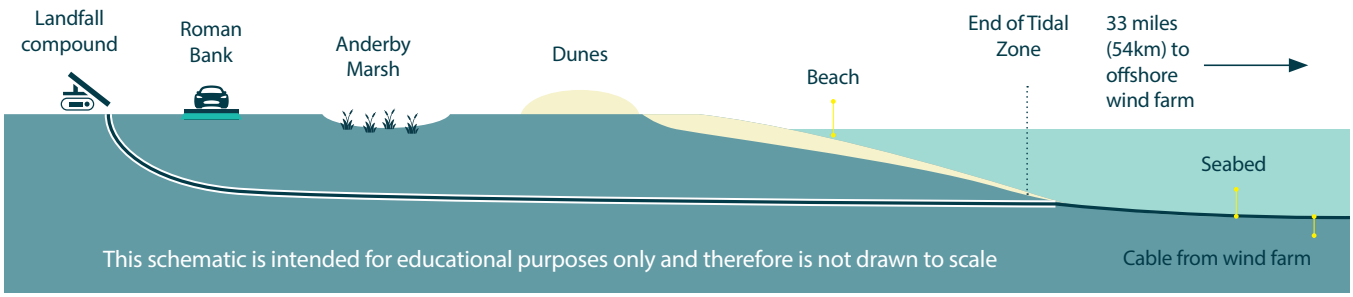
Biogenic Reefs are made up of hard matter created by living organisms. In the event that compensation may be required, the Project has submitted a without prejudice biogenic reef mitigation plan, which will be based on the In Principle Southern North Sea Special Area of Conservation Site Integrity Plan which accompanies the DCO application. This is an established and reliable mitigation measure to minimise any impacts to biogenic reefs which may be present.

Landfall

This is the area where the offshore export cables will come ashore at Wolla Bank, Lincolnshire, south of Anderby Creek.

At the landfall, ducts will be installed underneath the beach, the dunes, the Anderby Marsh Local Nature Reserve (LNR) and Roman Bank Road using a method known as Horizontal Directional Drilling (HDD). The offshore cables will then be joined to the onshore cables in the Landfall Compound located west of the coastal Roman Bank road.

Infographic showing the plans to install the cable at landfall using Horizontal Directional Drilling

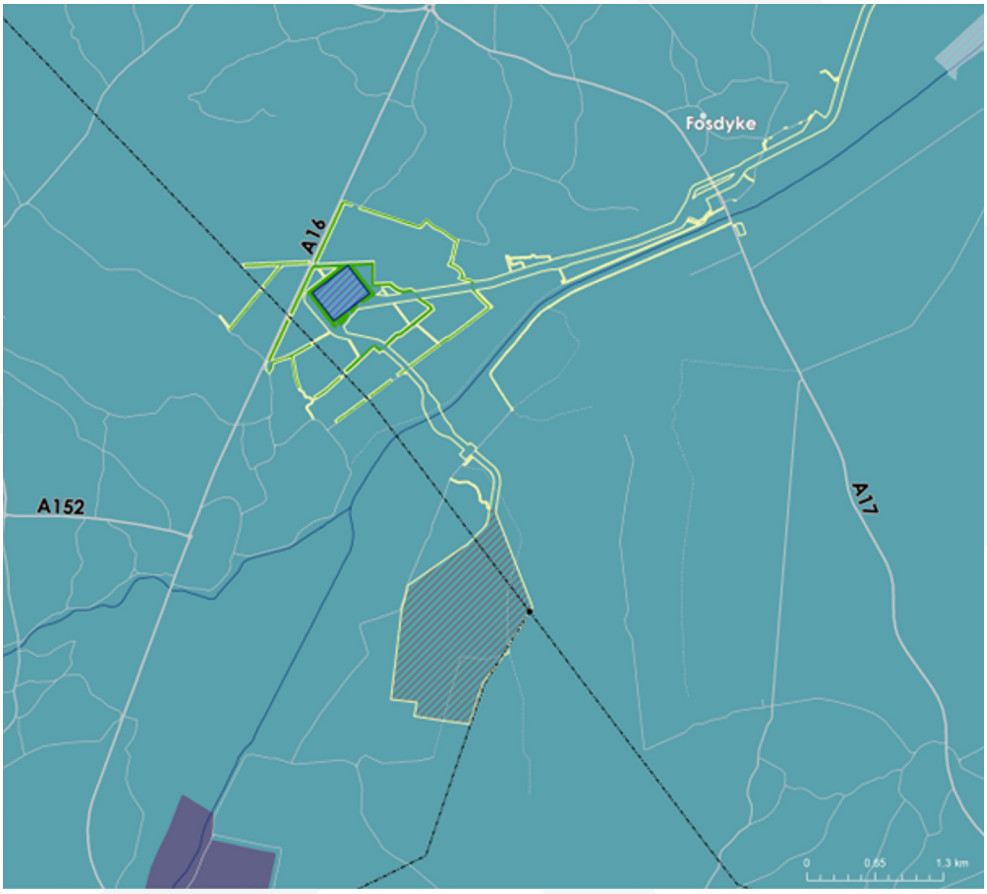


The Project will not require any access to the beach during construction in order to ensure no impact on public access and amenity.

Onshore Project Elements

The Project landfall is located at Wolla Bank, south of Anderby Creek. Onshore export cables will be installed underground and connect to a the Project's onshore substation (OnSS) located at Surfleet Marsh. 400kV cables will then connect the OnSS to a new National Grid substation (NGSS) which will connect the Project to the existing overhead lines. An indicative Connection Area for the NGSS can be seen in the illustration below.

Outer Dowsing Offshore Wind Onshore Substation location and National Grid Onshore Substation Connection Area



The key onshore assumptions are:

- Up to 4 export cable circuits
- Maximum cable voltage of 275kV for onshore export cables which is approximately 70 km in length and Maximum cable voltage of 400kV for the 400kV cable corridor which is approximately 4 km in length
- Maximum trench depth of up to 3 m
- Cable burial depth of between 2 and 25 m in locations where trenchless methodology will be used.

Onshore Export Cable Corridor (ECC) and 400kV cable corridor

The Onshore Export Cable Corridor (ECC) is where up to 70km of underground cabling (export cables) between Wolla Bank and Weston Marsh will be placed to allow power to be transferred from the landfall to the Project's onshore substation and ultimately into the National Grid Transmission System.

The export cables will be placed in up to four trenches. Construction compounds, temporary access routes and a temporary haul road will also be required.

Whilst the width of the cable corridor may change along the route to account for specific environmental or engineering constraints, the Project will typically require a working width of 80m during cable construction, reducing to 60m wide post construction.

Onshore Substation (OnSS)

The OnSS will contain the electrical components that are needed to transform and convert the power from the wind turbines to match the power in the National Grid Transmission System.

The Project has committed to a single transmission technology type - High Voltage Alternating Current (HVAC). This technology means a smaller onshore substation will be required, reducing the visual impacts associated with the permanent above ground infrastructure.

The Project has retained the option for two types of technology for the onshore substation: Air Insulated Switchgear (AIS) and Gas Insulted Switchgear (GIS). The type of technology adopted has an impact on the maximum footprints and heights of the onshore substation as can be seen in Table 1.

The selection of substation technology will be made during the detailed design phase and will be dependent on suitability and availability during the procurement process.

The maximum footprint of the Project's OnSS is outlined below.

Table 1 - Maximum of the OnSS

Parameters	Maximum Design Envelope (m^2)
Maximum number of onshore substations	1
Maximum OnSS footprint (up to fenced perimeter) (AIS) (m^2)	144,000
Dimensions of OnSS (up to fenced perimeter) (AIS) (Length m x Width m)	428 x 335
Maximum OnSS footprint (up to fenced perimeter) (GIS) (m^2)	72,600
Dimensions of OnSS (up to fenced perimeter) (GIS) (Length m x Width m)	270 x 268.5
Maximum permanent footprint of OnSS including associated infrastructure (drainage, access requirements, onsite landscaping) (m^2)	261,500
Indicative OnSS temporary commissioning compound area (m^2)	
(Within the OnSS PCC footprint)	5,400
Maximum building height (GIS) (m)	16.5
Maximum building height (AIS) (m)	13
Maximum lightning protection height (m)	30

400kV Cable Corridor

The National Grid Electricity System Operator (NGESO) confirmed that final grid connection point for the Project will be into a new National Grid substation (NGSS). This will be developed, consented and operated by NGET and does not form part of the DCO application.

NGET has indicated that the NGSS will be located near Weston Marsh in an indicative search area known as the Connection Area.

The Project will construct a 400kV cable to transmit power from the OnSS to the NGSS. The 400kV cable will be buried over its 4km length in a corridor approximately 60m wide.

Preparatory work

Before the onshore installation works for the Project can begin, site preparation works will be required. These could include:

- Pre-construction surveys;
- Minor works to facilitate the use of existing enabling accesses;
- Road/junction modifications and any new junctions off existing highways;
- Hedgerow removal and vegetation clearance;
- Ecological mitigation;
- Archaeological mitigation; and
- Drainage management.

Temporary Construction Compounds (TCC's)

Temporary construction compounds of various sizes will be required within the Project's onshore footprint, for laydown and storage of materials, plant and staff, as well as space for small temporary offices, welfare facilities, security and parking. Compounds will also be required for crossings (such as roads and rivers) to site operations such as drilling works.

During the intertidal works for the Project, a Landfall Compound will be required. This will include housing the Transition Joint Bay (TJB) works and any drilling works.

All construction compounds are temporary and the site will be reinstated following completion of the construction works, however it may be necessary to retain some compounds for slightly longer periods during the commissioning stages of the Project.

Access and Haul Roads

A temporary haul road will be constructed to provide access to the Project's onshore infrastructure instead of relying on the main roads. The temporary haul road, typically 6.8m wide (up to 9m at passing places) will limit damage to the agricultural land and reduce construction traffic on the main road networks. This will extend the entire length of the Project onshore ECC and 400kV cable corridor (except where the Project has committed to not construct a haul road, such as in locations where trenchless techniques will be adopted).

Operations and Maintenance

Once construction of the Project is completed and the wind farm is fully commissioned, it will enter into the operations and maintenance (O&M) phase. Upkeep of the infrastructure will be ongoing throughout the Project's lifetime; this will entail works such as routine servicing, component replacement, painting and cleaning, repairs, and remedial works. The O&M phase of the Project is anticipated to be approximately 35 years.

The OnSS will be an unoccupied installation with no on-site presence required except for routine maintenance and emergency repairs.

