Hornsea Project Four: Additional Application Information

PINS Document Reference: F1.7
APFP Regulations: 5(2)(a)

F1.7: Scoping Opinion

Prepared Planning Inspectorate November 2018

Doc. No: F1.7
Version: A

The Planning Inspectorate
Yr Arolygiaeth Gynllunio

SCOPING OPINION:

Proposed Hornsea Four Wind Farm

Case Reference: EN010098

Adopted by the Planning Inspectorate (on behalf of the Secretary of State for Housing, Communities and Local Government) pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

November 2018

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1. INTRODUCTION

1.1 Background

1.1.1 On 15 October 2018, the Planning Inspectorate (the Inspectorate) on behalf of the Secretary of State (SoS) received a scoping request from Ørsted Hornsea Project Four Wind Farm (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed Hornsea Four Wind Farm (the Proposed Development).

1.1.2 In accordance with Regulation 10 of the EIA Regulations, an Applicant may ask the SoS to state in writing its opinion *'as to the scope, and level of detail, of the information to be provided in the environmental statement'.*

1.1.3 This document is the Scoping Opinion (the Opinion) provided by the Inspectorate on behalf of the SoS in respect of the Proposed Development. It is made on the basis of the information provided in the Applicant's report entitled Hornsea 4 Environmental Impact Assessment: Scoping Report (the Scoping Report). This Opinion can only reflect the proposals as currently described by the Applicant. The Scoping Opinion should be read in conjunction with the Applicant's Scoping Report.

1.1.4 The Applicant has notified the SoS under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development. Therefore, in accordance with Regulation 6(2)(a) of the EIA Regulations, the Proposed Development is EIA development.

1.1.5 Regulation 10(9) of the EIA Regulations requires that before adopting a scoping opinion the Inspectorate must take into account:

(a) any information provided about the proposed development;

(b) the specific characteristics of the development;

(c) the likely significant effects of the development on the environment; and

(d) in the case of a subsequent application, the environmental statement submitted with the original application.

1.1.6 This Opinion has taken into account the requirements of the EIA Regulations as well as current best practice towards preparation of an ES.

1.1.7 The Inspectorate has consulted on the Applicant's Scoping Report and the responses received from the consultation bodies have been taken into account in adopting this Opinion (see Appendix 2).

1.1.8 The points addressed by the Applicant in the Scoping Report have been carefully considered and use has been made of professional judgement and experience in order to adopt this Opinion. It should be noted that

when it comes to consider the ES, the Inspectorate will take account of relevant legislation and guidelines. The Inspectorate will not be precluded from requiring additional information if it is considered necessary in connection with the ES submitted with the application for a Development Consent Order (DCO).

1.1.9 This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in their request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (eg on submission of the application) that any development identified by the Applicant is necessarily to be treated as part of a Nationally Significant Infrastructure Project (NSIP) or Associated Development or development that does not require development consent.

1.1.10 Regulation 10(3) of the EIA Regulations states that a request for a scoping opinion must include:

(a) a plan sufficient to identify the land;

(b) a description of the proposed development, including its location and technical capacity;

(c) an explanation of the likely significant effects of the development on the environment; and

(d) such other information or representations as the person making the request may wish to provide or make.

1.1.11 The Inspectorate considers that this has been provided in the Applicant's Scoping Report. The Inspectorate is satisfied that the Scoping Report encompasses the relevant aspects identified in the EIA Regulations.

1.1.12 In accordance with Regulation 14(3)(a), where a scoping opinion has been issued in accordance with Regulation 10 an ES accompanying an application for an order granting development consent should be based on '*the most recent scoping opinion adopted (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion)*'.

1.1.13 The Inspectorate notes the intention to carry out an assessment under The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Habitats Regulations). This assessment must be co-ordinated with the EIA in accordance with Regulation 26 of the EIA Regulations. The Applicant's ES should therefore be co-ordinated with any assessment made under the Habitats Regulations. The Inspectorate notes the information in Section 5.6.5.1 of the Scoping Report with respect to the Evidence Plan process and in Paragraph 2.3.3.2 of the Scoping Report regarding the overlap in baseline information between the EIA and the information intended to support an assessment under the Habitats Regulations.

1.2 The Planning Inspectorate's Consultation

1.2.1 In accordance with Regulation 10(6) of the EIA Regulations the Inspectorate has consulted the consultation bodies before adopting a scoping opinion. A list of the consultation bodies formally consulted by the Inspectorate is provided at Appendix 1. The consultation bodies have been notified under Regulation 11(1)(a) of the duty imposed on them by Regulation 11(3) of the EIA Regulations to make information available to the Applicant relevant to the preparation of the ES. The Applicant should note that whilst the list can inform their consultation, it should not be relied upon for that purpose.

1.2.2 The list of respondents who replied within the statutory timeframe and whose comments have been taken into account in the preparation of this Opinion is provided, along with copies of their comments, at Appendix 2, to which the Applicant should refer in preparing their ES.

1.2.3 The ES submitted by the Applicant should demonstrate consideration of the points raised by the consultation bodies. It is recommended that a table is provided in the ES summarising the scoping responses from the consultation bodies and how they are, or are not, addressed in the ES.

1.2.4 Any consultation responses received after the statutory deadline for receipt of comments will not be taken into account within this Opinion. Late responses will be forwarded to the Applicant and will be made available on the Inspectorate's website. The Applicant should also give due consideration to those comments in preparing their ES.

1.3 Article 50 of the Treaty on European Union

1.3.1 On 23 June 2016, the United Kingdom (UK) held a referendum and voted to leave the European Union (EU). On 29 March 2017 the Prime Minister triggered Article 50 of the Treaty on European Union, which commenced a two year period of negotiations regarding the UK's exit from the EU. On 26 June 2018 The European Union (Withdrawal) Act 2018 received Royal Assent and work to prepare the UK statute book for Brexit has begun. The European Union (Withdrawal) Act 2018 will make sure that UK laws continue to operate following the UK's exit. There is no immediate change to legislation or policy affecting national infrastructure. Relevant EU Directives have been transposed into UK law and those are unchanged until amended by Parliament.

2. THE PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 The following is a summary of the information on the Proposed Development and its site and surroundings prepared by the Applicant and included in their Scoping Report. The information has not been verified and it has been assumed that the information provided reflects the existing knowledge of the Proposed Development and the potential receptors/ resources.

2.2 Description of the Proposed Development

2.2.1 The Applicant's description of the Proposed Development, its location and technical capacity (where relevant) is provided in Scoping Report in the Introduction in Chapter 1 and in more detail in Chapter 3.

2.2.2 The Proposed Development is for an offshore wind farm located approximately 65km off the coast of the East Riding of Yorkshire in the Southern North Sea. The Proposed Development will comprise both onshore and offshore infrastructure, including an offshore generating station comprising the wind turbine array, export cables to landfall, and connection via underground cables and onshore substation infrastructure to the electricity network. Table 3.3 of the Scoping Report presents parameters applicable to the Proposed Development these include; the anticipated number of turbines (up to 180); the maximum rotor diameter (up to 305m); and the minimum and maximum blade tip heights above lowest astronomical tide.

2.2.3 The proposed application site comprises an offshore area applicable to those parameters identified above and including the export cable search corridor which extends west to a landfall search area. The landfall search areas includes the landfall extent from a point just south of Bridlington to a point approximately 10km further south (shown on Figure 1.2). Table 3.2 states the wind farm area (as the Agreement for Lease) as a maximum of 846km^2. The onshore cable search area then extends in a south-westerly direction to the onshore substation search area situated in the vicinity of an existing National Grid substation at Creyke Beck, to the south of the settlement of Beverley.

2.2.4 The site is comprised of a combination of open sea, coastal intertidal mud and sand habitat, and arable farmland with areas of woodland and a network of streams and other wetland features. The onshore scoping area also contains a network of local and regional roads and a number of settlements.

2.3 The Planning Inspectorate's Comments

Description of the Proposed Development

2.3.1 The ES should include the following:

- a description of the Proposed Development comprising at least the information on the site, design, size and other relevant features of the development; and
- a description of the location of the development and description of the physical characteristics of the whole development, including any requisite demolition works and the land-use requirements during construction and operation phases

2.3.2 The anticipated generating capacity of the wind farm is not provided in the Scoping Report, and the description of the Proposed Development in Chapter 3 does not state parameters for the generating capacity of turbines being considered. The Applicant should adequately describe the relevant elements of the technical capacity of the Proposed Development in the ES, on which the assessment has been based.

2.3.3 The Scoping Report indicates that proposed energy balancing equipment will be included within parameters applicable to the proposed onshore substation. The Scoping Report includes no further detail in regard to these features. The ES should include more defined information with regards to parameters applicable to such equipment in order to provide confidence that any potential effects have been assessed in the ES. The Applicant should consider how this equipment may affect the technical capacity of the Proposed Development and ensure this is adequately described in the ES.

2.3.4 The Scoping Report states that the use of High Voltage Alternative Current (HVAC) or High Voltage Direct Current (HVDC) to export electricity to the network from the generating station has not yet been decided. In light of this, the Scoping Report explains that HVAC booster substations may or may not be required and may be subsea or surface structures. Table 3.4 of the Scoping Report presents parameters of up to three surface substations and up to 6 subsea structures. It is not clear whether the subsea structures are part of the surface substations or an alternative substation design. No parameters are set in Chapter 3 for the location of the booster substations, although Figure 6.42 (Shipping and Navigation assessment) and Section 6.11 (Seascape and Visual Resources) and its associated figures refer to a 'HVAC search area'. This is not applied to relevant onshore assessments, and specific comment is provided in Section 4 of this Scoping Opinion. These matters should be addressed in the ES to ensure a complete and consistent Project Description is applied to all assessments.

2.3.5 The Project Description does not discuss the need for other structures more typically found in proposals of this type e.g. weather mast(s). The Project Description in the ES should be comprehensive and consistent with the DCO in order to allow for the accurate assessment of impacts with the potential to result in significant effects.

2.3.6 The Scoping Report identifies that works to install both onshore and offshore cables may comprise either open-cut trenching or Horizontal Directional Drilling (HDD). The Inspectorate notes that details of the

extent and locations of these different methods are yet to be determined and advises that the ES should describe the construction techniques on which the assessment of significant environmental effects has been based.

2.3.7 The scoping boundary presented in the Scoping Report is stated as containing any land requirements for the purposes of construction and operation, including construction compounds and HDD launch sites. The intention to include areas for proposed access for operation and maintenance in the Preliminary Environmental Information Report (PEIR) and DCO application is noted from Table 4.1 of the Scoping Report. The ES should provide information on these elements in particular where they are likely to be located, and how these elements have been considered within the assessment of significant environmental effects.

2.3.8 The need for scour and cable protection has been identified in the Scoping Report however the type of protection is not discussed in detail and no parameters or worst-case (assuming that is the approach taken) in terms of volumes or footprint are presented as the basis for the scoping assessment. The ES should provide this information.

2.3.9 Figure 3.7 of the Scoping Report provides an indicative construction programme for the Proposed Development. The Inspectorate acknowledges that this information is currently at a high level and lacks certain detail; however, the ES should contain sufficient detail to support the assessment and to enable consideration of the temporal extent of impacts.