The OnSS will be monitored and operated remotely from a separate control room at a site which is yet to be determined but does not form part of the OnSS.

The OnSS is capable of operating 24 hours a day 365 days a year, with shut downs only for planned or scheduled maintenance.

There are a number of components within the OnSS which could produce sound, the key OnSS operational plant sound power levels areas throughout the lifetime of the project are shown in

Decommissioning

At the end of the operational life of the Project it will be decommissioned. It is expected that all offshore structure above the seabed along with the subsea cables will be removed, while it is expected that the onshore cables will be left in place to avoid additional negative impacts because of their removal.

Prior to any decommissioning works, a decommissioning plan will be agreed with the relevant authorities and regulators.

Construction Programme

The construction programme shown below highlights the likely durations required for installation of the major elements of the Project and how they relate to one another.

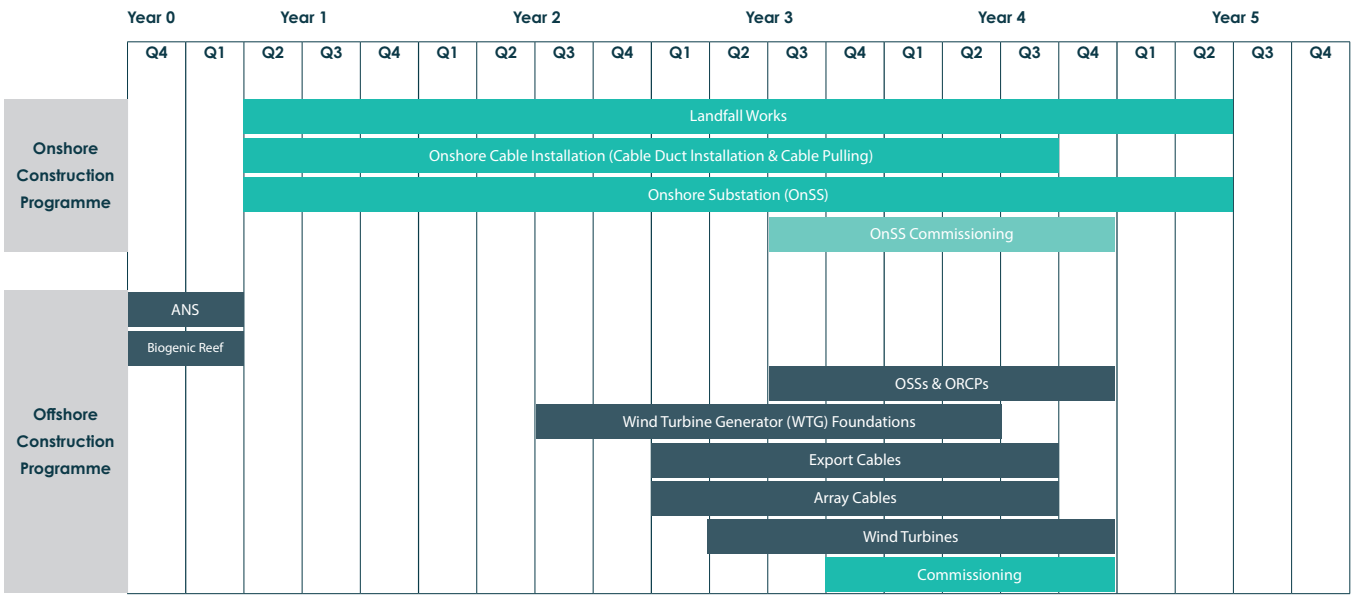


Plate 3.1 Indicative Construction Programme

Site Selection and Project Design Refinement

An iterative approach was taken to the site selection process in both the consideration of alternatives and in the final refinement of the Order Limits for both the offshore and onshore elements of the Project.

An initial stage 1 bidding and stage 2 auction process was carried out where the Applicant was awarded preferred bidder status in February of 2021.

On award of preferred bidder status, the Applicant commenced work to determine options for the connection of the Project to the National Electricity Transmission System, through the development of offshore and onshore export cable route options, cable landfall options and grid connection options.

Upon being awarded preferred bidder status the Applicant has completed multiple surveys which began in March 2021 including aerial bird (ornithology) surveys and marine mammal surveys.

Following this The Crown Estate (TCE) completed a Habitats Regulations Assessment (HRA) in July 2022 and an Agreement for Lease (AfL) was signed by the Applicant in January 2023.

The Applicant initially considered two substation sites in line with two connection options proposed by National Grid, which were referred to as Lincolnshire Node and Weston Marsh.

A Scoping Report was prepared and published in July 2022 detailing the proposed scope of the EIA, while a Preliminary Environmental Information Report (PEIR) was published in June 2023 which was used to inform the statutory and non-statutory consultation process.

In August 2023 the Applicant was notified that by the National Grid Energy Systems Operator (NGESO) that the confirmed grid connection for the Applicant would be Weston Marsh.

Further details on defining both the offshore and onshore Order Limits including the Array area, Offshore ECC, Landfall, Onshore ECC and OnSS locations are detailed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives (document reference 6.1.4) with an overarching summary provided throughout section 4. The consultation that has been undertaken and that has informed the iterative design process of the Project is summarised in Consultation Report (document reference 5.1).

Our Array Area

In October 2019, The Crown Estate (TCE) launched Offshore Wind Leasing Round 4 (commonly referred to as Round 4) for seabed rights to develop offshore wind projects in English and Welsh waters.

The location for the Project's array area was selected through the consideration of various environmental and engineering/technical constraints and, following an auction process, the Project was awarded Preferred Bidder status for the Project array area in February 2021.

The Project array area (where WTGs will be located) has been refined from 500km^2 to an area of 436km^2. The array area lies approximately 33 miles (54km) east of the Lincolnshire coast at its closest point. Should the Project be awarded development consent, the area in which WTGs will be located will likely be reduced further post consent as part of detailed design.

Landfall

The Project was able to evaluate landfall options along the Lincolnshire Coastline, based on economic and environmental viability. Following site visits and technical assessments, it was determined that a landfall at Wolla Bank was the most optimal landfall site.

Offshore Export Cable Corridor

Multiple Offshore ECC options were identified. Routeing for the Offshore ECC was highly constrained by a combination of protected sites, known wrecks, other marine users, and the Inner Silver Pit bathymetric feature. The final selected Offshore ECC exits to the south of the array area, with a fan leading from the southern edge of the array. The Offshore ECC crosses two existing pipelines to the south of the array area, before turning west to pass through the Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (SAC), south of the existing Triton Knoll offshore windfarm export cables. At the western extent of the Inner Dowsing, Race Bank and North Ridge SAC, the Offshore ECC splits, to provide optionality on final routing at this stage, before the two sections join to the east of Wolla Bank, where the ECC makes landfall.

Onshore Project Substation

The location of the OnSS has been dictated by the preliminary results of the OTNR as published in the HND Report by National Grid ESO (NGESO, 2022). The Project evaluated multiple substation site options in two different search areas: Lincolnshire Node (northwest of the preferred Wolla Bank landfall) and Weston Marsh (to the south of Boston). The preferred location of the OnSS at Surfleet Marsh was selected based on environmental and technical considerations, as well as proximity to the grid connection location.

Onshore ECC

The guiding principles for locating the Project's onshore ECC was to identify an economic, efficient and viable cable route corridor (i.e., as close as possible to the grid connection point and in as direct a line from the landfall to the grid connection point as possible) that does not, as far as practicable, give rise to significant adverse environmental impacts, including seeking to avoid residential properties and minimise disturbance from construction activities.

Site Selection

The onshore site selection process utilised expertise from specialists, including engineers, planners, land advisors, legal and environmental consultants. The location and design of the Project infrastructure has taken account of a wide range of environmental, physical and social considerations. The Applicant has undertaken extensive engagement to ensure that the Project refinement and designs were informed by all relevant parties. Engagement with stakeholders, communities, and landowners was undertaken through a range of methods such as in-person consultation events, virtual exhibitions, online events, leaflets, a website, expert topic groups and community liaison meetings. The Project has prepared a Consultation Summary Report (document 5.1) that details each stage of consultation undertaken.

The Environmental Impact Assessment Process

Purpose of an Environmental Impact Assessment

The purpose of EIA is to identify any potential environmental effects arising from the development and then to propose the means to avoid and reduce any significant impact. This information is then presented in an ES to assist regulators in the decision-making process.

Assessments are made on the significance of an effect on a wide range of receptors, including physical, biological and human, and mitigation measures are proposed to reduce any significant effects. Effects that remain after mitigation are reported as 'residual effects'.

To ensure a robust EIA, a range of potential construction methodologies and infrastructure design options have been considered, and the 'Maximum Design Scenario' has been presented and assessed for each parameter. This approach (referred to as the 'Rochdale Envelope') is well-established within large scale infrastructure projects. This ensures that the maximum design scenario (or worst-case scenario) is assessed, and no greater adverse environmental effects will occur over those predicted in the EIA.

Consultation on an Environmental Impact Assessment

The EIA considers all relevant topics, both offshore and onshore. The topics included within the EIA are agreed with the Planning Inspectorate through the scoping process. The Project assesses which topics they believe need to be included in the assessments and the Planning Inspectorate and relevant statutory consultees provide a response through the Scoping Opinion. The Project's Scoping Opinion was received 9 September 2022[8] . Consultee feedback has been provided during two S42 Consultations received in July 2023 and November 2023.

In parallel with the EIA Process, consultation has been ongoing through the Evidence Plan Process. This includes consultation with a range of stakeholders through Expert Topic Groups (ETGs) facilitating discussions between key stakeholders and the Project technical teams.

The Project also took part in non-statutory consultations to discuss specific issues as well as the overall Project strategy.

8. https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010130/EN010130-000035-EN010130-Scoping-Opinion.pdf

Environmental Impact Assessment (EIA) Process

For each topic, a description of the baseline environment was identified through a combination of desk-based study, environmental surveys and consultation. The possible impacts were assessed throughout the lifetime of the Project, through construction, O&M and decommissioning and are presented within the relevant technical chapters of the ES.

The impacts of the Project have been assessed using a range of subjective and objective measures by which the significance of the impacts can be identified. Each topic describes the methodology used to determine and describe the key attributes listed below:

- Magnitude of impact on the receptor (Table 4)
- Sensitivity of the receptor (Table 5)
- Significance of the effect on the receptor
- The level of what is considered to be 'significant' in terms of EIA is set out within each topic area (Table 6).

Table 4 - Methodology for Determining Impact Magnitude

Magnitude of Impact	Criteria for assessing impact
Major	Total loss or major/substantial alteration to key elements/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/ alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a "no change" situation.

Table 5 - Methodology for Determining Sensitivity

Sensitivity	Examples of receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

Table 6 - Impact Significance Matrix

Sensitivity			
Magnitude	High	Moderate	Low
Major	Major Adverse/Beneficial	Major – Moderate Adverse/Beneficial	Moderate – Minor
Moderate	Major – Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor – Negligible
Negligible	Negligible	Negligible	Negligible

The EIA is made up three volumes as summarised below

- Volume 1 – These are the main technical chapters of the Environmental Statement (ES)
- Volume 2 – Consists of all accompanying figures to the technical chapters
- Volume 3 – Is made up of all the technical appendices which accompany the technical chapters in volume 1

Summary of Offshore Environmental Topics

This section summarises the results of the ES for each of the offshore EIA topics assessed. A guide to these topic chapters, including all associated ES documents and supporting submissions, is included in Appendix 1.

Marine Physical Processes

ES Chapter 7 (document reference 6.1.7) contains the assessment of the potential impacts of the Project on marine physical processes.

The study area is defined by a Zone of Influence (ZoI), based on Project-specific numerical modelling which extends to 10km to 15 km, conservatively. This represents the average distance travelled by the tidal flow on a mean spring tide (when the high tides are highest, and low tides are lowest). For activities within the array, the maximum movement in one cycle of the tide, matches the sediment plume created by our modelling.

The study area's existing environment has been detailed through the combined analysis of

- project-specific survey data, including metocean measurements,
- insights from nearby offshore wind farms like Triton Knoll and Race Bank, and
- information from regional coastal and seabed monitoring programs.

The baseline conditions were identified using data collected for the Project, a review of existing knowledge about this area, and numerical modelling and theoretical studies undertaken, to inform the assessment.

Seabed sediments range from large particle sizes that cannot be suspended in the water column if disturbed during construction, to smaller particles which are likely to be suspended in the water column but only for a limited period of time.

The Project has undertaken an initial Cable Burial Risk Assessment and a confidential sand wave levelling assessment, to inform the assessments within the ES. A further Cable Burial Risk Assessment will be undertaken to further inform the engineering works.

In the construction phase, potential impacts include increased Suspended Sediment Concentration (SSC), meaning there is a higher density of sediment particles in the water, which can lead to potential changes to seabed features, such as sandbanks. These effects are seen as minor, resulting in **no significant lasting effects.**

During the operation and maintenance phase, potential effects include potential seabed scouring, however this is deemed minor with **no significant lasting effects.**

In the decommissioning phase, similar effects to construction have been identified, involving increases in SSC and localised impacts on seabed features. Impacts are of **minor significance and temporary.**

The Project has committed to a range of mitigation measures to reduce impacts, such as the avoidance of sensitive environmental receptors where possible, burying offshore cables as far as practicable, the use of removable cable protection within the SAC, installing landfall cables within cable ducts installed using HDD technology. The Project will undertake a detailed Cable Burial Risk Assessment as part of its Cable Specification and Installation Plan which will be agreed with the MMO prior to construction.

Marine Water and Sediment Quality

ES Chapter 8 (document reference 6.1.8) comprises the assessment of potential impacts of the Project on Marine Water and Sediment Quality (MW&SQ).

The study area (offshore ECC) partially covers the Lincolnshire coastal waterbody. Coastal water quality is considered to be of moderate status overall, with excellent classifications for designated Bathing Waters. Integrated mitigation measures in the project design aim to minimize impacts on Marine, Water Quality and Sediment Quality.

During the construction phase, there might be minor, short term, localised deterioration in water quality due to an increase in suspended sediments, sediment-bound contaminants, and the release of drilling muds. However, these effects are assessed to be minor significant at worst, and no significant adverse residual effects anticipated.

Similarly, during the operation and maintenance phase, potential impacts on water quality are deemed of minor significance.

In the decommissioning phase, a minor deterioration in water quality from sediment suspension is assessed as of minor significance at worst. There are no significant residual effects expected.

The Project has committed a range of mitigation measures to reduce impacts including, undertaking a Cable Burial Risk Assessment and using cable protection where required. The Project will also develop plans including a Project Environmental Management Plan, a Scour Protection Management Plan, a Cable Specification and Installation Plan (drafts of which have been produced as part of the Application) and a Decommissioning Programme, which will be agreed with the MMO prior to works being carried out.

Benthic Subtidal and Intertidal Ecology

ES Chapter 9 (document reference 6.1.9) comprises the assessment of potential impacts of the Project on benthic and intertidal ecology.

The study area for the benthic intertidal ecology covers intertidal habitats up to the MHWS mark. The study area for benthic subtidal ecology covers approximately 10km at landfall to 15km from the Offshore ECC and 12km from the array area. Both the array area and the Offshore ECC have seabed (benthic) habitats typical of southern North Sea.

Seabed surveys were conducted to provide detailed understanding of the area. The survey results were used to produce habitat maps which informed the assessment. Analysis of samples collected across the array area and Offshore ECC have identified 11 different animal community types (biotopes), whilst analysis of samples from the Project ECC identified eight.

The array area does not overlap with any designated sites for nature conservation for seabed ecology, however the Offshore ECC does overlap with the Inner Dowsing Race Bank and North Ridge Special Area of Conservation, which is designated for reefs and sandbanks.

The examination of the construction phase focused on understanding potential effects of the Project on the underwater habitats within the Offshore ECC. Factors such as installation methods and the presence of structures on the seafloor were considered.

The impact assessment determined that the expected impact during construction is likely to be of minor or negligible significance. Therefore, the construction phase will have a limited adverse effect on underwater habitats. Within the operational phase, the potential impacts were assessed as minor or negligible.

In anticipation of the decommissioning phase, the potential impacts on underwater habitats were evaluated including the removal of infrastructure from the seafloor. Analysis concluded that minor or negligible impacts were expected during decommissioning.

Mitigation strategies, including micrositing of infrastructure where possible to avoid areas of Annex 1 reef, have been adopted. Within the SAC, the Project has also committed to removable cable protection, should cable burial not be possible. An initial Cable Burial Risk Assessment has been undertaken. A further Cable Burial Risk Assessment will also inform cable burial as part of a Cable Specification and Installation Plan which will be developed for approval by the MMO prior to construction. To minimise the risk of pollution, a Project Environmental Management Plan will be produced; this will also be used to reduce the risk of invasive species. The Project design has also been refined to include trenchless cable installation (HDD) to remove impacts at the coast.

Fish and Shellfish Ecology

ES Chapter 10 (document reference 6.1.10) comprises the assessment of potential impacts of the Project on fish and shellfish ecology.

The Project used a combination of site specific and existing data sources to establish the fish communities within the Project study area. Site-specific data collected within the array area and ECC undertaken by the Project included geophysical surveys, eDNA survey, Drop Down Videos, Benthic Grabs, epibenthic trawls and PSA analysis. The Project also used regional datasets and industry specific monitoring undertaken for a number of regional Offshore Windfarms. The fish communities in the vicinity of the Project array area and Offshore ECC are typical for this area of the western North Sea, there is an abundance of bottom dwelling species such as whiting and plaice, as well as sprat and mackerel. The Project also overlaps with areas used as fish spawning and nursery habitats for several species. Commercially important shellfish species are also present including brown crab, European lobster, and ocean quahog. A number of migratory fish species, some of which are of conservation interest, including Atlantic Salmon, sea and river lamprey and European eel are known to inhabit the region.

The potential environmental impacts associated with the construction, operation and decommissioning of the Project have been assessed across various categories. The potential impacts include mortality, injury, behavioural changes, and habitat disturbances.

Throughout the construction phase impacts are categorised as minor significance. Additionally, for each impact category, no significant adverse residual effects are anticipated after the implementation of the identified mitigation measures.

Throughout the operation and maintenance phase impacts are categorised as minor significance. Additionally, no significant adverse residual effects are anticipated after the implementation of the identified mitigation measures.

Furthermore, in the decommissioning phase impacts are categorised as minor significance. No significant adverse residual effects are anticipated after the implementation of the identified mitigation measures.

Mitigation measures include the development of a Cable Specification and Installation Plan (CSIP) to minimise habitat loss. Additionally, the implementation of a piling Marine Mammal Mitigation Protocol (MMMP) which details measure that will be implemented by the Project to limit the underwater noise levels to reduce the risk of auditory injury to negligible levels. Whilst the implementation of a MMMP is not aimed at fish and shellfish receptors, the measures detailed within it (such as soft start procedures) will provide benefit to mobile fish receptors. To minimise the risk of pollution, a Project Environmental Management Plan will be produced which will also be used to reduce the risk of invasive species.

Marine Mammals

ES Chapter 11 (document reference 6.1.11) comprises the assessment of potential impacts of the Project on marine mammals.

The Project used a combination of site specific and existing data sources to establish the baseline for marine mammals within the study area. The Project undertook site specific surveys including Digital Aerial Surveys, Marine Mammal Observer Surveys and Passive Acoustic Monitoring surveys. This was used alongside used regional/UK wide datasets and industry specific monitoring undertaken for a number of regional Offshore Windfarms The marine mammals most likely to occur in the vicinity of the Project are harbour porpoise, bottlenose dolphin, white beaked dolphin and minke whale and grey and harbour seals. Site-specific surveys identified that harbour porpoise is the most commonly occurring species within the Southern North Sea Special Area of Conservation, which is designated to help protect them.

During the construction phase, various impacts have been assessed, including UXO clearance, pile driving, vessel collisions, and water quality impacts. The clearance of UXO showed minor impact for minke whales,harbour porpoises, grey seals and harbour seals. The overall impact was assessed as negligible for all other species. Impacts of pile driving activities were found to have negligible impact for all species. Disturbances caused by other construction activities, vessel collisions, and vessel disturbance also exhibited minor to negligible significance for different species. With the implementation of the mitigation measures outlined above, the impact assessments show there will be no significant adverse residual effects on marine mammals.

In the operation and maintenance phase, operational noise, vessel collisions, and vessel disturbance were assessed. Operational noise had a minor significance for minke whales, with negligible significance for other species. Similarly, vessel collisions and disturbance showed minor significance for cetaceans and negligible significance for pinnipeds. Indirect impacts on prey and disturbance at haul-out sites were also considered but deemed to have negligible significance for all species. The mitigation measures put in place during this phase will address potential adverse effects, resulting in no significant residual impacts.

During the decommissioning phase, underwater noise, vessel collisions, vessel disturbance, indirect impacts on prey, water quality impacts, and disturbance at hail-out sites were evaluated. Most impacts were found to be of minor to negligible significance for various species. With mitigation measures, the impact assessments show there will be no significant adverse residual effects on marine mammals.