2.3.10 The Scoping Report provides outline information on the operation and maintenance activities considered at the scoping stage. The ES should provide a full description of the nature and scope of these activities, including the types of activity, their frequency, and how works will be carried out.

2.3.11 The information regarding decommissioning in Paragraph 3.6.1.3 and in Paragraph 5.7.3.2 of the Scoping Report is noted; however the ES should indicate the anticipated lifespan of the Proposed Development. The ES should provide the rationale behind the assessment of the potential significant effects of the decommissioning phase, including a description of anticipated decommissioning activities. Where there is uncertainty around decommissioning impacts this should be clearly explained along with the implications for the consideration of significant effects.

Alternatives

2.3.12 The EIA Regulations require that the Applicant provide 'A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.

2.3.13 The Inspectorate acknowledges the Applicant's intention to consider alternatives within the ES (Paragraph 4.1.1.1 of the Scoping Report). Chapter 4 of the Scoping Report addresses the options considered for the Proposed Development to date and briefly explains the proposed refinement process. The Inspectorate considers that the ES should include a discreet section that provides details of the reasonable alternatives studied and the reasons for the selection of the chosen option(s), including a comparison of the environmental effects.

Flexibility

2.3.14 The Inspectorate notes the Applicant's desire to incorporate flexibility into their draft DCO (dDCO) and its intention to apply a Rochdale Envelope approach for this purpose (Chapter 3 of the Scoping Report). Where the details of the Proposed Development cannot be defined precisely, the Applicant will apply a worst case scenario. The Inspectorate welcomes the reference to Planning Inspectorate Advice Note nine 'Using the 'Rochdale Envelope' (Paragraph 3.2.15 and 5.8.1.1 of the Scoping Report) in this regard.

2.3.15 Chapter 3 of the Scoping Report presents a parameters based approach for the purposes of scoping. The Inspectorate notes that several key design elements of the Proposed Development remain undecided, including whether to use HVAC or HVDC and which have resulting design implications. The nature and location of the equipment to be installed at the proposed onshore substation is also yet to be determined, with the option of 'energy balancing equipment' technologies (such as battery banks) being considered. The Inspectorate notes the intention to consider all potential options in the ES.

2.3.16 The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The development parameters will need to be clearly defined in the dDCO and in the accompanying ES. It is a matter for the Applicant, in preparing an ES, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations.

2.3.17 It should be noted that if the Proposed Development materially changes prior to submission of the DCO application, the Applicant may wish to consider requesting a new scoping opinion.

3. ES APPROACH

3.1 Introduction

3.1.1 This section contains the Inspectorate's specific comments on the scope and level of detail of information to be provided in the Applicant's ES. General advice on the presentation of an ES is provided in the Inspectorate's Advice Note Seven 'Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements'[1] and associated appendices.

3.1.2 Aspects/ matters (as defined in Advice Note Seven) are not scoped out unless specifically addressed and justified by the Applicant, and confirmed as being scoped out by the Inspectorate. The ES should be based on the Scoping Opinion in so far as the Proposed Development remains materially the same as the Proposed Development described in the Applicant's Scoping Report.

3.1.3 The Inspectorate has set out in this Opinion where it has/ has not agreed to scope out certain aspects/ matters on the basis of the information available at this time. The Inspectorate is content that the receipt of a Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultees to scope such aspects/ matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects/ matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.

3.1.4 Where relevant, the ES should provide reference to how the delivery of measures proposed to prevent/ minimise adverse effects is secured through DCO requirements (or other suitably robust methods) and whether relevant consultees agree on the adequacy of the measures proposed.

3.2 Relevant National Policy Statements (NPSs)

3.2.1 Sector-specific NPSs are produced by the relevant Government Departments and set out national policy for NSIPs. They provide the framework within which the Examining Authority (ExA) will make their recommendation to the SoS and include the Government's objectives for the development of NSIPs. The NPSs may include environmental requirements for NSIPs, which Applicants should address within their ES.

3.2.2 The designated NPS(s) relevant to the Proposed Development are the:

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[1] Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements and annex. Available from: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

- Overarching NPS For Energy (NPS EN-1);
- NPS on Renewable Energy Infrastructure (NPS EN-3);
- NPS for Electricity Networks Infrastructure (NPS EN-5);

3.3 Scope of Assessment

General

3.3.1 The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables:

- to demonstrate how the assessment has taken account of this Opinion;
- to identify and collate the residual effects after mitigation for each of the aspect chapters, including the relevant interrelationships and cumulative effects;
- to set out the proposed mitigation and/ or monitoring measures including cross-reference to the means of securing such measures (eg a dDCO requirement);
- to describe any remedial measures that are identified as being necessary following monitoring; and
- to identify where details are contained in the Habitats Regulations Assessment (HRA report) (where relevant), such as descriptions of European sites and their locations, together with any mitigation or compensation measures, are to be found in the ES.

3.3.2 The Inspectorate notes the approach set out in Section 5.12 of the Scoping Report with respect to the aspect of Human Health. The Inspectorate largely agrees with this approach, however, specific comment with respect to ground contamination is provided in Table 4.13 of this Opinion. The Scoping Report also acknowledges the potential effects from electro-magnetic radiation and associated mitigation, but does not state if this will be assessed. The Inspectorate advises the applicant to assess this matter where there is potential for significant environmental effects.

3.3.3 Chapter 5 and Annex C of the Scoping Report set out a general methodology for the EIA and specific methodologies for the environmental aspects included respectively. The aspect chapters of the Scoping Report summarise the predicted significance of effects however, limited detail of how those preliminary conclusions have been reached is included. The ES should demonstrate how the methodology has been used to assign value to each specific receptor/group of receptors and to consider the severity of impacts.

3.3.4 Many of the data sources relied upon in the preliminary assessments in the Scoping Report are several years old and in some circumstances the coverage of the Scoping Boundary is not complete. The ES must ensure a robust assessment and should demonstrate that the data applied to identify sensitive receptors is relevant and up to date. Any limitations to

the baseline data should be acknowledged and their implications for the assessment should be discussed in the ES.

3.3.5 Some of the Paragraph/Section referencing in the Scoping Report is inaccurate. It is also noted that the summary presented in Table 9.1 of the Scoping Report does not include the onshore assessments and it is assumed that this is a typographic error. The Applicant is reminded that the ES should be clear and accessible to readers.

Baseline Scenario

3.3.6 The ES should include a description of the baseline scenario with and without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

3.3.7 Chapter 8 of the Scoping Report identifies a number of other developments within the vicinity of the Proposed Development application site. The ES should clearly state which developments are incorporated in the future baseline and what development stage has been assumed applicable to each e.g. under construction or operational.

Forecasting Methods or Evidence

3.3.8 The ES should contain the timescales upon which the surveys which underpin the technical assessments have been based. For clarity, this information should be provided either in the introductory chapters of the ES (with confirmation that these timescales apply to all chapters), or in each aspect chapter.

3.3.9 The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

Residues and Emissions

3.3.10 The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.

Mitigation

3.3.11 Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, with

reference to specific DCO requirements or other legally binding agreements.

3.3.12 The Inspectorate notes the approach set out in Chapter 5 of the Scoping Report in this regard and the use of the Commitments Register presented in Annex B of the Scoping Report. However, the Scoping Report assesses the significance of effects after having taken into account all commitments as 'embedded mitigation'. This approach assumes that all 'embedded mitigation' will be delivered and is fully effective at removing/reducing impacts.

3.3.13 The Inspectorate advises that depending on specific circumstances this approach may lead to prematurely scoping out impacts and omitting assessment of potential significant environmental effects. Where a high level of certainty exists regarding severity of likely impacts, the receiving environment (receptors), and the delivery and effectiveness of mitigation, matters may be scoped out. Where uncertainty remains in any of these regards precaution should be applied and the assessment undertaken. Specific comments relating to this matter are provided within the environmental aspect tables in Section 4 of this Opinion. Reference to the Commitments in Annex B of the Scoping Report is made (as Co1, etc) where relevant.

Risks of Major Accidents and/or Disasters

3.3.14 The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The proposal in Paragraph 5.12.2.4 of the Scoping Report suggests that relevant aspect chapters to the ES will address this requirement rather than a stand-alone aspect chapter. The Inspectorate is content with this approach provided that impacts with the potential to result in significant effects are assessed. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executives (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.

3.3.15 Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the

significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

Climate and Climate Change

3.3.16 The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development. This may include, for example, alternative measures such as changes in the use of materials or construction and design techniques that will be more resilient to risks from climate change.

Transboundary Effects

3.3.17 Schedule 4 Part 5 of the EIA Regulations requires a description of the likely significant transboundary effects to be provided in an ES. The Inspectorate notes the screening of Transboundary Effects presented in Annex K of the Scoping Report. The screening reported in this Annex concludes that the Proposed Development may have significant effects on other European Economic Area (EEA) State(s).

3.3.18 Regulation 32 of the EIA Regulations inter alia requires the Inspectorate to publicise a DCO application on behalf of the SoS if it is of the view that the proposal is likely to have significant effects on the environment of another EEA state, and where relevant, to consult with the EEA state affected.

3.3.19 The Inspectorate considers that where Regulation 32 applies, this is likely to have implications for the examination of a DCO application. The Inspectorate recommends that the ES should identify whether the Proposed Development has the potential for significant transboundary effects and if so, what these are and which EEA States would be affected.

A Reference List

3.3.20 A reference list detailing the sources used for the descriptions and assessments must be included in the ES.

3.4 Confidential Information

3.4.1 In some circumstances it will be appropriate for information to be kept confidential. In particular, this may relate to information about the presence and locations of rare or sensitive species such as badgers, rare birds and plants where disturbance, damage, persecution or commercial exploitation may result from publication of the information. Where documents are intended to remain confidential the Applicant should provide these as separate paper and electronic documents with their confidential nature clearly indicated in the title, and watermarked as such on each page. The information should not be incorporated within other

documents that are intended for publication or which the Inspectorate would be required to disclose under the Environmental Information Regulations 2014.

4. ASPECT BASED SCOPING TABLES

4.1 Marine Geology, Oceanography and Physical Processes

(Scoping Report section 6.1)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.1.1	Table 6.3, Row 3	Scouring around foundations during operation	Scour protection is proposed around all turbine foundations (Co82). The Scoping Report suggests there is currently uncertainty in relation to the timing of delivery for scour protection (paragraphs 6.1.5.3 and 6.1.7.1) and states that the protection would only provide embedded mitigation against scouring if placed prior to foundation installation. The Planning Inspectorate therefore does not agree that this matter can currently be scoped out of the ES. A worst-case scenario should be assessed, with consideration of the type and quantity of scour protection as secured through the DCO. If the applicant can guarantee scour protection placed prior to foundation installation as part of the embedded mitigation package, then a full assessment will not be necessary.
4.1.2	Table 6.3, Row 6	Changes to sediment pathways during operation	Given that the assessments for Hornsea Projects One, Two, and Three predicted minor adverse effects on sediment pathways, and the change in tidal currents and waves for Hornsea 4 anticipated to be localised during operation, the Inspectorate agrees that this matter can be scoped out of the ES in so far as sediment pathways at the array area and for the offshore cable route, as local or regional changes in the sediment transport regime are not likely during operation. However, in light of a rapidly changing coastline, and without sufficient detail about impacts and activity during the operation and maintenance phase, there is some uncertainty in relation to effects of the cable on sediment pathways in the intertidal area. The effect on

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			sediment pathways should be scoped in from Smithic Bank inshore to the mean high water spring tide (MHWS) level.