Mitigation measures have been committed to by the Project, such as the use of maximum hammer energies (6,600kJ for monopiles, 3,500kJ for pin-pile), soft start and ramp up procedures for piling, and a maximum of two piling events occurring simultaneously. Additionally, a MMMP for both piling and Unexploded Ordnance (UXO) clearance will be developed and implemented, the reduce the risk of auditory injury to negligible levels. A vessel management plan will also be developed, to reduce any collisions and minimise disturbance.

Offshore and Intertidal Ornithology

ES Chapter 12 (document reference 6.1.12) comprises the assessment of potential impacts of the Project on offshore and intertidal ornithology (seabirds).

The assessment focuses on the offshore infrastructure. The chosen area has been determined to best capture the potential impacts on Important Ornithological Features (IOFs) at the largest realistic area. A total of nine different bird species were identified, with the key species recorded in the greatest number being guillemot, gannet and kittiwake. On the beaches in the vicinity of the export cable landfall, species likely to be encountered include black-headed gull, common gull, herring gull and sanderling.

The Offshore ECC overlaps with the Greater Wash Special Area of Protection (SPA) which has offshore ornithological designations for breeding terns and overwintering red-throated diver and common scoter. There are a number of additional conservation sites of ornithological interest near to the project site including The Flamborough and Filey Coast SPA, The Wash SPA, Humber Estuary SPA, North Norfolk Coast SPA, Flamborough Head Site of Special Scientific Interest and Hornsea Mere.

During the construction phase, the assessment focused on potential disturbance to seabirds in both the Offshore ECC and the array area. The impact on species such as red-throated diver and common scoter was determined to be of minor significance, while effects on gannet, guillemot, razorbill, and puffin ranged from minor to moderate. Several mitigation measures have been committed to by the Project to reduce impacts on species that are sensitive to vessel disturbance, and with their implementation no significant adverse residual effects are expected.

During the operation and maintenance phase, the assessment addressed disturbance in the array area, collision risk, and indirect impacts on IOFs due to prey species habitat loss. Whilst impacts on gannet, red-throated diver, and other species have been evaluated, mitigation measures and changes to the Project design have been adopted and no significant adverse residual effects are expected.

The decommissioning phase was determined to result in similar impacts to the construction phase of the Project. Potential disturbance of species such as the red-throated diver and common scoter was assessed as of minor significance, while effects on gannet, guillemot, razorbill, and puffin ranged from minor to moderate. As with the construction phase, with mitigation measures in place it is anticipated that there will be no significant adverse residual effects.

Mitigation measures and changes to the Project design have been adopted by the Project to minimise impacts on IOFs, such as adapting the array footprint to avoid important seabird habitat and raising the minimum tip height of the blades to 40m relative to mean sea level (MSL). A number of other mitigation measures have been proposed by way of compensation strategies for kittiwake, guillemot and razorbill species.

Marine and Intertidal Archaeology

ES Chapter 13 (document reference 6.1.13) comprises the assessment of potential impacts of the Project on marine and intertidal archaeology.

Following surveys 15 wrecks or obstructions were identified within the array area and a further 15 within the Offshore ECC. Within the 1km buffer up to MHWS there are 26 records for wrecks, obstruction, foul ground and findspots. Within the Compensation areas (ANS areas and biogenic reef areas) there are 20 records for wrecks, obstruction and foul ground. Of these, the majority are dated as 20th century; there are also a number of obstructions which may have further archaeological interest. There are two post medieval obstructions noted within the array area and two roman obstructions on the export cable landfall. There is also the potential for the seabed to contain deposits of archaeological interest both within the array area and the Offshore ECC.

Several impacts were assessed during the construction phase. These included direct impacts, such as sediment removal containing undisturbed archaeological contexts, and penetration, compression, and disturbance from various construction activities. These impacts were deemed to have minor adverse impact, resulting in the conclusion that no significant adverse residual effects are expected.

Similarly, during the operation and maintenance phase, direct impacts from maintenance activities, jack-up barges and anchoring were assessed. Indirect impacts included disturbances to sediment and changes to the historic seascape character. The potential impacts being considered to have a minor adverse impact, leading to the conclusion that no significant adverse residual effects are expected during this phase.

The decommissioning phase involves potential direct impacts from decommissioning vessels and indirect impacts such as draw-down of sediment and changes to the historic seascape character. Moreover, these impacts were considered to have a minor adverse impact. Therefore, no significant adverse residual effects are expected during decommissioning.

In summary, the assessment suggests that throughout the construction, operation and maintenance and decommissioning phases, the identified impacts on marine and intertidal archaeology are of minor adverse significance, and no significant adverse residual effects are expected, with no additional mitigation measures identified.

The Project has committed to undertaking a Marine Written Scheme of Investigation which will be agreed with relevant parties and appropriate mitigation measures defined where necessary. Further mitigation measures include all intrusive activities undertaken during the life of the Project will be routed and microsited to avoid any identified Historic Environment receptors pre-construction, with Archaeological Exclusion Zones unless other mitigation is agreed with Historic England. Additional unknown or unexpected archaeological and cultural heritage receptors identified during the Project stages will be reported utilising the Project specific Protocol for Archaeological Discoveries. Additionally offshore geophysical surveys (including UXO surveys) and offshore geotechnical campaigns undertaken pre-construction will be subject to full archaeological review, where relevant, in consultation with Historic England. A post-construction monitoring plan will be developed.

Commercial Fisheries

ES Chapter 14 (document reference 6.1.14) comprises the assessment of potential impacts of the Project on commercial fisheries.

The Project lies within a wider region within which a variety of commercial fisheries operate. The value of landings in the wider region is dominated by shellfish species which account for 99% of all landings by value. Over 92% of all landings were by UK vessels and were caught by mostly pots and traps and dredges whilst other key species such as sandeel, plaice are targeted by beam trawl and otter trawl.

During the construction phase, the UK potting fishery and other fisheries such as trawlers will implement evidence-based mitigation measures aligned with Fishing Liaison with Offshore Wind and Wet Renewable (FLOWW) guidelines for the assessment of the potential impact of reduction in access to, or exclusion from established fishing grounds (array area). The procedures outlined in the Fisheries Liaison and Coexistence Plan are anticipated to be followed, aiming to prevent significant adverse residual effects. The array area has also been refined and a commitment has been made to a maximum of 50 per cent of foundations utilising a gravity base option.

During the construction phase potential impacts on the commercial fisheries were assessed. These included access or exclusion to fishing grounds, increased fishing pressures on other fishing grounds, increased vessel traffic associated with the Project interfering with the fishing activity and disturbance to commercially important fish and shellfish resources. Similarly for the assessment of the potential impact of During the construction phase, the UK potting fishery and other fisheries are expected to employ evidence-based mitigation in alignment with FLOWW guidelines. The Fisheries Liaison and Coexistence Plan procedures are anticipated to be followed, aiming for no significant adverse residual effects.

During operation and maintenance phase, impacts including reduction of access to fishing grounds, disturbance of commercially important fish and shellfish species, increased fishing pressure on adjacent grounds and increased vessel traffic through fishing grounds have been assessed. The project have included mitigation measures into the design, where applicable, such as agreeing marking and lighting with the Maritime and Coastguard Agency (MCA), Civil Aviation Authority (CAA) and Trinity House and ensuring the project is adequately marked on nautical charts. The use of safety zones around major maintenance works and the recovery of dropped objects that pose potential threat to other marine users. The Fisheries Liaison and Coexistence Plan procedures are anticipated to be followed, aiming for no significant adverse residual effects.

In the decommissioning phase, impacts are expected to mirror those of the construction phase with the magnitude of effect anticipated to be no greater and likely less than in the construction phase.

Mitigation measures such as safety zones, agreeing the lighting and marking with Trinity House, MCA, and CAA, guard vessels, circulation of relevant project information including via all usual means and charting, producing a Fisheries Liaison and Coexistence Plan and reporting of dropped objects have all been committed to by the Project.

Shipping and Navigation

ES Chapter 15 (document reference 6.1.15) comprises the assessment of potential impacts of the Project on shipping and navigation.

The Project is located near a number of major shipping routes with many passing through the array area. These are predominantly vessels transiting west to north-east between the Humber Estuary and the Baltic Sea, there are also routes running from southeast to northwest between northeast England and mainland European ports in the North Sea. Shipping density is at its highest in the north-western aspect of the Offshore ECC with many other vessels passing along the northern array area boundary.

During the construction phase, several potential impacts have been identified. Impacts have been assessed such as vessel displacement leading to effects on schedule and potential collision incidents, the potential and the restriction of Adverse Weather Routeing. These are deemed tolerable without significant EIA implications. Impacts including increased vessel-to-vessel collision risk, vessel to structure allision risk and reduction of emergency response provision, are also considered tolerable with no significant EIA consequences. Mitigation measures such as; safety zones, agreeing the lighting and marking with Trinity House, MCA, CAA, guard vessels, circulation of relevant project information and charting, will reduce all impacts to a tolerable level.

Similar impacts are considered during the operation and maintenance phase. Vessel displacement, Adverse Weather Routeing restrictions, increased vessel-to-vessel collision risk, vessel to structure allision risk, and reduction of emergency response provision are all assessed as tolerable with the mitigation measures applied. Additionally, the reduction of under keel clearance, and the increased anchor/gear interaction risk with subsea cables, will both be managed to maintain a broadly acceptable status.

In the decommissioning phase, the identified impacts will be addressed similarly to the construction and operation phase. Vessel displacement, adverse routeing restrictions, increased vessel-to-vessel collision risk, vessel to structure allision risk, and reduction of emergency response provision will be mitigated to ensure they are tolerable with no significant EIA implications.

Aviation, Radar, Military and Communication

ES Chapter 16 (document reference 6.1.16) comprises the assessment of potential impacts of the Project on aviation, radar, military and communication

The airspace above and adjacent to the array is used for both civil and military aircraft and lies within the London Flight Information Region for Air Traffic Control.

During the construction phase, the creation of an aviation obstacle environment and increased air traffic related to wind farm construction are both considered not to be significant.

During the operation and maintenance phase the creation of an aviation obstacle environment and increased air traffic related to windfarm activities are deemed not significant. A major significant impact is identified concerning specific Primary Surveillance Radar (PSR) systems when there is no mitigation considered. However, mitigation solutions for the impact in specific PSR systems will be agreed with National Air Traffic Services (NATS) and the Ministry of Defence (MOD), and will reduce the impact to not significant.

Throughout the decommissioning phase, the removal of the aviation obstacle environment is expected to result in no change, and increased air traffic related to decommissioning activities is considered not significant. The following mitigation measure is proposed, Aviation stakeholders will be made aware of the Project decommissioning via Notices to Airmen (NOTAMs) and obstacle details will be passed to the CAA at least eight weeks before decommissioning commences. No additional mitigation measures are identified, leading to an overall assessment of not significant impact during decommissioning.

In summary, the assessment suggests that the Project is not expected to have significant adverse effects on civil and military aviation and radar, except a major significant impact on specific PSR systems, for which mitigation solutions are to be discussed with NATS and MOD. Mitigation measures the project has committed to, in order to reduce impacts include adhering to all relevant CAA and MOD safety guidance, the Project providing appropriate Information, notifications and charting to aviation stakeholders, and marking and lighting of obstacles will be in accordance with Article 223, MCA (MGN 654) and MOD requirements.

Seascape Landscape and Visual Impact Assessment

ES Chapter 17 (document reference 6.1.17) comprises the assessment of potential impacts of the Project on seascape, landscape, and visual impact assessment (SLVIA) receptors. The potential impacts from the Project on SLVIA receptors are from the array area (WTGs and Offshore Platforms) and the ORCP within the ECC.

Other offshore windfarms are located within the Marine Character Area meaning that windfarms form a key characteristic of the current seascape character. Due to the distance of the offshore array from the coast, the development will be mostly not visible to those onshore and only present in the offshore environment.

The Project design has been developed to reduce the impact and design commitments have been made such as the ORCPs would be positioned a minimum of 12km from the closest part of the coastline. The Project will also follow all legal requirements with regards to shipping, navigation and aviation marking and lighting. Relevant industry guidance and advise will also be followed for marking and lighting of all offshore infrastructure, with the Project committing to minimising the light impacts as far as practicable to mitigate potential effects.

Regarding landscape receptors, a key consideration is the potential impact on the Donna Nook to Gibraltar Point Naturalistic Coast Landscape Character Area (LCA), a narrow strip of land along most of the Lincolnshire coastline. Although the ORCPs would be relatively prominent from parts of this LCA, especially the section closest to them, the baseline context, influenced by existing development and offshore wind farms, would limit the overall relative change in relation to the LCA. The more remote section of this LCA along the northeastern part of the Lincolnshire coastline would experience reduced relative prominence of the ORCPs due to their greater distance.

In terms of visual receptors, significant effects have been identified on the closest parts of underdeveloped sections of the coastline. Viewpoints are shown in document 6.2.17.. In these areas, the introduction of the ORCPs would contrast with the existing character of the coastline. However, such effects are localised to the closest section of the coastline to the ORCPs. At viewpoints along the coastline, the effect would diminish due to a combination of intervening distance and the context of the baseline-built environment, especially where the viewpoint is situated within a settlement.

The study area includes nationally designated landscape such as the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB) and Norfolk Coast AONB. The effects on landscape and visual receptors within the designated landscapes have been assessed and concluded as not significant as a result of the Project. Therefore, it is considered that the Project would not adversely affect the defined special qualities or statutory purposes of the Lincolnshire Worlds AONB or Norfolk Coast AONB designations.

Throughout the construction phase the impacts of the array area infrastructure and ORCP construction were assessed. There is the potential for significant effect during the construction phase on seascape, landscape and visual receptors primarily with the construction of the ORCP due to their proximity to parts of the Lincolnshire coastline. These effects are associated with the closest onshore landscape and visual receptors to the ORCPs

During the operational phase the Project infrastructure within the array area will not have significant effects. However, the ORCP are predicted to have significant impacts on the closest parts of undeveloped sections of the coastline.

Within the decommissioning phase the effects are expected to be no greater than the construction. Therefore, the array area infrastructure is predicted to have a significant effect, and the ORCP will have a potential significant effect.

Marine Infrastructure and Other Users

ES Chapter 18 (document reference 6.1.18) comprises the assessment of potential impacts of the Project on marine infrastructure and other users .

The Project lies in an area which includes current and potential future oil and gas activity. There are currently 17 oil and gas licence blocks that are within the study area. There are also hydrocarbon fields, other offshore windfarms, subsea cables, marine disposal sites and aggregate areas.

During the construction phase, two key effects were identified. Firstly, there is a minor adverse effect related to activity or access displacement associated with increased vessel movements and the use of safety zones. This impact is not considered significant in EIA terms. Similarly, direct disturbance and damage to existing assets and infrastructure from construction activities were deemed to be minor. As a result, the residual impacts during construction are not considered significant.

In the operation and maintenance phase, three effects were assessed. Minor adverse effect was attributed to activity or access displacement associated with increased vessel movements, direct disturbance and damage to existing assets and infrastructure, and disturbance to operations from the physical presence of infrastructure. However, the impacts during operation and maintenance are not considered significant in EIA terms.

The decommissioning phase involves two identified effects. Minor adverse significance is associated with activity or access displacement linked to increased vessel movements and the use of safety zones, as well as direct disturbance and damage to existing assets and infrastructure. Similar to the construction, operation and maintenance phases, no additional mitigation measures were identified, resulting in the conclusion that the residual impact during decommissioning are not considered significant.

Mitigation measures have been proposed to minimise the potential impacts on other marine users. These include initial avoidance through site selection, lighting and marking in agreement with Trinity House, a Vessel Management Plan, a Cable Specification and Installation Plan, circulation of relevant project information, and safety zones being applied for around construction and maintenance works.

In summary, the assessment indicates that throughout the construction, operation and maintenance, and decommissioning phases, the identified effects on marine infrastructure and other users are of minor adverse significance, and no significant effects are expected

Summary of Onshore EIA Topics

This section summarises the results of the ES for each of the onshore EIA topics assessed. A guide to these topic chapters, including all associated ES documents and supporting submissions are included in Appendix 1.

Air Quality

ES Chapter 19 (document reference 6.1.19) comprises the assessment of potential impacts of the Project on air quality receptors.

During the construction phase, the assessment focussed on potential impacts from dust, Non-Road Mobile Machinery (NRMM), and offshore vessel emissions. Results indicate negligible to minor adverse effects, all considered to be non-significant in accordance with the EIA regulations. Specific mitigation measures were outlined for dust and NRMM, contributing to the overall not significant conclusion. Temporary increases in traffic, a consequence of construction activities, were also evaluated, with the study determining these effects on human and ecological receptors to be temporary and non-significant. Traffic associated with both future planned developments and live projects and plans were considered in the assessment, which resulted in cumulative impacts being assessed.

In relation to the operations and maintenance phase, a screening of road traffic impacts concluded that anticipated changes to the volume of traffic is below the relevant screening criteria, rendering further assessment unnecessary, as acknowledged through the received Scoping opinion. This phase was thus considered to have negligible and non-significant effects on onshore air quality.

For decommissioning activities, these are not anticipated to exceed the MDS criteria established for the construction phase. Given that the effects associated with the construction phase are considered not significant, no additional assessment of the decommissioning phase is necessary, however a decommissioning plan will be developed in due course.

There are a number of commitments made by the Project to minimise and reduce the impacts to air quality including adhering to best practice construction measures in relation to dust and NRMM, and development and adherence to the Code of Construction Practice (CoCP), Construction Traffic Management Plan (CTMP), Travel Plan and Outline Public Access Management Plan (PAMP).

Overall, the determined air quality effects associated with each assessment and phase of the Project are considered to be not significant levels in terms of the EIA regulations.

Onshore Archaeology and Cultural Heritage

ES Chapter 20 (document reference 6.1.20) comprises the assessment of potential impacts of the Project on onshore archaeology and cultural heritage receptors.

A review of heritage assets has identified known and anticipated archaeological remains within the Order Limits which may be susceptible to direct impacts. It has also identified built heritage receptors within the vicinity of the Order Limits which may be sensitive to setting change.

The assessment of archaeological potential was aided by deposit modelling and field evaluation comprising a watching brief of site investigations and geophysical survey.

The assessment of potential impact to heritage assets through setting change was aided by field observations and computer-generated output from the landscape and visual impact assessment (LVIA).

The baseline presented has allowed an adequate understanding of the potential impact of the proposed development upon archaeological remains and built heritage receptors.

The likelihood of archaeological remains will be variable due to the historic geography of the Order Limits and the Project provides for flexibility around preservation of any remains that may be uncovered in situ along the entire onshore ECC.

No designated archaeological remains would be physically affected by the Project. The potential impact to non-designated remains of potential equivalence to a Scheduled Monument has been avoided in respect to Slackholme deserted medieval village (HER MLI99418), near Hogsthorpe. This would be avoided through the use of trenchless techniques.

No significant impacts to non-designated archaeological remains are predicted where preservation in situ is not possible, namely the location of the OnSS and the location of the TJB at landfall.

In all instances, where significant impacts to non-designated remains are possible along the onshore ECC, the implementation of design measures at the detailed design stage to reference trenchless techniques, micrositing and no-dig measures would remove significant impacts.

On this basis there would be no residual significant effects to non-designated archaeological remains.

With regard to setting change and how this may affect heritage assets, no potentially significant indirect impacts have been identified for designated heritage assets or non-designated heritage assets. All indirect impacts are identified as insignificant and predominantly temporary or short term.

All effects should be balanced by the public benefits around the electricity supply that the Project offers. Public benefits could also be achieved through the release of heritage capital that any archaeological fieldwork would trigger.

Onshore Ecology

ES Chapter 21 (document reference 6.1.21) comprises the assessment of potential impacts of the Project on onshore ecological receptors.

The ecological study area spans internationally designated sites, nationally designated sites and local reserves surrounding the Order Limits. The study area includes areas within 15km of the Project's Order Limits for Special Areas of Conservation (SAC), Ramsar Sites, Sites of Special Scientific Interest (SSSI), and National Nature Reserves. It extends to 2km for onshore elements of Local Nature Reserves, Local Wildlife Sites, and Lincolnshire Wildlife Trust Reserves and protected and notable species records and 5km for records of roosting bats.

Surveys have been undertaken to characterise the ecology of the area and include those for habitats, badger, bats, water vole, otter, great crested newt, reptiles and invertebrates. The presence of invasive, non-native species has also been considered.

The assessment focuses on a range receptors arranged from those of least local importance, to those subject to nature conservation and / or legal protection. The impacts considered are those relating to construction, operations and maintenance and decommissioning of the Project. Principally they include indirect impacts on designated sites, the permanent and temporary loss or damage of habitats, impacts on protected and priority species and the spread of invasive species.