4.2 Subsea Noise

(Scoping Report section 6.2)

ID	Ref	Applicant's proposed aspect to scope out	Inspectorate's comments
4.2.1	Paragraph 6.2.3.3	Potential subsea noise impacts during operation and maintenance	While the Planning Inspectorate acknowledges that consideration of this matter within other ESs relating to offshore wind farms of similar scale have not predicted significant effects, the evidence is not presented within the Scoping Report. Based on the information available at the moment, the Planning Inspectorate does not agree to scope this aspect out of the ES.
4.2.2	Section 6.2	Subsea noise assessment to be included as an appendix to the ES, and considered under separate aspect chapters.	The Inspectorate is content that impacts from subsea noise can be assessed under relevant other aspect chapters according to receptors rather than under a separate subsea noise chapter. Specific comments in relation to the inclusion of subsea noise impacts during operation and maintenance of the Proposed Development are made under relevant aspects (Scoping Report Sections 6.4, 6.5, 6.8 and 6.12).

4.3 Benthic and Intertidal Ecology

(Scoping Report section 6.3)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.3.1	Table 6.7, Row 1	Temporary habitat disturbance in the Hornsea Four array area and offshore Export Cable Corridor (ECC) from construction activities	The Planning Inspectorate does not currently agree to scope these matters out of the ES, based on shortcomings in the baseline evidence. The Scoping Report presents baseline data gathered for Hornsea Zone and Hornsea Project One. This information is now relatively old, dating back to 2010 and 2011, and provides what appears to be incomplete coverage of the array area and cable corridor. The Scoping Report does not clearly demonstrate if this survey data is still representative of the baseline conditions given the eight years since completion In absence of an up to date and complete baseline there is some uncertainty associated with the approach advocated in the Scoping Report and this affects confidence in the findings. The absence of an up to date and complete baseline limits the ability of the applicant to quantify any increases expected as a result of the Proposed Development. There is insufficient certainty in relation to the effectiveness of some of the commitments, as highlighted in the table below. Specifically, the Planning Inspectorate has not agreed to scope out effects on scour effect under the Marine Geology, Oceanography and Physical Processes section due to uncertainty about Co82, and as such cannot agree to scope out changes to seabed habitats arising from effects on physical processes (Table 6-7, Row 13). The Planning Inspectorate cannot agree to scope this whole aspect out of the ES unless there is some evidence to justify
4.3.2	Table 6.7, Row 2	Temporary habitat disturbance in the intertidal area from export cable installation	
4.3.3	Table 6.7, Row 3	Temporary increase in Suspended Sediment Concentrations (SSC) and sediment deposition in the Hornsea Four array area and offshore ECC	
4.3.4	Table 6.7, Row 4	Temporary increase in SSC and sediment deposition in the intertidal area	
4.3.5	Table 6.7, Row 6	Direct and indirect seabed disturbances leading to the release of sediment contaminants	
4.3.6	Table 6.7, Row 8	Long-term habitat loss/ change from the presence of foundations, scour protection and cable protection	
4.3.7	Table 6.7, Row 9	Colonisation of the Wind Turbine Generators (WTG) and scour/ cable protection may affect benthic ecology and biodiversity	

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.3.8	Table 6.7, Row 10	Increased risk of introduction or spread of MINNS due to presence of subsea infrastructure and vessel movements (e.g. ballast water) may affect benthic ecology and biodiversity	the use of old survey data to inform the baseline. The Applicant should make effort to agree the supporting information applied to the assessment with the relevant consultees.
4.3.9	Table 6.7, Row 11	Direct disturbance to seabed from jack-up vessels and cable maintenance activities	
4.3.10	Table 6.7, Row 13	Changes to seabed habitats arising from effects on physical processes, including scour effects and changes in the sediment transport and wave regimes resulting in potential effects on benthic communities	
4.3.11	Table 6.7, Row 15	Temporary habitat disturbance from removal of foundations and cables	
4.3.12	Table 6.7, Row 16	Increased SSC and sediment deposition from removal of foundations and cables	
4.3.13	Table 6.7, Row 17	Loss of introduced habitat from the removal of foundations	
4.3.14	Table 6.7, Row 5	Impacts on benthic ecology from subsea noise arising from foundation installation	The Planning Inspectorate is content that the potential for significant effects from subsea noise during foundation installation is unlikely to occur having regards to the sensitivity of benthic ecology to subsea noise. The Planning Inspectorate is content that his matter can be scoped out of the ES.
4.3.15	Table 6.7,	Indirect disturbance to benthic habitats from	The Planning Inspectorate is content that the potential for

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	Row 12	electromagnetic fields (EMFs) generated by inter-array and export cables	significant effects from EMF from cables is unlikely to occur having regards the sensitivity of benthic ecology to EMF. The Planning Inspectorate is content that his matter can be scoped out of the ES.
4.3.16	Table 6.7, Row 7	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology during construction.	The Planning Inspectorate is content that the mitigation measures proposed through Co111, including a Marine Pollution Contingency Plan, should be sufficient address the likely impacts and avoid a likely significant effect, accordingly this matter can be scoped out of the ES. The ES should include details of the mitigation and explain how its delivery is assured with reference to relevant documents.
4.3.17	Table 6.7, Row 14	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology during operation	
4.3.18	Table 6.7, Row 18	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology during decommissioning	

ID	Ref	Other points	Inspectorate's comments
4.3.19	Table 6.6	Effectiveness of Commitments	There is insufficient certainty about the commitments set out in relation to Benthic and Intertidal Ecology. These measures should be secured through suitably robust methods e.g. conditions to dML or requirements to DCO. The applicant is reminded that they should consult the statutory consultees on the wording of commitments, and the content of the Project Environmental Management and Monitoring Plan (Co111).

4.4 Fish and Shellfish Ecology

(Scoping Report section 6.4)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.4.1	Table 6.12, Row 1	Construction phase: Direct damage (eg crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from construction activities.	The Inspectorate agrees that significant effects are unlikely given the likely magnitude of the impact and the characteristics of the potential receptors. It is agreed that this matter can be scoped out of the ES.
4.4.2	Table 6.12, Row 2	Construction phase: Temporary localised increases in SSC and smothering.	The Scoping Report does not demonstrate with reference to necessary baseline information how impacts from smothering to nearby herring populations would not result in a likely significant effect. This is a position which the Marine Management Organisation (MMO) also take in their consultation response. The Inspectorate does not agree to scope this matter out of the ES. The ES should include an assessment of impacts resulting from increased SSC and smothering to relevant fish and shellfish populations including Herring.
4.4.3	Table 6.12, Row 3	Construction phase: Direct and indirect seabed disturbances leading to the release of sediment contaminants.	The Scoping Report states that sediment chemistry analysis within the array area indicates levels of contamination below those likely to cause significant effects to fish and shellfish. No data is provided to support this statement. It also states that raised levels of contaminants were noted in coastal areas but again, no data is provided. The Inspectorate does not agree to scope this matter out of the assessment in the ES.
4.4.4	Table 6.12, Row 5	Construction phase: Accidental pollution events during the construction phase resulting in potential effects on fish and	The Inspectorate agrees that due to the low risk of impacts and given the confidence that effective mitigation measures can be implemented, this potential effect can be scoped out of the impact assessment given the low risk of significant effects occurring.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		shellfish receptors.	
4.4.5	Table 6.12, Row 6 Paragraph 6.4.7.10	Operational phase: Long-term loss of habitat due to the presence of turbine foundations, scour protection and cable protection.	The Scoping Report lacks detailed baseline data and information regarding the anticipated magnitude of impacts (including from scour and cable protection). The MMO's consultation response also identifies concerns with regard to herring populations. Accordingly, the Inspectorate does not agree to scope this matter out.
4.4.6	Table 6.12, Row 7 Paragraph 6.4.7.11	Operational phase: Increased hard substrate and structural complexity as a result of the introduction of turbine foundations, scour protection and cable protection.	The Inspectorate has had regard to views expressed by MMO in relation to this matter and the potential impacts on spawning herring in particular. The Inspectorate does not agree to scope this matter out and advises that an assessment must be made in the ES where significant effects could occur.
4.4.7	Table 6.12, Row 8 Paragraph 6.4.7.12	Operational phase: Underwater noise as a result of operational turbines.	The Inspectorate considers that insufficient evidence on the nature and sensitivity of receptors and magnitude of impacts has been provided in order to scope this matter out. It is considered that significant effects may occur and therefore this matter should be assessed in the ES. The Inspectorate also advises that this matter is taken into the cumulative effects assessment.
4.4.8	Table 6.12, Row 9 Paragraph 6.4.7.15	Operational phase: Electromagnetic fields (EMF) effects arising from cables.	The Inspectorate agrees that significant effects are unlikely given the magnitude of the impact and the sensitivity of the receptors. It is agreed that this matter can be scoped out of the ES.
4.4.9	Table 6.12, Row 10 Paragraph 6.4.7.18	Operational phase: Direct disturbance resulting from maintenance during operation.	The Inspectorate agrees that significant effects are unlikely given the information provided on the magnitude of the impacts. It is agreed that this matter can be scoped out of the ES. The comments in this Scoping Opinion regarding the description of maintenance should be considered in the ES.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.4.10	Table 6.12, Row 11 Paragraph 6.4.7.19	Operational phase: Indirect disturbance resulting from the accidental release of pollutants.	The Inspectorate agrees that significant effects are unlikely given the likely magnitude of the impact in light of established effective mitigation measures being implemented, and the sensitivity of the receptors. It is agreed that this matter can be scoped out of the ES.
4.4.11	Table 6.12, Row 12 Paragraph 6.4.7.20	Operational phase: Potentially reduced fishing pressure within the Hornsea Four array area and increased fishing pressure outside the array area due to displacement.	The Inspectorate acknowledges that reduced fishing pressure may result in positive effects to commercially targeted species. The Inspectorate does not agree to scope this matter out. The ES should assess any benefits associated with the reduced pressure within the Hornsea Four array where significant effects are likely. The Scoping Report provides very little information regarding the anticipated increased fishing pressure outside of the array. The Inspectorate does not agree to scope out an assessment of impact associated with the displacement of fishing activities. The ES should assess impacts associated where significant effects are likely to occur.
4.4.12	Table 6.12, Row 13 Paragraph 6.4.7.21	Decommissioning phase: Direct damage (e.g. crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from decommissioning activities.	Based on the decommissioning activities being anticipated to be similar to construction, and that the sensitivity of potential receptors will be similar at the time of decommissioning, the Inspectorate agrees that significant effects are unlikely. It is agreed that this matter can be scoped out of the ES.
4.4.13	Table 6.12, Row 14 Paragraph 6.4.7.22	Decommissioning phase: Temporary localised increases in SSC and smothering.	As for construction, without further evidence it is not possible to rule out significant effects on all receptors. The Applicant's attention is drawn to advice from the MMO with respect to herring in particular. The Inspectorate does not agree to scope this matter out and advises that an assessment must be made in the ES of impacts resulting from increased SSC and smothering to relevant fish and shellfish populations.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.4.14	Table 6.12, Row 15 Paragraph 6.4.7.22	Decommissioning phase: Direct and indirect seabed disturbances leading to the release of sediment contaminants.	No further information is provided to scope out this matter than that which is discussed with regards to Table 6-12, Row 3 above. On this basis, the Inspectorate considers that insufficient evidence has been provided about the likely impacts and receptors of associated effects and is unable to scope out this matter out of ES. The Applicant should make effort to agree the supporting information applied to the assessment with the relevant consultees.
4.4.15	Table 6.12, Row 16 Paragraph 6.4.7.23	Decommissioning phase: Mortality, injury, behavioural changes and auditory masking arising from noise and vibration.	The Scoping Report describes the magnitude of the impact to be minor, however no data is provided to support this statement. Given that the Scoping Report proposes to scope in these impacts for construction, the Inspectorate does not consider that the decision to scope out during decommissioning is justified. The MMO have provided comment on this matter in their consultation response, in particular regarding supporting data about anticipated noise levels during decommissioning. The Applicant should make effort to agree adequate supporting data with consultees.
4.4.16	Table 6.12, Row 17 Paragraph 6.4.7.24	Decommissioning phase: Accidental pollution events during the decommissioning phase resulting in potential effects on fish and shellfish receptors.	The Inspectorate agrees that significant effects are unlikely given the magnitude of the impact in light of established effective mitigation measures being implemented and the sensitivity of the receptors. It is agreed that this matter can be scoped out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.4.17	Table 6.12, Row 4, Paragraph 6.2.4.3	Noise propagation modelling	The Scoping Report states that the area impacted by subsea noise will be calculated using noise propagation modelling. The principles for the modelling outlined in Paragraph 6.2.4.3 are noted; however the ES must include a full methodology and demonstrate how it has been applied to the assessment. Effort should be made by the Applicant to

ID	Ref	Other points	Inspectorate's comments
			agree the methodology with relevant consultees and the commitment to do so in Paragraph 6.2.4.3 is welcomed.
4.4.18	Paragraph 6.4.8.1	Baseline data	Species that have the potential to be affected will be identified based on the surveys and data presented in Table 6-8. Many of these data sources are several years old and the coverage (as shown in Figure 6.15) does not include large parts of the ECC. Limitations in the data are also acknowledged (for example undetermined intensity of spawning/nursery grounds). The ES must ensure a robust assessment and should demonstrate that the data applied to identify sensitive receptors is relevant and up to date. Any limitations should be acknowledged and their implications for the assessment should be discussed in the ES. The MMO and Natural England (NE) provide some more specific advice with regard to these matters in their consultation response. The Applicant should make effort to agree the baseline used in the assessment with the relevant consultees.

4.5 Marine Mammals

(Scoping Report section 6.5)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.5.1	Table 6.16, Row 3, 13 and 23 and Paragraphs 6.5.7.1 to 6.5.7.3	Temporary Threshold Shift (TTS) (construction, operation and decommissioning)	The impacts of noise on foraging capability and fitness will be considered in the ES under the assessment of 'disturbance'. However, as indicated by the MMO, the characteristics of TTS are distinct from behavioural disturbance. TTS poses potential impacts to marine mammals and the Scoping Report provides no evidence to demonstrate that there will be no significant effect. The Inspectorate therefore does not agree to scope this matter out. The ES should assess impacts to marine mammal from TTS during all phases of development where likely significant effects could occur.
4.5.2	Table 6.16, Row 14 and Paragraphs 6.5.7.4 to 6.5.7.6	Operational Noise (operation)	Based on the likely magnitude of impacts associated with maintenance of the export cable corridor, the Inspectorate considers that significant effects are unlikely with respect to this element of the Proposed Development. The Scoping Report provides relevant references and field data but there are no definitions of thresholds and estimations of the potential operational noise of the turbine array and its impact zone in relation to the scale of the Proposed Development. Operational activities associated with the substations are not specifically discussed in the Scoping Report. The Inspectorate considers that significant effects could occur during operation of the wind farm array and the substations and advises that these matters must be assessed in the ES. The comments (4.4.17 above) with respect to noise propagation modelling should be taken into account.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.5.3	Table 6.16, Row 6, 17 and 26 and Paragraphs 6.5.7.7 and 6.5.7.8	Reduction in Prey Availability (construction, operation and decommissioning)	It is acknowledged in the Scoping Report that impacts on Marine Mammals in relation to reduction in prey availability during construction, operation and decommissioning cannot be determined until potential significant effects have been assessed in the relevant cross-referenced Chapters (fish and shellfish ecology). In light of this dependence the Inspectorate cannot agree to scope out this matter until these assessments have been conducted. The ES must ensure that inter-relationships between assessments are fully explored and that all relevant data are used to inform the assessment of significant effects.
4.5.4	Table 6.16, Row 7, 18 and 27 and Paragraphs 6.5.7.9 to 6.5.7.12	Reduction in Foraging Ability (construction, operation and decommissioning)	The Scoping Report has limited detail regarding the extent to which sensitive marine mammal species may be affected by changes in foraging habitat including impacts on visibility. Information is provided in relation to harbour porpoise and harbour seals but there is no information in regards to odontocetes which have been identified within the study area. The ES should assess the extent to which increases in suspended sediment may affect foraging ability of relevant marine mammal species where significant effects are likely to occur.
4.5.5	Table 6.16, Row 8, 19 and 28 and Paragraph 6.5.7.13	Toxic Contamination (construction, operation and decommissioning)	The Scoping Report states that a Marine Pollution Contingency Plan is to be included in the ES outlining mitigation measures should an accidental spill occur, address potential contaminant releases and include key emergency contact details. Provided this Plan is in place, the Inspectorate agrees to scope out this matter due to the low likelihood of significant effects occurring.
4.5.6	Table 6.16, Row 20 Paragraph	EMF (operation)	The Inspectorate agrees that given the nature of the Proposed Development and the referenced literature provided in the Scoping Report, significant effects are unlikely and operational EMF effects on

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	6.5.7.14 and 6.5.7.15		Marine Mammals can be scoped out of the ES.
4.5.7	Table 6.16, Row 10 and Paragraph 6.5.7.16	Disturbance of Haul-Out Sites (construction)	The Inspectorate is content that there is unlikely to be significant effects from disturbance during construction to haul out sites the nearest of which is >50km away from the proposed landfall. The Inspectorate is content that this matter can be scoped out of the ES on that basis.

ID	Ref	Other points	Inspectorate's comments
4.5.8	Section 6.5.2	Study Areas	The ES should clearly present and explain the study area used to inform the assessment. Information sources should be referenced and it should be clear how any such information has influenced the chosen study areas. The ES should include a figure(s) to depict the extent of the study areas the location of surveys undertaken.
4.5.9	6.5.8.3	Marine Mammal Sensitivity to PTS	The Scoping Report states that piling noise is low frequency. The Inspectorate considers that the ES should provide an assessment of low frequency noise on relevant receptors where significant effects are likely. Advice should be sought from the relevant consultees regarding potential receptors and their sensitivity.

4.6 Offshore and Intertidal Ornithology

(Scoping Report section 6.6)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.6.1	Table 6.25, Row 2	Indirect impacts during construction through effects on habitats and prey species.	The Inspectorate agrees that where the impact on habitats and prey species is not predicted to be significant, that indirect or secondary impacts on relevant bird species will not be significant. However, the Planning Inspectorate has not agreed to scope out matters relating to habitats and prey species under Benthic and Intertidal Ecology or Fish and Shellfish Ecology. As such, based on currently available information, the Inspectorate cannot agree to scope these matters out and advises that an assessment should be made in the ES.
4.6.2	Table 6.25, Row 8	Indirect impacts during operation through effects on habitats and prey species.	
4.6.3	Table 6.25, Row 13	Indirect impacts during decommissioning through effects on habitats and prey species.	
4.6.4	Table 6.25, Row 10	Disturbance and displacement of species due to maintenance of the export cable.	The Scoping Report states that maintenance works will be limited both in terms of the spatial and temporal nature and proposes to scope out this effect. Having regard to the nature and likely scale of this impact, the Planning Inspectorate agrees this matter can be scoped out of the ES.
4.6.5	Table 6.25, Row 11	Disturbance and displacement of waterbird species due to maintenance of the export cable through the intertidal zone.	The Scoping Report states that the works will be limited both spatially and temporally, that no significant numbers of birds make use of the intertidal zone at the landfall, and proposes to scope out this effect. However, in their consultation response NE provide evidence to the contrary and highlight the potential for great value to be assigned to this habitat in relation to sanderling populations. The Planning Inspectorate is not content to agree to scope out this matter from the ES and considers that an assessment of impacts to ornithological receptors should be undertaken where significant effects are likely.

4.7 Marine Archaeology

(Scoping Report section 6.7)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.7.1	Table 6.3, Row 1	Removal of sediment containing undisturbed archaeological contexts leading to total loss of the receptor during preparation of the seabed for WTG and offshore substation foundations.	The Scoping Report acknowledges that the magnitude of these impacts is high and that as a worst case marine archaeological receptors are considered to be of high significance. The Scoping Report proposes to scope out detailed assessment of these matters on the basis that there is mitigation which can be embedded into the Proposed Development as follows: • infrastructure to avoid any known wrecks (with a buffer of 50m around wreck) (Co46), • establishment of archaeological exclusion zones as required to protect any known / identified marine archaeological receptors (Co140), • a Written Scheme of Archaeological Investigation including the development and implementation of a Protocol for Archaeological Discoveries (Co141), and • A programme of geoarchaeological assessment and analysis, resulting in the delivery of a paleogeographic ground-model (Co142). The Scoping Report does not provide specific detail in respect to these measures but they are acknowledged to constitute recognised methods of control for the impacts described. The Planning Inspectorate is content that if the above measures are adequately secured (with reference to implementation) and presented in sufficient detail then they may be relied upon as means to demonstrate an
4.7.2	Table 6.3, Row 2	Intrusion of piling foundations disturbing or destroying archaeological receptors.	
4.7.3	Table 6.3, Row 3	Compression of stratigraphic contexts containing archaeological material from combined weight of foundation, transition piece, tower, and wind turbine.	
4.7.4	Table 6.3, Row 4	Disturbance of sediment containing potential archaeological receptors (material and contexts) during inter-array cable laying operations.	
4.7.5	Table 6.3, Row 5	Disturbance of sediment containing potential archaeological receptors (material and contexts) during export cable laying operations.	

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.7.6	Table 6.3, Row 6	Penetration and compression effects of jack-up barges and anchoring of construction vessels during turbine, sub-station or cable installation leading to total or partial loss of archaeological receptors (material or contexts).	absence of significant effect in the ES. The Applicant should make effort to agree the detail in relation to these measures with relevant consultation bodies.
4.7.7	Table 6.3, Row 10	Penetration and compression effects of jack-up barges and anchoring of decommissioning vessels leading to total or partial loss of archaeological receptors (material or contexts).	