The project expects to have five impacts during construction including indirect impacts on designated sites; potential loss of habitats, temporary loss or damage to priority habitats, impacts to protected and priority species and spread of invasive non-native species (INNs) one during operations and maintenance; disturbance of protected and priority species and one additional impact during decommissioning; impacts similar to construction but more limited in geographical extent and timescale.

The Project has made a number of commitments to reduce impacts on onshore ecological receptors. Most notably, the adoption of trenchless techniques at 216 separate sites along the onshore ECC and 400kV cable corridor to avoid impacts to major river and watercourses, priority habitats and designated sites. The Project has also been designed to avoid all ponds and woodland and reduce the need for severance of linear habitat features as much as possible. An Outline Landscape and Ecology Management Strategy (OLEMS) has been produced which presents the mitigation measures that will be undertaken to manage the potential impacts to onshore ecological receptors. With measures in place the project will result in no significant effect for any of the impacts.

Onshore Ornithology

ES Chapter 22 (document reference 6.1.22) comprises the full assessment of potential impacts of the Project on ornithological (bird) receptors.

The ornithological study area spans internationally designated sites, nationally designated sites and local reserves. The study area includes areas within 15km of the Project for Special Protected Areas (SPA), Ramsar Sites, and Sites of Special Scientific Interest (SSSI), and within 2km for onshore elements of Local Nature Reserves, Local Wildlife Sites, Royal Society for the Protection of Birds (RSPB) Reserves, and Lincolnshire Wildlife Trust Reserves. Bird surveys cover the onshore Order Limits plus a minimum 400 buffer for non-breeding bird surveys and a 100m buffer for breeding bird surveys.

Habitat loss, is considered temporary, affecting specific arable fields, and mitigation measures, such as avoiding breeding territories, are in place to prevent adverse effects. The construction phase assessment integrates targeted measures to keep impacts on bird species minimal, temporary, and localised, ensuring the protection of the local avian ecosystems.

Within the operational and maintenance phase, there is one impact which is limited to disturbance during planned and unplanned maintenance works. However, activities are expected to be highly localised within the substation, with minimal disturbance to adjacent areas.

For decommissioning, there is one impact which would be similar to the construction phase but more limited in geographical extent and timescale. The cables are to be left in situ, and no permanent habitat loss is expected. Short-term, localised, and temporary adverse effects are to be mitigated, ensuring no significant long-term impact on bird species.

Potential harm to birds, is mitigated through a Construction Method Statement (CMS) and pre-works surveys, ensuring protection for nesting birds and preventing significant harm. Disturbance to protected bird species, is mitigated through seasonal restrictions and localised working commitments to minimise disruption to specific bid populations. Water and air quality are both managed through detailed assessments and embedded mitigation measures in the Pollution Prevention Emergency Incident Response Plan (PPEIRP) and Air Quality Management Plan (AQMP).

In summary, the proposed project incorporates various mitigation measures during construction, operation, maintenance and decommissioning phases, aiming to minimise impacts on bird species and their habitats, ensuring overall temporary minor effects on the local avian ecosystems.

Geology and Ground Conditions

ES Chapter 23 (document reference 6.1.23) comprises the assessment of potential impacts of the Project on geology and ground condition receptors.

The geology underlying the Project is made up of a range of intertidal deposits including peats, saltmarsh deposits and shelly clays lying on a bedrock of chalk. The Project is not located in a coal mining area, and there is no significant coal-bearing rock present. There are no records of active quarries in the area, or any modern brickworks and the area does not fall within the Lincolnshire minerals safeguarding area.

The majority of the onshore ECC and OnSS are located on agricultural land. The mapped quality of the agricultural land across the Study Area varies from Agricultural Land Classification (ALC) Grade 1-3. Grade 3 land is described as good to moderate quality with Grade 1 and 2, described as good to excellent quality.

The study area involves potential receptors, including soils, geology and construction workers, who may be exposed to ground contamination. These receptors vary in environmental sensitivity from negligible to major. The assessment impacts of the project on geology and ground conditions range from minor to negligible adverse effects.

During the construction phase, short-term risks to construction workers are considered minor adverse with no significant residual effects due to the implementation of the Code of Construction Practice (CoCP). Risk to offsite human receptors and construction phase impacts on soil/land quality are minor adverse with no significant residual effects. Minor adverse impacts on geology and soils from the onshore ECC, OnSS, Trenchless Crossing, and TJB are noted with no significant residual effects. The CoCP and PPEIRP and Soil Management Plan (SMP), integrated into the Project, proves instrumental in mitigating these impacts.

There is no potential for sterilisation of safeguarded mineral deposits and therefore there the Project has a negligible impact with no significant effects. Designated Sites and agricultural drainage both have minor adverse impacts with no significant residual effects. The SMP submitted as a part of the DCO application which will include measures to control potential impacts to agricultural drainage.

Moving to the operation and maintenance phase, the infiltration and build-up of hazardous ground gases are negligible with no significant residual effects. Structures and services laid in direct contact with contaminated soils and groundwater have a negligible impact with no significant residual effects. Operational impacts on geology/ground conditions and associated longer-term risks are negligible with no significant residual effects. Agricultural Drainage has a minor adverse impact with no significant residual effects.

During the decommissioning phase, risks to offsite human receptors are considered minor adverse with no significant residual effects. In summary, the overall assessment indicates that the project's impacts on geology and ground conditions are mitigated to a level where no significant adverse residual effects are expected during construction, operation, and decommissioning, according to EIA terms.

The Project has made a number of commitments to minimising and reducing the impacts on geology and ground conditions including careful cable routing to avoid where possible any sensitive areas. A CoCP, PPEIRP and SMP have been submitted as a part of the DCO application which will include measures to control potential impacts to ground conditions. By incorporating these commitments no significant effects have been identified in relation to geology and ground conditions.

Through the implementation of mitigation measures, including those specified in the CoCP, it is concluded that the overall effect of the Project on geology and ground conditions during construction, operation, and decommissioning is not significant in EIA terms.

Hydrology, Hydrogeology and Flood Risk

ES Chapter 24 (document reference 6.1.24) comprises the assessment of potential impacts of the Project on hydrology, hydrogeology, and flood risk receptors.

The onshore study area for hydrology, hydrogeology and flood risk is defined by a 2 km buffer around the Order Limits.

There are a number of watercourses (rivers, streams, coastal waters) which are monitored under the Water Framework Directive with moderate ecological status, which means the quality of the watercourses and their ability to support a functional ecosystem of animals and plant life, is of a medium level. Coastal waters form part of the Greater Wash Special Protection Area which has bathing water of excellent quality at the coastline.

The assessment of the Project reveals a lack of understanding of the potential impacts on various hydrological receptors in the study area, ranging from tidal and fluvial floodplains to watercourses, groundwater, and near-shore tidal waters of the North Sea. The environmental sensitivity of these receptors varies from low to high.

During the construction phase, the project tries to minimise its environmental impact on hydrological receptors in the study area. Impacts on watercourses, near-shore coastal waters, transitional water bodies, groundwater quality, and flood risk range from minor (adverse) to negligible. The CoCP and PPEIRP, integrated into the Project, is vital in mitigating these impacts, and ensures compliance with EIA Regulations.

In the operation and maintenance phase, the project continues its commitment to environmental stewardship. There are Minor (adverse) to negligible impacts on various environmental receptors, and the Flood Risk Assessment (FRA) assists in managing these effects.

The decommissioning phase of the project has impacts no worse than construction. Whether decommissioning the onshore ECC or OnSS, the project maintains a minor (adverse) to negligible impact on environmental receptors. The CoCP and FRA, integral to the project, guide the decommissioning process, ensuring that environmental considerations remain at the forefront.

The Project has made a number of commitments to minimise and reduce the risk to hydrology, hydrogeology and flood risk including obtaining consent for any intrusive works, careful routing to avoid any key areas of sensitivity, detailed surface water drainage plans, preparation of a Flood Response Plan and adherence to the PPEIRP. By incorporating these commitments no significant effects have been identified in relation to hydrology, hydrogeology and flood risk.

Land Use

ES Chapter 25 (document reference 6.1.25) comprises the assessment of potential impacts of the Project on land use receptors.

The majority of the onshore ECC and OnSS are located on agricultural land, with the quality of the agricultural land being determined using the Agricultural Land Classifications (ALC), which provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system. The Order Limits are also frequently crossed by Public Rights of Way (PRoWs), utilities, ecological designations, agri-environmental schemes and various outdoor areas of land with potential recreational purposes, such as a Country Park or Common Land.

The quality of the agricultural land across the Study Area varies from ALC grade 1-3. Current ALC maps do not differentiate Grade 3 between Grade 3a and Grade 3b. A worst-case scenario was used in the assessment, assuming that all Grade 3 has the potential to be Grade 3a, therefore Best and Most Versatile (BMV) soils.

During the construction phase, 10 potential impacts have been identified, however, there are no significant residual effects associated with land use when accounting for the embedded measures of mitigation, such as the CoCP, SMP, and Public Access Management Plan (PAMP) (document reference 8.1.7). Minor adverse effects on agricultural productivity and land holdings were identified, but no significant adverse residual effects were observed, through a combination of the temporary and phased nature of the impacts, as well as the integration of management plans which proved instrumental in mitigating these impacts.

Additionally, impacts on outdoor recreational land, ecological designations, long-distance routes, agri-environmental schemes, utilities, access/common land, greenspace, and coastal use were either negligible or minor adverse, with no significant adverse residual effects, particularly with regards to the several receptors where impacts are entirely avoided through the Project's design and bypassing beneath the receptor through the usage of trenchless techniques.

During the operation and maintenance phase, two impacts have been identified, one is not significant, however, one effect concerning the permanent loss of local agricultural land as a result of the OnSS, link boxes, and associated ancillary infrastructure is of residual major adverse effect after mitigation.

The decommissioning phase was considered to mirror the impacts during the construction phase, albeit with the cables being proposed to remain underground, therefore, no impact as they are not removed. The removal of the permanent infrastructure was considered to be a minor adverse effect, which is not significant in EIA terms. This phase is characterised by a relatively low level of impact on land use compared to the construction phase through less intrusive techniques for the removal of the Project, comparatively with the construction of the Project.

In summary, the assessment indicates that the Project's construction phase has minimal adverse effects on land use. However, during the operation and maintenance phase, the permanent loss of agricultural land has significant adverse effects, for which no mitigation measures have been identified. The decommissioning phase shows minor impacts. Cumulatively, the Project continues to contribute to a major adverse impact on the loss of arable agricultural land but is noted of being of a minor scale within the context of other developments within the county.