4.8 Commercial Fisheries

(Scoping Report section 6.8)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.8.1	Table 6.33, Rows 5, 13 & 21 Paragraph 6.8.7.4	Displacement or disruption of commercially important fish and shellfish resources (during construction, operation and decommissioning).	The primary justification provided in the Scoping Report for scoping this matter out is a cross-reference to the conclusions drawn in the Fish and Shellfish Ecology chapter regarding a similar matter[2]. As the latter refers to the array area and the operational phase only, the justification is incomplete. In light of this the Inspectorate has insufficient information to enable this matter to be scoped out of the assessment and does not agree to do so.
4.8.2	Table 6.33, Rows 6, 14 & 22 Paragraph 6.8.7.5	Additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the array and export cable areas (during construction, operation and decommissioning).	The Inspectorate agrees that this potential effect can be scoped out of the impact assessment having regard to the magnitude of the impact.
4.8.3	Table 6.33, Row 7, 15 & 23 Paragraph 6.8.7.7	Increased vessel traffic within fishing grounds leading to interference with fishing activity (during construction, operation and decommissioning).	It is not evident how information on the anticipated number of vessel movements that will be associated with the construction, operation and decommissioning of the Proposed Development has been taken into account. Additionally, the datasets used in the Scoping Report do not capture the fishing activity undertaken in inshore areas by vessels smaller than 15m, which are likely to be more vulnerable to interference with their fishing activity. Insufficient information is

[2] Operational phase: Potentially reduced fishing pressure within the Hornsea Four array area and increased fishing pressure outside the array area due to displacement" (see Table 6-12, Row 12, and paragraph 6.4.7.20)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			therefore provided to scope this matter out of the assessment, and the Inspectorate advises that it must be assessed in the ES where significant effects are likely to occur.

ID	Ref	Other points	Inspectorate's comments
4.8.4	Paragraph 6.8.8.3	Baseline data	The Scoping Report states that baseline data "*may be* supplemented by the results of vessel-based fishing activity reconnaissance survey work". It is unclear on what basis this additional survey work would or would not be undertaken. The ES should clearly explain what data has been used to inform the assessment and how it has been applied.

4.9 Shipping and Navigation

(Scoping Report section 6.9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.9.1	Table 6.36	No matters scoped out in relation to Shipping and Navigation	Inspectorate is content with the matters proposed to be assessed in relation to shipping and navigation as set out in Table 6-36.

4.10 Aviation and Radar

(Scoping Report section 6.10)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.10.1	Table 6.39, Row 1	WTG effects on civil and military radar systems during construction process	As there is no pathway of effect on civil and military radar systems during construction as the turbines will not be rotating, the Inspectorate agrees that this matter can be scoped out of the ES.
4.10.2	Table 6.39, Row 2	Physical obstruction effects from WTG on Search and Rescue helicopter flight operations.	While embedded mitigation set out in the Scoping Report will minimise effects to aviation flight operations through notification to aviation stakeholders, and lighting of WTG, the infrastructure may still present a physical obstruction in the area of flight operations. Currently there is no certainty as to the extent of these obstacles and as such, the Planning Inspectorate considers that these impacts should be assessed where significant effects are likely to occur.
4.10.3	Table 6.39, Row 9	Physical obstruction effects from WTG on civil and military flight operations (including military Low Flying activity).	
4.10.4	Table 6.39, Row 7	Under aviation flight rules, the Minimum Sector Altitude is the altitude below which it is unsafe to fly in poor visibility/cloud owing to presence of terrain or obstacles within a specified area.	The Planning Inspectorate agrees that these two matters should be considered as embedded mitigation for the scheme, to minimise any effects on aviation. However, it is not clear from the wording of these two matters what specifically is intended to be scoped out. Where likely significant effects are expected in relation to any of these matters, they should be assessed in the ES.
4.10.5	Table 6.39, Row 8	There is expected to be a requirement for Aviation Obstruction Lighting on the construction and decommissioning infrastructure and all or individual WTG based on Civil Aviation Authority regulations. The fitting of appropriate lighting would ensure	

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		conspicuity of the WTG and infrastructure to stakeholders.	

ID	Ref	Other points	Inspectorate's comments
4.10.6	Table 6.39, Row 3	Air Defence Radar Sites	The Planning Inspectorate highlights the Ministry of Defence recommendation that the assessment should consider the air defence radar site at RAF Staxton Wold as a relevant receptor for the assessment of effects on radar systems during operation, in addition to the sites at RAF Brizlee Wood and RAF Trimingham.

4.11 Seascape and Visual

(Scoping Report section 6.11)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.11.1	Table 6.42, Row 1	Visual impact of offshore construction activities by day and night on offshore visual receptors.	Although these matters refer to offshore visual receptors, and the Flamborough Headland Heritage Coast is onshore, the designation is referenced in Section 6.11 of the Scoping Report under Seascape and Visual Impacts rather under Landscape and Visual Impacts. The Flamborough Headland Heritage Coast lies within the current 25km study area for the offshore HVAC substation. In addition, the Zone of Theoretical Visual Influence (ZTVI) (Figure 6-61) shows that turbine blades will be visible from the Heritage Coast designation. The Scoping Report argues that the visual effect on any designations such as the Heritage Coast is limited due to distance. However, the viewpoints identified in Figure 6.60 of the Scoping Report do not cover views from the Heritage Coast and this highlights uncertainty in relation to this conclusion. Table 6-42 notes that the anticipated magnitude of the impact for this matter is a range from *"Moderate to Low"*, while the anticipated sensitivity of the receptor is *"Low to Medium"*. According to the significance matrix presented in Figure 5.1 of the Scoping Report, a *Moderate* magnitude impact on a receptor of *Medium* sensitivity would lead to a moderate effect (significant in EIA terms). Without greater certainty in relation to the anticipated magnitude of impact at the Heritage Coast, the Planning Inspectorate cannot agree to scope this matter out of the ES as there may be significant effects on the Heritage Coast designation.
4.11.2	Table 6.42, Row 5	Visual impact of HVAC booster substations and Array Area by day and night on offshore visual receptors.	
4.11.3	Table 6.42, Row 9	Visual impact of offshore decommissioning activities by day and night on offshore visual receptors.	
4.11.4	Table 6.42, Row 2	Impact on seascape character from offshore construction activities.	The array area will be located within the Dogger Deep Water Channel National Seascape Character Area as described in Table 6-41 of the

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.11.5	Table 6.42, Row 3	Impact on historical seascape character from offshore construction activities.	Scoping Report, and the anticipated sensitivity of the receiving environment is generally low. However, in light of the emerging practice and understanding around this matter and applying a precautionary approach the Planning Inspectorate advises that effect on seascape character should not be scoped out of the ES and that an assessment should be made where likely significant effects could occur.
4.11.6	Table 6.42, Row 6	Impact on seascape character from offshore HVAC booster substations and Array Area.	
4.11.7	Table 6.42, Row 7	Impact on historic seascape character from offshore HVAC booster substations and Array Area.	
4.11.8	Table 6.42, Row 10	Impact on seascape character from offshore decommissioning activities.	
4.11.9	Table 6.42, Row 11	Impact on historical seascape character from offshore decommissioning activities.	
4.11.10	Table 6.42, Row 4	Cumulative seascape character and visual impacts from offshore construction activities.	The Scoping Report acknowledges in Table 6-41 that Hornsea Projects One, Two, and Three are located within the Dogger Deep Water Channel National Seascape Character Area and would alter its character substantially if they proceed. Paragraph 6.11.4.6 acknowledges that the increased influence of nearby offshore wind farm developments is of particular importance. However, there is little justification given as to why cumulative impacts on seascape and visual impact should be scoped out (either in this section, or in Section 8 Cumulative Effects). The Planning Inspectorate does not agree to scope this aspect out of the ES based on current information.
4.11.11	Table 6.42, Row 8	Cumulative seascape character and visual impacts from offshore HVAC booster substations and Array Area.	
4.11.12	Table 6.42, Row 12	Cumulative seascape character and visual impacts from offshore decommissioning activities.	

ID	Ref	Other points	Inspectorate's comments
4.11.13	6.11.2	Study Area	The Scoping Report does not explain how the study area for the assessment has been derived. The Inspectorate does not agree to an arbitrary radius for a study area (50km for the array area or 25km for the offshore substation), and advises that the study area is informed by the extent of the likely impacts.

4.12 Infrastructure

(Scoping Report section 6.12)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.12.1	Table 6.47, Row 1	Aggregate dredging activities	The Planning Inspectorate agrees that there is unlikely to be significant effects associated with aggregate dredging activities on the basis that there is no licensed site located within 30km to the Proposed Development. The Inspectorate is content that this matter can be scoped out of the ES on that basis.
4.12.2	Table 6.47, Row 2	Disposal sites	The Scoping Report indicates that there are no licensed sites within 2km to the Proposed Development. However, there is little information to explain whether construction activities and/or operational restrictions to access would affect the operation of the disposal site. If significant effects are likely to occur in this regard these should be assessed within the ES.
4.12.3	Table 6.47, Row 3	Impacts on the proposed Endurance Carbon Capture and Storage (CCS) site	As there are currently no active CCS projects that would make use of the Endurance reservoir, the Planning Inspectorate agrees to scope out this matter from the Infrastructure assessment in the ES. This position should be reviewed as the cumulative effects assessment for the Proposed Development is refined.
4.12.4	Table 6.47, Row 4	Impacts on existing or proposed pipelines or cables or restrictions on access to pipelines or cables	Embedded mitigation within the scheme, including crossing and proximity agreements with known existing pipeline and cables operators (Co107), will ensure access for cable or pipeline repair and maintenance, and as such the Planning Inspectorate agrees that these matters do not need to be included within the scope of the ES. As assessments at the adjacent Hornsea projects have not predicted significant effects on existing cables and pipelines, this further
4.12.5	Table 6.47, Row 10	Temporary loss of access to existing or proposed pipelines or cables for repair or maintenance.	

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.12.6	Table 6.47, Row 18	Impacts on existing or proposed pipelines or cables or restrictions on access to pipelines or cables	supports the scoping out of these matters.

4.13 Geology and Ground Conditions

(Scoping Report section 7.1)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.13.1	Table 7.4 Row 1, Paragraph 7.1.7.2	Damage to coastline and impacts to coastal erosion: construction phase	The Inspectorate considers that insufficient information in relation to the proposed works (specifically HDD) has been provided to support scoping this matter out. The Inspectorate considers that significant effects may arise depending on the location and size of the launch pits, access arrangements and creation of a working area (in particular if engineered structures such as a coffer dam are proposed). The ES should include assess impacts associated with these matters where significant effects could occur. The Inspectorate assessment should take into account the anticipated effects from changes to future coastal erosion rates. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies including the Environment Agency (EA).
4.13.2	Table 7.4 Row 2, Paragraph 7.1.7.3	Damage to geological SSSIs: construction phase	Co2 states that the 'permanent project footprint' will avoid SSSIs where practical. Table 7.4 states that two SSSIs have been identified and Figure 7.2 shows that they are both located within the landfall search area. Other SSSIs are shown on this figure; however these are not identified as designated for their geological interest. Given the further refinements that will be made to the Proposed Development, it is not certain that these sites will be avoided by both the construction works and subsequently the Proposed Development footprint. In addition, it is not apparent that indirect impacts have been considered. In light of the above, the Inspectorate considers impacts to geological SSSIs should be assessed where significant effects are likely to occur.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.13.3	Table 7.4 Row 4, Paragraph 7.1.7.4	Exposure of workers to health impacts: construction phase	In the absence of the further information regarding contaminated land identified as required, uncertainty remains that the mitigation proposed will entirely remove the pathway for effect, as stated in the Scoping Report. The Inspectorate is therefore concerned that there is a risk of significant effects and therefore this matter cannot be scoped out of the ES.
4.13.4	Table 7.4 Row 6, Paragraph 7.1.7.5	Soil compaction: construction phase	Subject to the implementation of the proposed reinstatement, to be in line with DEFRA 2009 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PB13298, to be secured by inclusion in the draft Code of Construction Practice and DCO, the Inspectorate is content that significant effects are unlikely to occur and agrees that this matter can be scoped out of the ES.
4.13.5	Table 7.4 Row 9, Paragraph 7.1.7.8	Accidental spills: construction and operation phase	The Scoping Report proposes that accidental spills during construction and operation will be controlled through implementation of a draft Code of Construction Practice (CoCP) secured in the DCO. The Inspectorate is content that a suitably detailed and drafted CoCP is capable of avoiding likely significant effects in this regard. The Inspectorate agrees that a specific assessment in the ES is not necessary but request that the ES includes appropriate cross reference to the specific measures relied upon the CoCP (or equivalent).
4.13.6	Table 7.4 Row 10, Paragraph 7.1.7.10	Changes to drainage at substation site: operation phase	In the absence of the further information on infiltration rates, and without details of drainage design, it is not possible to conclude that significant effects will not occur at this stage. As such, the Inspectorate considers that this matter cannot be scoped out and an assessment should be made in the ES taking into account the additional baseline data and proposed drainage design.
4.13.7	Table 7.4, Row 12	Decommissioning: all effects along cable route.	The Inspectorate considers that given that the cable will be left in situ it is unlikely that significant effects will arise, and agrees that on the

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			basis of current information this matter can be scoped out of the ES.
4.13.8	Table 7.4	Decommissioning: substation.	The Scoping Report proposes to include assessment of the effects of construction of the substation in the ES. Given that decommissioning impacts are expected to be broadly similar, the Inspectorate considers that effects in relation to the decommissioning of the substation should be assessed and presented in the ES where they have the potential to be significant.

4.14 Hydrology and Flood Risk

(Scoping Report section 7.2)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.14.1	Table 7.7 Row 1 Paragraphs 7.2.4.1 (first bullet) 7.2.7.1 and 7.2.7.2	Increased coastal erosion at the landfall and associated flood risk from the sea: construction phase.	Paragraph 7.2.4.1 of the Scoping Report states the assumption that the landfall will be constructed using HDD. However, Table 7.7 refers to Co1 which does not specifically mention the landfall, undermining confidence in how the embedded mitigation on which the proposed scope is based will be secured. It is also noted that Co1 excludes flood defences and it is not apparent that impacts on these features have been considered. Therefore, the Inspectorate does not agree to scope these matters out of the ES. The Inspectorate has taken into account the consultation response from the EA and advises that as part of the assessment the Applicant should consider the effect future coastal erosion may have on the Proposed Development. The relevant embedded mitigation commitments applied to the ES should be drafted with sufficiently specific wording to make it clear where they apply.
4.14.2	Table 7.7 Row 2 Paragraphs 7.2.7.4	Disturbance of watercourses (reduction of water quality and channel hydro-morphology): cable construction phase.	The Inspectorate notes the caveat of 'where technically practical' in Co1 regarding trenchless techniques and also notes Co34 which sets out the embedded mitigation proposed where open cut construction techniques will be employed. Co80, states that a crossing schedule, to include crossing methodology, will be defined and agreed with the relevant authorities for all watercourses crossed by the Proposed Development. The information in Annex G (Indicative Water Crossings Schedule) is acknowledged. Nevertheless, it is considered that uncertainty remains as to the design and successful implementation of the mitigation proposed and this undermines the confidence that can be placed in them. Accordingly, the Inspectorate cannot scope this matter out and

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			advises that the ES include an assessment of impacts on watercourses where significant effects are likely to occur.
4.14.3	Table 7.7 Row 4 Paragraph 7.2.7.8	Disturbance of minor drainage ditches (reduction of water quality and channel hydro-morphology): cable construction phase	The Inspectorate agrees that if the proposed commitments are successfully implemented, significant effects are unlikely. However, given that uncertainty remains regarding the detail of the embedded mitigation and whether it will or can be achieved at each crossing, the Inspectorate cannot agree to scope this matter out. The Inspectorate advises that the ES should make an assessment of the impacts to minor drainage features where significant effects are likely to occur.
4.14.4	Table 7.7 Row 6, Paragraph 7.2.7.17	Disruption of local land drainage and increased flooding: cable construction phase	It is not clear from the Scoping Report whether the introduction of new, albeit temporary, impermeable areas during construction have been considered with respect to flood risk. The Inspectorate is of the opinion that significant effects may arise in particular with regard to construction compounds and access haul roads. This matter cannot be scoped out of the ES based on the information provided, and therefore the ES should provide an assessment of flood risk associated with construction of the cable corridor.
4.14.5	Table 7.7 Row 7, Paragraph 7.2.7.19	Changes in water quality from mobilisation of soil contaminants: construction phase.	Regarding the mobilisation of sediments and associated effects, provided that the proposed Co25 and Co34, including the commitment to adhere to the EA Pollution Prevention Guidelines are successfully implemented the Inspectorate agrees that significant effects are unlikely. It is agreed that this matter can be scoped out of the ES.
4.14.6	Table 7.7 Row 9	Mobilisation of pollutants (contaminated soil): construction phase.	The matter of other soil contaminants is identified in the Table but not discussed with any justification in the text. With reference to Table 4.13 of this Scoping Opinion, in the absence of detailed information regarding contaminated land, uncertainty remains regarding the baseline and therefore whether the mitigation proposed will entirely

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			remove the pathway for effect (as stated in Section 7.1 of the Scoping Report). As such, the Inspectorate considers that a risk of significant effects exists and advises that this matter cannot be scoped out of the ES in the absence of this information. Appropriate cross reference should be made between the contaminated land and hydrology assessments within the ES.
4.14.7	Table 7.7 Row 10, Paragraph 7.2.7.22	Any effects associated with decommissioning of the cable.	Given that it is understood that the cables will be disconnected ('de-energised with the ends sealed') but left in-situ, the Inspectorate agrees that significant hydrological effects are unlikely to occur. The Inspectorate agrees to scope this matter out of the ES.
4.14.8	Table 7.7 Row 11	Any effects associated with decommissioning of the substation.	The Inspectorate notes the reference in the Scoping Report to mitigation employed during construction and a similar approach to be applied during decommissioning. The comments above regarding construction are also relevant to decommissioning. Furthermore, uncertainty remains regarding the detail of the embedded mitigation and whether it can be achieved, therefore the Inspectorate advises that hydrological and flood risk effects associated with decommissioning of the substation cannot be scoped out of the ES.
4.14.9	Paragraph 7.2.4.1 and 7.2.4.2	All effects associated with the operation phase.	This Scoping Report does not expressly request to scope this matter out. However, the Scoping Report does state that only the impacts during construction need to be considered. The Scoping Report also suggests that 'standard protocols' can be implemented in order to control impacts. The reinstatement works are identified in Co10. The standard protocols referred to in Paragraph 7.2.4.1 should be included in the commitment register and CoCP and appropriately secured in the draft DCO. Given the uncertainty that remains over the nature of these standard protocols and how they will be secured, the Inspectorate does not agree to scope these matters out and the ES should assess

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			the impacts of operation where significant effects could occur.

ID	Ref	Other points	Inspectorate's comments
4.14.10	Table 7.7 Row 5, Paragraph 7.2.7.13	Access track crossing of minor drainage ditches	The Table scopes this matter in for a simple assessment; however the text states that it will be scoped out of the ES. For the avoidance of doubt the Inspectorate requires that the ES includes and assessment of the impacts to minor drainage ditches from access track installations and crossings where significant effects are likely to occur.
4.14.11	N/A	Hydrological and water quality effects on designated sites	This chapter of the Scoping Report makes no reference to the potential impacts from changes to hydrological function and water quality on designated sites. It is acknowledged that ecological and geological designations are proposed to be assessed in relevant other aspect chapters of the ES. However, the Inspectorate considers that these assessments should be informed by suitable hydrological assessment, and appropriate cross reference should be made accordingly within the ES.

4.15 Ecology and Nature Conservation

(Scoping Report section 7.3)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.15.1	Table 7.10 Row 1, Section 7.3.7 and 7.3.8	Direct impacts on designated sites: construction phase.	The Inspectorate notes the caveat of 'where technically practical' in Co1 regarding trenchless techniques and 'where practical/possible' and 'permanent project footprint' in Co2, the commitments on which the scoping assessment is based. The Inspectorate also notes the information on Figures 7.7 and 7.8 which indicates a number of designated sites within the vicinity or overlapping the indicative cable route. It is also acknowledged in the Scoping Report that the Proposed Development will be subject to further refinements, including to the cable route and location of the landfall and substation. It is not clear if the impacts of temporary construction areas are considered against the embedded mitigation. It is also not clear if the word 'degradation' in Table 7.10 includes effects that can arise from indirect impacts, e.g. hydrological changes elsewhere. Uncertainty therefore remains as to the successful avoidance of impacts on designated sites. The Inspectorate considers that a risk of significant effects exists and that this matter should be assessed in the ES. The Inspectorate advises that all potential impacts on designated sites, both direct and indirect, should be assessed in the ES.
4.15.2	Table 7.10 Row 7, Section 7.3.7 and 7.3.8	Impacts on white-clawed crayfish and fish: construction phase.	Given the information regarding baseline conditions regarding white-clawed crayfish and their likely absence from the study area, the Inspectorate agrees that significant effects are unlikely and the Inspectorate agrees that this species can be scoped out of the ES. The assumption that the embedded mitigation measures proposed will avoid impacts on fish is undermined by the uncertainties remaining about the implementation and effectiveness of the mitigation. No

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			baseline data for freshwater fish, including species of conservation interest, is presented in the scoping report. The Inspectorate cannot agree to scope this matter out of the ES and advises that impacts on watercourses should be assessed where significant effects on freshwater fish could occur.
4.15.3	Table 7.10 Row 10, Section 7.3.7 and 7.3.8	Impacts on habitats or species from release of pollutants: construction phase.	With respect to airborne contaminants, given the nature of the impacts which could occur, and provided that the proposed commitments are successfully implemented, the Inspectorate agrees that significant effects are unlikely. Therefore, it is agreed that this matter can be scoped out of the ES. The matter of soil contaminants is discussed at a high level in the Scoping Report with respect to ecological receptors. With reference to Table 4.13 of this Scoping Opinion, in the absence of detailed information regarding contaminated land, uncertainty remains that the mitigation proposed will be as effective as stated. As such, the Inspectorate considers that a risk of significant effects remains and advises that this matter cannot be scoped out of the ES in the absence of this information. Appropriate cross reference should be made between the contaminated land and hydrology assessments within the ES.
4.15.4	Table 7.10 Row 12, Section 7.3.7 and 7.3.8	Impacts on habitats from loss or degradation: cable operation phase.	The Inspectorate is content that significant effects from habitat loss or degradation resulting from the operational cable are unlikely. Therefore, it is agreed that this matter can be scoped out of the ES.
4.15.5	Table 7.10 Row 13, Section	Impacts on protected species from disturbance: cable operation phase.	Given the information in the Scoping Report about the likely nature of operation activities, and considering the nature and low likelihood of the impacts which could occur, the Inspectorate agrees that significant effects are unlikely. Therefore, the Inspectorate agrees that this

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	7.3.7 and 7.3.8		matter can be scoped out of the ES at this stage. It is advisable that the Applicant seek advice with the relevant consultees in order to refine the mitigation measures applied.
4.15.6	Table 7.10 Row 15, Section 7.3.7 and 7.3.8	Impacts on habitats and species from release of pollutants: operation phase.	The Inspectorate considers that release of pollutants during the operation phase is unlikely. The Inspectorate agrees that significant effects are also therefore unlikely and that this matter can be scoped out of the ES.
4.15.7	Table 7.10 Row 16, Section 7.3.7 and 7.3.8	Impacts on habitats from loss or degradation: cable decommissioning phase.	The Inspectorate is content that the decommissioning of cables which it is understood will be disconnected ('de-energised with the ends sealed') but left in-situ is unlikely to result in significant ecological effects. The Inspectorate agrees to scope this matter out of the ES.
4.15.8	Table 7.10 Row 19, Section 7.3.7 and 7.3.8	Impacts on habitats and species from release of pollutants: substation decommissioning phase.	Given that decommissioning impacts are expected to be broadly similar to construction, the Inspectorate considers that effects in relation to the decommissioning of the substation should be assessed and presented in the ES where they have the potential to be significant.