Noise and Vibration

ES Chapter 26 (document reference 6.1.26) comprises the assessment of potential impacts of the Project on noise and vibration receptors.

During construction, including landfall, onshore ECC and OnSS activities, temporary minor to major adverse noise and vibration effects are anticipated. The mitigation measures outlined in the detailed design, the implementation of a noise and vibration management plan and set construction hours will aim to address the impacts and minimise the potential for noise and vibration impacts as far as reasonably practicable so, at worst, temporary minor adverse are experienced at the identified receptors which are non-significant in terms of the EIA Regulations.

Operational noise levels from the OnSS may result in permanent moderate adverse effects on residential receptors. However, the implementation of measures such as acoustic enclosures, silencers, and covers is expected to mitigate these impacts to minor adverse which are non-significant in terms of the EIA Regulations. Operational noise effects on ecological receptors are projected to be minor and manageable.

During the decommissioning phase, anticipated noise and vibration levels during decommissioning activities are not expected to surpass worst-case criteria established during the construction phase, assuming no night-time or pilling decommissioning operations are required.

The Project has made a number of commitments to reduce and minimise impacts from noise and vibration on human and ecological receptors including using minor drills wherever possible, avoiding areas of key sensitivity and ensuring work is carried out in accordance with a detailed Noise and Vibration Management Plan. Following the incorporation of such commitments no significant effects have been identified in relation to noise and vibration.

Traffic and Transport

ES Chapter 27 (document reference 6.1.27) comprises the assessment of potential impacts of the Project on traffic and transport receptors.

The traffic assessment considered the potential impacts associated with an increase in construction traffic and potential disruption to the National Railway where construction vehicles may cross the railway line. The assessment considers construction and decommissioning impacts as once the Project has been constructed there would be no significant levels of traffic movements, based on The Planning Inspectorate's Scoping Opinion (September 2022). This approach was subsequently presented and agreed upon through the ETG process.

A quantitative and qualitative assessment of potential traffic and transport effects associated with worst-case construction activities was conducted using methods outlined in Guidelines on the Environmental Assessment of Traffic and Movement[9] (GEATM), Design Manual for Roads and Bridges[10] (DMRB), and professional judgment.

The peak hour and daily vehicle movements were calculated using the construction programme and information from the local highway network regarding the number of vehicles required to facilitate this., The vehicle movement numbers were shown on all highway links in the study area, which covers core and local construction vehicle access routes.

Based on the number of the Project construction vehicles forecast in the peak hours on the highway network in the study area, a formal assessment of impacts on the division of space and people by transport and traffic delay was scoped out.

The implications of temporary lane or road closures associated with open trenching were evaluated in terms of driver severance and delay. The assessment found no significant effects outside of the summer months, except for Marsh Road, where a short-term closure would require careful planning and communication to the public but results in negligible residual effects.

Following the screening assessment using Rules 1 and 2 in GEATM, 40 highway links necessitated full assessment under EIA regulations for the impacts of increased daily construction vehicle movements associated with the Project. The outcome of the assessment revealed no significant effects on community severance, vulnerable road users and road safety, pedestrian amenity and from dust and dirt.

The study area's users of Public Rights of Way (PRoW) impacted by the Project's construction were assessed, identifying significant effects on specific PRoW during summer as a worst case scenario and due to shared routes with construction traffic.

9. https://www.iema.net/resources/blog/2023/07/12/new-iema-guidance-environmental-assessment-of-traffic-and-movement

10. https://www.standardsforhighways.co.uk/dmrb

The Project has made a number of commitments to reduce and minimise impacts from traffic and transport including the implementation of a Construction Traffic Management Plan, a Travel Plan (specific to the workforce) and a Public Access Management Plan (PAMP). The implementation of the final PAMP will incorporate measures agreed upon with relevant authorities to minimise impacts by minimising the length and duration of any temporary diversion and providing warning signage and segregation (where feasible) for users on shared routes. These measures would further reduce the level of effect and not be considered significant.

Additional commitments to mitigate impacts include the use of trenchless techniques (such as horizontal direction drilling) for the installation of the export cable under a number of roads, including the main 'A' roads in the study area, which would not require a temporary road or lane closure. The Project has further identified a number of highway improvements such as new passing places and other widening on the local construction vehicle access routes to facilitate the required construction vehicles.

Following the incorporation of such commitments no significant effects have been identified in relation to traffic and transport.

Landscape and Visual Assessment

ES Chapter 21 (document reference 6.1.21) comprises the assessment of potential impacts on landscape and visual receptors that will arise as a result of the construction and operational phases of the onshore components of the Project.

The assessment explored the potential impacts of the onshore components of the Project on the existing landscape resources within the onshore study area and the visual experience of its observers. It considered the physical impacts of the landfall, onshore ECC, 400kV cable corridor, and OnSS on the landscape during construction. It also assessed the landscape character effects during the construction and operation of the OnSS, as well as the visual effects during the construction of the landfall, onshore ECC, and 400kV cable corridor, and during the construction and operation of the OnSS.

In the construction phase, most physical elements at the landfall and along the OnSS will not be significantly affected, there will be localised significant effects where trees and hedgerows are removed for access to the onshore ECC, however, this is mitigated against by additional planting.

There will be significant effects on the local landscape character around the OnSS during the construction phase, extending up to a maximum range of 1.6km, due to the presence and influence of the construction works and the emerging OnSS. Similar significant effects will persist during the operational phase but will gradually diminish over a 15-year period due to the growth of a comprehensive onsite and offsite planting scheme proposal around the OnSS. The onshore programme for decommissioning is expected to be similar to that of the construction phase.

During the construction phase, visual amenity will be significantly affected for people in the local area around the OnSS, extending up to a maximum range of 1.3km due to the presence and influence of construction works and the emerging OnSS. Similar significant effects will persist during the operational phase but will gradually diminish over a 5 to 15-year period owing to the growth of a comprehensive onsite and offsite planting scheme proposal around the OnSS.

Significant cumulative effects will occur on local residents and road-users during the construction of the 400kV cable corridor and the NGSS. There will also be significant cumulative effects during the construction and operational phases on three representative viewpoints owing to the cumulative interaction between the OnSS and the ADP, and on two viewpoints owing to the cumulative interaction between the OnSS, application stage ADP and the NGSS. All significant effects will be reduced to not significant during a 5 to 15 year period during which mitigation planting will grow to create an effective screen around the OnSS.

The Project has made a number of commitments to reduce and minimise the impacts to the landscape and visual receptors through the design, development and site selection process which considered the constraints associated with the current landscape features, development and adherence to the CoCP which include measures to reduce temporary disturbance and incorporation of good practice measures. An outline Landscape and Ecological Management Strategy (document reference 8.10) has been submitted as part of the application which sets out the landscape and ecological elements of the Project.

Summary of Wider Project EIA Topics

This section summarises the results of the ES for each of the wider EIA Project topics assessed. A guide to these topic chapters, including all associated ES documents and supporting submissions are included in Appendix 1.

Socio-economic Characteristics

ES Chapter 21 (document reference 6.1.21) comprises the assessment of potential impacts of the Project on socio-economic, tourism and recreation receptors.

During the construction phase of the Project, the assessment found that there will be a minor beneficial impact, on the economy of the LEA. These effects are specifically noted in terms of economic activity and employment in the local area, with mitigation measures such as proactively engaging local economic development stakeholders, supporting tier 1 contractors and engaging early with education and training providers to identify skills gaps considered. The residual impact is determined to be minor which is not significant in all aspects.

The operational and maintenance phase assessment anticipates similar minor non-significant beneficial effects on the economy of the LEA, encompassing economic activity and employment. The impact was assessed as negligible for the wider regional and national economic activities, reinforcing the overall minor nature of the effect during this phase. Tourism economy and assets, as well as recreational use of the Macmillan Way, are expected to experience minor impacts, with corresponding mitigation measures considered

In the decommissioning phase, the assessment reiterates the projection of minor and not significant effects on the economy of the LEA, both in terms of economic activity and employment. These effects extend to the regional and national economic activities, where the impact is determined to be negligible. Social and community assets are expected to experience negligible impacts during decommissioning, emphasizing the minimal significance of the projected effects on the local community and broader region.

Human Health

ES Chapter 30 (document reference 6.1.30) comprises the assessment of potential impacts of the Project on human health receptors.

The Chapter brings together the relevant information on health, including assessing the findings of other chapters within this ES in terms of population health. The potential impacts on human health from the Project originates from construction and associated traffic, which could lead to heightened noised levels, dust, and emissions. The study indicates that a combination of planned mitigation measures discussed in this chapter and additional steps outlined in the technical chapters can effectively manage these issues, maintaining them at levels considered not significant in terms of EIA.

Assessments of potential health effects during both construction and operation phases, concluded that there won't be significant impacts on human health as a result of the Project. The assessment has considered factors such as changes in noise, air quality, ground or water contamination, physical activity, access to health services, employment, and perception of risk.

The study categorizes various potential effects during construction and operation based on factors such as temporal scope, probability, sensitivity of the population, and magnitude of effect. For example, during construction, while there may be plausible short-term effects on noise, air quality, and physical activity, the overall significance of these effects on the general population is considered negligible or minor adverse. Furthermore, during both the construction and operation phases, the study predicts that long-term noise effects will have no significant impact.

The decommissioning phase is expected to have health effects similar in scale and nature to those during construction. This comprehensive assessment assures that the Project is mindful of potential health impacts, taking measures to mitigate them and ensuring the well-being of the surrounding population.

The Project has made a number of commitments during the construction and operational phases of the project to reduce and minimise the impacts to human health which are secured through the CoCP, NVMP, AQMP, and the onshore archaeological WSI.

Climate Change

ES Chapter 31 (document reference 6.1.31) comprises the assessment of potential impacts of the Project on climate change receptors.

The climate change assessment for the Project involved a thorough analysis of its environmental impact throughout the entire life cycle. This included evaluating the carbon footprint associated with everything from manufacturing the raw materials for construction to the eventual recycling or disposal at the end of its 35-year lifespan, alongside the benefit produced from the renewable electricity generated.

The estimated greenhouse gas emissions for the operation phase are 5.3 million metric tons of CO2 equivalent. This calculation considered a combination of jacket/pile and Gravity-Based Structure (GBS) foundations. The Project aims to generate 7,227GWh (gigawatt-hours) of electricity annually, resulting in a relatively low carbon intensity of about 20.8 grams of CO2 equivalent per kilowatt-hour (kWh).