ID	Ref	Other points	Inspectorate's comments
4.15.9	Section 7.3.2 and Table 7.8	Study area – indirect effects on designated sites	The information in Section 7.3.2 and Table 7.8 appears to be contradictory regarding the study area applied to the search for ecological information. The ES should clearly set out the study area which should be based on the predicted extent of impacts.
4.15.10	N/A	Internationally designated sites	The study area applied to the designated site search should be co-ordinated with the approach used in the proposed Habitats

ID	Ref	Other points	Inspectorate's comments
			Regulations Screening Report in the case of internationally designated sites (terrestrial, and coastal/marine in the appropriate ES chapters), and effort should be made to agree with relevant consultation bodies. The ES should assess impacts to internationally designated sites where significant effects are likely.
4.15.11	Table 7.10	Further baseline data requirements/ route planning and site selection (RPSS)	The Inspectorate would expect the habitat surveys undertaken to be fully reported in the ES. It is understood that this information will inform refinements to the RPSS and the Inspectorate advises that this process take into account irreplaceable habitats such as Ancient Woodland and Veteran Trees.

4.16 Landscape and Visual Assessment

(Scoping Report section 7.4)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.16.1	Table 7.13 Row 1 and Row 2, Paragraph 7.4.7.3 Section 7.8	Temporary construction effects and permanent operation effects from offshore elements on onshore landscape and visual receptors.	The location (and need for) the HVAC booster substation is not yet determined, although the current design of the Proposed Development is based on it being sited below or at the horizon (Paragraph 7.4.7.3 of the Scoping Report). Reference is made to a distance of 20km offshore in Section 7.8. However, no parameters have been presented in the Scoping Report for the booster substation location and design. This reduces confidence that significant effects will be avoided, and the Inspectorate expects to see an assessment of the visual impact of the booster substation within the ES incorporating this information. With respect to the other offshore elements, given the anticipated distance of 65km from shore, the Inspectorate agrees that significant temporary and permanent effects are unlikely and agrees to scope these matters out of the ES.
4.16.2	Table 7.13 Row 4	Permanent long-term landscape effects from landfall and cable construction activities: operational phase.	In the absence of information on the extent and nature of landscape features affected by construction of the Proposed Development, and considering the uncertainly regarding the mitigation measures highlighted below, the Inspectorate considers that significant effects could arise and does not agree to scope this matter out of the ES. Regarding mitigation, Table 7.13 only refers to Co25 against this matter. The Inspectorate also notes Co7 which states that woodland and other landscape features will be avoided by construction where possible. The assumption that landscape features removed during construction will be reinstated within one year does not appear within Table 7.12 as embedded mitigation to be included on the commitment register and secured through the DCO or other means. The ES should

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			explain what mitigation has been incorporated into the assessment and how it is to be secured. The assessment should also take into account time taken for replanted hedgerows and woodland features to mature.
4.16.3	Table 7.13 Row 5	Permanent long-term visual effects from landfall and cable construction activities: operational phase.	Given that the landfall and cable will be buried with minimal above ground features comprising access manholes during the operation phase, the Inspectorate agrees that significant effects are unlikely to occur in this regard and agrees to scope this matter out of the ES.
4.16.4	Table 7.13 Row 9	Temporary effects on landscape and viewers: decommissioning phase (all works).	Given the information regarding the construction of the substation site and that potential significant effects have been identified, it is not clear from the information in the Scoping Report how decommissioning works will avoid these effects. A definition of 'short duration' is not provided. The Inspectorate considers that insufficient detail has been provided to allow this matter to be scoped out and advises that an assessment should be made in the ES where significant effects could occur.

ID	Ref	Other points	Inspectorate's comments
4.16.5	Section 7.4.3	Baseline	The assessment should ensure that effects on all relevant receptors are assessed, and the Inspectorate draws the Applicant's attention to comments above in Table 4.11 regarding the Flamborough Headland Heritage Coast. Appropriate cross-reference to the Seascape and Visual assessment should be made in order for a full assessment of effects on this feature to be made.
4.16.6	Paragraph 7.4.3.7	Baseline - viewpoints	The Inspectorate notes the intention to establish representative viewpoints, and advises that effort should be made to reach agreement with relevant consultation bodies.

4.17 Historic Environment

(Scoping Report section 7.5)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.17.1	Table 7.17 Row 1, Paragraph 7.5.7.1	Direct impacts on designated heritage assets: construction phase.	From the information in the Scoping Report and Annex I it remains uncertain that all designated assets have been identified and can be avoided. In light of this, the Inspectorate considers that significant effects could arise, and therefore cannot agree to scope this matter out. Impacts on designated heritage assets must be assessed in the ES where significant impacts could occur. Historic England provide more information in their response regarding further assets within the Scoping Boundary which have not been identified in the Scoping Report.
4.17.2	Table 7.17 Row 7, Paragraph 7.5.7.1	Direct impacts on designated heritage assets: decommissioning phase.	As noted above with respect to the construction phase, it is uncertain if all assets can successfully be avoided, in particular with respect to the substation element of the Proposed Development. The Inspectorate considers that a risk of significant effects remains and cannot agree to scope this matter out at this stage. Therefore an assessment should be made where significant effects could arise.

ID	Ref	Other points	Inspectorate's comments
4.17.3	Paragraph 7.5.4.1, 8th bullet point	Study area – effects on setting	It is not clear from the Scoping Report why the distances of 2.5km for construction and 5km for operation effects on setting have been chosen. The ES should clearly explain the rationale behind the study area applied, with reference to guidance used. The study area should be based on the geographical extent of impacts. The Applicant's attention is drawn to comments from Historic England providing advice with respect to establishing a study area (by the use of a Zone

ID	Ref	Other points	Inspectorate's comments
			of Theoretical Visibility, ZTV) and on appropriate assessment scope and methodology. The Applicant should take this advice into account when establishing the study area to be applied to the assessment.

4.18 Land Use and Agriculture

(Scoping Report section 7.6)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.18.1	Table 7.20 Row 2	Temporary disruption of coastal recreational use: construction phase.	The Scoping report does not provide an accurate estimate of the duration of the construction works which will affect coastal recreational use, however Figure 3.7 indicates works could be ongoing for a month or more in two successive years. It is noted that Co79 intends to deliver mitigation in the form of Public Right of Way (PRoW)/footpath diversions however; the nature and extent of this are not known. Given the scale of the works at the landfall location the Inspectorate considers that significant effects during construction could arise, and considers that the ES should provide an assessment of effects on coastal recreational receptors.
4.18.2	Table 7.20 Row 5	Permanent disruption from reduction of land: operation phase.	The Inspectorate agrees that significant effects from disruption from reduction of land are not likely during the operational phase of the Proposed Development, subject to the implementation of the proposed reinstatement as described in Co10 to be secured by inclusion in the draft Code of Construction Practice and DCO. Therefore it is agreed that this matter can be scoped out of the ES.
4.18.3	Table 7.20 Row 6	Temporary disruption from reduction of land: decommissioning phase.	While it is accepted that the cabling will remain in situ and that relatively minimal areas of land will be affected by decommissioning the above ground structures of the Proposed Development, the Scoping Report does not indicate the duration of the decommissioning phase. The Inspectorate considers that these works may be of sufficient duration to give rise to significant effects, and therefore does not agree that this matter can be scoped out of the ES based on the current information.

4.19 Traffic and Transport

(Scoping Report section 7.7)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.19.1	Table 7.23 Row 1, Paragraph 7.7.7.1	Impact from transport of offshore components on road network: construction phase.	The Scoping Report assumes that all offshore components will be fabricated off-site and stored at a suitable port before being transported to the offshore array. No information is provided regarding potential locations for fabrication and it is not confirmed that this will be at the same facility components will be stored and shipped from. The Inspectorate considers that transport of elements for the Proposed Development should be assessed where significant effects could occur.
4.19.2	Table 7.23 row 5, Table 7.22, Paragraph 7.7.7.2	Impact on driver delay on minor/local roads/parts or roads or uni-directional impact: construction phase.	Given the nature of the impacts which could occur, and provided that the proposed commitments are successfully implemented, the Inspectorate agrees that significant effects are unlikely. It is noted that Table 7.23 refers to Co1 however this relates to HDD crossing of main roads. Co80 relates to the proposed crossing schedule and the Inspectorate has taken this into account. Therefore, it is agreed that this matter can be scoped out of the ES.
4.19.3	Table 7.23 Row 6, Table 7.22, Paragraph 7.7.7.3	Severance: construction phase.	It is noted that Co2 refers to the 'permanent project footprint', therefore it is not clear if temporary areas used for construction will be positioned to avoid sensitive sites. The Inspectorate accepts that given the nature of the likely traffic generation and the impacts which could occur on highly trafficked roads, significant effects during operation are unlikely but this may not be the case for the construction period. The Inspectorate considers that severance impacts during construction should be assessed where significant effects could occur.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.19.4	Table 7.23 Row 10, Paragraph 7.7.7.4	Impacts from traffic generation: operation.	The Inspectorate agrees that traffic generation during operation is not anticipated to result in significant effects and therefore, this matter can be scoped out of the ES.
4.19.5	Table 7.23 Row 11, Paragraph 7.7.7.5	Impacts from traffic generation: decommissioning.	Given the information in the Scoping Report, and provided that the proposed Co127 is successfully implemented, the Inspectorate agrees that significant effects are unlikely. Therefore, it is agreed that this matter can be scoped out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.19.6	7.7.2.2	Study area	The study areas for the issues discussed are only partly defined. The study area applied to the assessment should reflect the extent of anticipated impacts and be informed by baseline information and modelling outputs.
4.19.7	Table 7.21, Figure 7.13	Baseline and potential effects: non-road transport	Table 7.21 list roads identified in the baseline and the text refers to Figure 7.13 for information on cycle routes and PRoW. Other key transport routes e.g. train lines are not discussed although it is noted that Paragraph 7.7.8.3 commits to an assessment of impacts on public transport. The ES should provide a detailed account of the baseline relevant to the assessment, including road, rail, and non-motorised routes. The Inspectorate would expect to see a draft Construction Traffic Management Plan presented in the ES and applied to the assessment of effects on rail and other non-road transport receptors.
4.19.8	Table 7.23	Potential effects: non-motorised routes	Impacts with regard to non-motorised routes are discussed in the Scoping Report under 'Pedestrian delay and amenity'. The ES should make an assessment of the likely significant effects with regard to all non-motorised users.