Comparing this to alternative electricity generation methods like gas Combined Cycle Gas Turbine (CCGT) (with carbon intensity of 371g CO2eq/kWh), the Project is expected to offset its construction-related emission in approximately two years. This highlights the Project's environmental benefits, showing that it efficiently manages and minimises its carbon impact.

The project will, wherever it is realistically able to, use recycled materials for the project. Upon decommissioning the project will minimise the amount of materials sent to landfill and will recycle wherever possible materials which are no longer needed.

Cumulative Effects Assessment

The EIA included a cumulative effects assessment, undertaken in terms of the approach set out in PINS Advice Note 17 regarding Cumulative Effects Assessment (August 2019) with project-specific considerations. The details of the approach are presented in Appendix 32.1 (document reference 6.3.32.1).

Cumulative effects are the combined effect of the Project acting additively with the effects of other developments, on the same single receptor/resource.

Given the scale and nature of the Project's construction activities and the limited operational effects, the CEA is focussed on the assessment of cumulative effects with other developments whose construction periods will coincide with the Project's construction timeline.

Consideration was given to potential cumulative effects during the Project's operations phase for other developments in proximity to the OnSS.

It is anticipated that cumulative effects during the decommissioning phase of the project will be similar to that experienced during the construction phase.

Other developments which could potentially interact with the Project, were identified from relevant local planning authority application portals and subject to review and screening. 15 other developments were scoped into the CEA for particular environmental aspects.

Where projects were existing, these have been assessed as part of the baseline environment. No significant effects were assessed for cumulative impacts from the Project and nearby projects across all topics.

Summary

Offshore there will be up to 100 WTG's, four offshore substations, array and interlink cables, two ORCPs, four offshore export cable circuits and two ANS's and biogenic reef compensation areas.

Onshore there will be up to four export cable circuits over a 70 km ECC and one OnSS.

All effects for offshore activities, which have not been compensated for have either minor or negligible residual effects, except SLVIA where the ORCPs are of significant effect. Overall, the benefit of the project outweighs the significance of the ORCP effect.

All effects for onshore activities are of minor or negligible effect over the lifetime of the project except for land use which has a significant effect in relation to the loss of agricultural land limited to the effect of the OnSS

Outer Dowsing Offshore Wind will bring value to the UK:

1. Reduce greenhouse gas emissions, in line with the UK Government's strategy to reach net zero emissions across the economy by 2050 and meet its statutory target for a 100% reduction over 1990 emission levels by the same date;
2. Bolster national energy security by reducing reliance on imported fossil fuels
3. Produce affordable energy and reduce exposure to volatile global wholesale energy prices
4. Help achieve the UK's commitment to climate change by boosting the UK's capacity to generate low-carbon power by delivering 40GW of electricity by 2030
5. Invest in UK energy infrastructure and supply chain while also creating long-term skilled jobs

Appendix 1: Application Document List

1 Introductory Materials

1.1	Cover Letter
1.2	Guide to the Application
1.3	Draft Section 55 Checklist
1.4	Application Form

2 Plans and Drawings

2.1	Works Plans Onshore
2.2	Works Plans Offshore
2.3	Location Plan Onshore
2.4	Location Plan Offshore
2.5	Land Plans
2.6	Crown Land Plans Onshore
2.7	Crown Land Plans Offshore
2.8	Offshore Order Limits and Grid Coordinates Plan
2.9	Access to Works Plan
2.10	Public Rights of Way Plan
2.11	Streets Plan
2.12	Special Category Land Onshore
2.13	Historic Environment Plan Onshore
2.14	Historic Environment Plan Offshore
2.15	Statutory and Non-Statutory Nature Conservation Sites Onshore
2.16	Statutory and Non-Statutory Nature Conservation Sites Offshore
2.17	Important Hedgerows and Tree Preservation Order Plan
2.18	Onshore Crossing Plans
2.19	Offshore Crossing Plans
2.20	Traffic Regulation Order Plan

3 Draft Development Consent Order and Supporting Documents

3.1	Development Consent Order
3.2	Explanatory Memorandum
3.3	Other Consents and Licences

4 Compulsory Acquisition Information

4.1	Book of Reference
4.2	Compulsory Acquisition Funding Statement
4.3	Statement of Reasons

5 Consultation Report

5.1	Consultation Report

6 Environmental Statement

6.1	Non-Technical Summary
6.1.1	Chapter 1 Introduction
6.2.1	Chapter 1 Introduction Figures
6.3.1	Chapter 1 Introduction Appendices
6.1.2	Chapter 2 Need, Policy and Legislative Context
6.2.2	Chapter 2 Need, Policy and Legislative Context Figures
6.3.1	Chapter 2 Need, Policy and Legislative Context Appendices
6.1.3	Chapter 3 Project Description
6.2.3	Chapter 3 Project Description Figures
6.3.3.1	Chapter 3 Appendix 1 Cable Burial Risk Assessment [Confidential]
6.3.3.2	Chapter 3 Appendix 2 Onshore Crossing Schedule
6.3.3.3	Chapter 3 Appendix 3 Offshore Crossing Schedule
6.1.4	Chapter 4 Site Selection and Consideration of Alternatives
6.2.4	Chapter 4 Site Selection and Consideration of Alternatives
6.3.4.1	Chapter 4 Appendix 1 Landfall Assessment & Offshore ECC Route Optioneering
6.1.5	Chapter 5 EIA Methodology
6.2.5	Chapter 5 EIA Methodology Figures
6.3.5.1	Chapter 5 Appendix 1 Statement of Competence
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6.1.6	Chapter 6 Technical Consultation
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6.3.6.1	Chapter 6 Appendix 1 Evidence Plan Process Consultation
6.1.7	Chapter 7 Marine Physical Processes
6.2.7	Chapter 7 Marine Physical Processes Figures
6.3.7.1	Chapter 7 Appendix 1 Physical Processes Technical Baseline
6.3.7.2	Chapter 7 Appendix 2 Physical Processes Modelling Report
6.3.7.3	Chapter 7 Appendix 3 Seabed Mobility Report [Confidential]
6.1.8	Chapter 8 Marine Water and Sediment Quality
6.2.8	Chapter 8 Marine Water and Sediment Quality Figures
6.3.8.1	Chapter 8 Appendix 1 Water Framework Directive
6.1.9	Chapter 9 Benthic and Intertidal Ecology
6.2.9	Chapter 9 Benthic and Intertidal Ecology Figures
6.3.9.1	Chapter 9 Appendix 1 Benthic Ecology Technical Report (Array)
6.3.9.2	Chapter 9 Appendix 2 Benthic Ecology Technical Report (ECC)
6.3.9.3	Chapter 9 Appendix 3 Intertidal Technical Report
6.3.9.4	Chapter 9 Appendix 4 Marine Conservation Zone Assessment
6.3.9.5	Chapter 9 Appendix 5 Envision Data Analysis
6.1.10	Chapter 10 Fish and Shellfish Ecology
6.2.10	Chapter 10 Fish and Shellfish Ecology Figures
6.3.10.1	Chapter 10 Appendix 1 Fish and Shellfish Ecology Technical Baseline
6.1.11	Chapter 11 Marine Mammals
6.2.11	Chapter 11 Marine Mammals Figures
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6.1.12	Chapter 12 Offshore and Intertidal Ornithology
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7 RIAA, HRA Screening, Derogation and Compensation

7.1	Report to Inform Appropriate Assessment
7.1	Report to Inform Appropriate Assessment [Confidential]
7.1.1	Offshore and Intertidal Ornithology Apportioning
7.1.2	Ornithology Population Viability Analysis (Habitats Regulations Assessment)
7.2	HRA Screening Report
7.3	Screening Matrices
7.4	Integrity Matrices
7.5	Derogation Case
7.6	Benthic Without Prejudice Compensation Strategy
7.6.1	Sandbank Compensation Plan
7.6.1.1	Sandbank Compensation Implementation and Monitoring Plan
7.6.2	Biogenic Reef Compensation Plan
7.6.2.1	Biogenic Reef Compensation Implementation and Monitoring Plan
7.6.3	Benthic Compensation Evidence Base and Roadmap
7.7	Ornithology Compensation Strategy
7.7.1	Kittiwake Compensation Plan
7.7.1.1	Kittiwake Compensation Implementation and Monitoring Plan
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7.7.2.1	Guillemot Compensation Implementation and Monitoring Plan
7.7.3	Razorbill Compensation Plan
7.7.3.1	Razorbill Compensation Implementation and Monitoring Plan
7.7.4	Artificial Nesting Structure Evidence & Road Map
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7.7.5.1	Plémont Seabird Reserve Feasibility Study Report
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7.8	The Crown Estate Kittiwake Strategic Compensation Plan
7.8.1	App A TCE Kittiwake Strategic Implementation Monitoring Plan
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7.9	Compensation Funding Statement

Outline Documents

8.1	Outline Code of Construction Practice
8.1.1	Outline Noise and Vibration Management Plan
8.1.2	Outline Air quality management plan
8.1.3	Outline Soil Management plan
8.1.4	Outline Pollution Prevention and Emergency Incident Response Plan
8.1.5	Outline Surface Water Drainage Strategy
8.2	Outline Offshore Operations and Maintenance Plan
8.3	In Principle Monitoring Plan
8.4	Outline Project Environmental Management Plan
8.5	Outline Cable Specification and Installation Plan
8.6.1	Outline Marine Mammal Mitigation Protocol (Piling)
8.6.2	Outline Marine Mammal Mitigation Protocol (UXO)
8.7	In Principle Southern North Sea Special Area of Conservation Site Integrity Plan
8.8	Outline Marine Archaeological WSI
8.9	Outline Onshore Archaeology WSI
8.10	Outline Landscape and Ecological Management Strategy (OLEMS)
8.11	Outline Operational Artificial Light Emissions Management Plan
8.12	Outline Operational Drainage Management Plan
8.13	Schedule of Mitigation
8.14	Outline Fisheries Liaison and Co-existence Plan
8.15	Outline Construction Traffic Management Plan
8.16	Outline Travel Plan
8.17	Outline Public Access Management Plan
8.18	Design Approach Document
8.19	Design Principles Statement
8.20	Outline Vessel Management Plan
8.21	Outline Scour Protection and Cable Protection Management Plan
8.22	Outline Biogenic Reef Mitigation Plan

9 Project Statements

9.1	Planning Statement
9.1.1	Policy Compliance Document
9.2	Cable statement
9.3	Safety Zone Statement
9.4	Statutory Nuisance Statement
9.5	Biodiversity Net Gain Report Principles and Approach

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