ID	Ref	Other points	Inspectorate's comments
4.19.9	Paragraph 7.7.4.1, 7.7.6.4, Section 7.7.8	Impacts from traffic generation: construction.	This matter is not listed in Table 7.23 as scoped in or scoped out. The Scoping Report sets out the anticipated increase in traffic movements during construction. For the avoidance of doubt, the Inspectorate considers that traffic generated during construction should be assessed where significant effects are likely to occur.

4.20 Noise and Vibration

(Scoping Report section 7.8)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.20.1	Table 7.25 Row 1, Paragraph 7.8.7.3	Temporary noise and vibration from cable installation (excluding HDD): construction phase.	Given the nature of the impacts which could occur, and provided that the proposed commitments can successfully reduce noise and vibration to below the standard criteria set out in the Scoping Report, the Inspectorate agrees that significant effects are unlikely. Therefore, it is agreed that this matter can be scoped out of the ES. However, please note comment below regarding Co133 and 135.
4.20.2	Table 7.25 Row 5, Paragraph 7.8.7.4	Temporary noise and vibration from haul route access construction: construction phase.	It is not clear how the distance restrictions in Co133 and 135 can practically operate given the estimated working width provided in the Scoping Report. Given the uncertainty that the proposed commitments can successfully reduce noise and vibration to below the standard criteria set out in the Scoping Report, the Inspectorate considers that the ES should assess this matter where significant effects are likely to occur.
4.20.3	Table 7.25 Row 9, Paragraph 7.8.7.7	Noise and vibration from buried cable: operation phase.	Given the nature and low likelihood of the impacts which could occur, and that confidence exists that the proposed commitments can be successfully implemented, the Inspectorate agrees that significant effects are unlikely. Therefore, it is agreed that this matter can be scoped out of the ES.
4.20.4	Table 7.25 Row 10, Paragraph 7.8.7.5	Traffic noise: operation phase.	
4.20.5	Table 7.25 Row 11, Paragraph	Noise and vibration from maintenance activities: operation	

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	7.8.7.5	phase.	
4.20.6	Table 7.25 Row 12, Paragraph 7.8.7.5	Vibration: operation phase	
4.20.7	Table 7.25 Row 13, Paragraph 7.8.7.6 Section 7.8	Noise and vibration from operation of offshore HVAC booster	The location (and need for) the HVAC booster substation is not yet determined, although reference is made to a distance of 20km offshore in Section 7.8. However, no parameters have been presented in the Scoping Report for the booster substation location and design. This reduces confidence that significant effects will be avoided, and the Inspectorate expects to see an assessment of the impacts of the booster substation within the ES incorporating this information.
4.20.8	Table 7.25 Row 14, Paragraph 7.8.7.7	Temporary noise and vibration effects from decommissioning plant along cable route.	Given that the cable will be left in situ and the low level of impacts predicted, along with the measures under Co36 to be implemented, the Inspectorate agrees that significant effects are unlikely. Therefore, it is agreed that this matter can be scoped out of the ES.

ID	Ref	Other points	Inspectorate's comments
4.20.9	Paragraph 7.8.3.1	Baseline	The description in the Scoping Report lacks detail and does not highlight the settlements and other receptors identified in other topic chapters which may be relevant to the noise and vibration assessment. The Inspectorate would expect to see a robust baseline comprising a description of all potential receptors identified by the study area reported in the ES.

4.21 Air Quality and Health

(Scoping Report section 7.9)

ID	Ref	Applicant's proposed aspect to scoped out	Inspectorate's comments
4.21.1	Table 7.27, Row 1	Dust generation: Construction Phase	The Inspectorate notes that no information about the likely dust generation during the construction phase is provided. The likely receptors affected the scoping report concludes a negligible magnitude of effect but does not provide any basis for this conclusion. It is not clear from the Scoping Report how receptors have been identified. Furthermore, there is no calculation of how study areas were defined and no sources are determined to support the definition of 500m and 200m boundaries. These are also not determined in figure 7.15 and therefore sensitive receptors within these boundaries cannot be clearly identified. Therefore the Inspectorate does not agree to scope this issue out of the ES. The ES should assess impacts from dust generation during construction where significant effects are likely.
4.21.2	Table 7.27, Row 2	Dust generation and exhaust emissions from traffic: All phases	The Scoping Report does not provide evidence to demonstrate an absence of sensitive receptors within the 200m buffer of access roads. The Scoping Report does state (paragraph 7.9.4.4) that there will be low traffic movements such that do not meet the thresholds defined by IAQM. However, there is no evidence provided to support this statement and there are no current definitive estimates of vehicle movements during construction, operation and decommissioning. Whilst the Inspectorate notes the reliance on embedded mitigation measures and the corresponding commitments in Annex B, it cannot agree to scope this issue out at this stage in the absence of justification for determining sensitive receptor locations and the lack of data or justified estimations on vehicular movement through all phases of development.

ID	Ref	Applicant's proposed aspect to scoped out	Inspectorate's comments
4.21.3	Table 7.27, Row 3	Emissions from facilities: Operational phase	The Inspectorate agrees that considering the nature and characteristics of the Proposed Development significant effects are unlikely and this matter can be scoped out.
4.21.4	Table 7.27, Row 4	Dust generation: Decommissioning phase	The Inspectorate notes that the Scoping Report states in paragraph 3.6.1.3 that the decommissioning phase will be the reverse of the construction phase with similar numbers of vehicles. Since the Inspectorate has not agreed to scope out dust generation during the construction phase as specified in 4.21.1 above, the Inspectorate cannot agree to scope this matter. The ES should assess impacts from dust generation during decommissioning where significant effects are likely.

ID	Ref	Other points	Inspectorate's comments
4.21.5	Paragraph 7.9.2.1 and 7.9.4.3	Study area	The Inspectorate notes that a 500m study area has been determined to assess potential significant effects with regard to dust as derived from the Institute of Air Quality Management (IAQM) guidance and Design Manual for Roads and Bridges (DMRB). Sensitive receptors are only considered within 350m as specified in 7.9.4.3 which is not consistent with the previously determined study area. The ES must be consistent and clearly state and justify the study area applied based on the anticipated extent of impacts.

4.22 Socio-Economic Characteristics

(Scoping Report section 7.10)

ID	Ref	Applicant's proposed matters to scoped out	Inspectorate's comments
4.22.1	Paragraph 7.10.1.1	Employment and economic benefit derived from decommissioning	The Inspectorate agrees that this matter can be scoped out considering the nature and characteristics of the Proposed Development and the inability to undertake any meaningful assessment of employment, goods and services in the distant future.

4.23 Cumulative Effects

(Scoping Report section 8)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4.23.1	Paragraph 8.1.1.5	Cumulative effects during decommissioning	Decommissioning is not proposed to be addressed in the cumulative assessment on the basis that it is too far in the future for enough information to be available to form a robust assessment. The Inspectorate notes the intention to assess this phase of the Proposed Development and to commit to a decommissioning plan at the relevant time, and is content with this approach. The Inspectorate agrees to scope cumulative effects during decommissioning out of the cumulative assessment; however, the Applicant should take into account comments in Section 3, Paragraph 2.3.11 of this Scoping Opinion.
4.23.2	Table 8.1 Row 2	Cumulative flood risk at onshore substation	It is not clear from the information presented whether cumulative effects will inform the proposed drainage design. The Inspectorate advises that the drainage design presented in the ES should take into account the potential cumulative flood risk impact.
4.23.3	Table 8.1, Row 4	Cumulative visual effects: onshore construction	While it is appreciated that these effects will be temporary, given the large scale of the Proposed Development and other developments identified in Section 8 the Inspectorate considers that significant effects could occur if developments fall within the same area and in the same temporal extent. The ES should assess cumulative impacts to visual receptors from onshore construction where significant effects are likely.
4.23.4	Table 8.1 Row 6	Cumulative land and agriculture effects: onshore construction	While it is appreciated that these effects will be temporary, given the large scale of the Proposed Development and other developments identified in Section 8 the Inspectorate considers that significant effects could occur if developments affect the same geographical area

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			and in temporal extent. This might be when impacts are sequential or overlapping. The Inspectorate would expect to see an assessment in the ES where significant effects could occur.

ID	Ref	Other points	Inspectorate's comments
4.23.5	Section 8.3	Cumulative effects on offshore environment	The proposed cumulative effects assessment does not include any detail of what aspects of the offshore environment will be assessed, however it is noted that the approach set out will examine effects on a receptor basis as part of the refinement of the list of projects/plans to be considered. The ES should explain fully the results of this process and set out what aspects and receptors have been assessed. Specific comments are provided in Tables 4.4, 4.11 and 4.12 above with regard to those environmental aspects. The Inspectorate notes the intention to follow the advice in Advice Note 17.
4.23.6	Table 8.1, Paragraph 8.4.3.2	ZOIs for cumulative assessment	The Zones of Influence (ZoI) for the cumulative assessment differ from the environmental aspect chapter for some aspects. It is noted that some principles behind the ZoI are given in Paragraph 8.4.3.2 and the Inspectorate would expect the ES to clearly explain how the ZoI or study area(s) have been determined, based on the likely extent of impacts.

5. INFORMATION SOURCES

5.0.1 The Inspectorate's National Infrastructure Planning website includes links to a range of advice regarding the making of applications and environmental procedures, these include:

- Pre-application prospectus[3]
- Planning Inspectorate advice notes[4]:
  - Advice Note Three: EIA Notification and Consultation;
  - Advice Note Four: Section 52: Obtaining information about interests in land (Planning Act 2008);
  - Advice Note Five: Section 53: Rights of Entry (Planning Act 2008);
  - Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements;
  - Advice Note Nine: Using the 'Rochdale Envelope';
  - Advice Note Ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects (includes discussion of Evidence Plan process);
  - Advice Note Twelve: Transboundary Impacts;
  - Advice Note Seventeen: Cumulative Effects Assessment; and
  - Advice Note Eighteen: The Water Framework Directive.

5.0.2 Applicants are also advised to review the list of information required to be submitted within an application for Development as set out in The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009.

[3] The Planning Inspectorate's pre-application services for applicants. Available from: https://infrastructure.planninginspectorate.gov.uk/application-process/pre-application-service-for-applicants/

[4] The Planning Inspectorate's series of advice notes in relation to the Planning Act 2008 process. Available from: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

TABLE A1: PRESCRIBED CONSULTATION BODIES[5]

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Health and Safety Executive	Health and Safety Executive
The National Health Service Commissioning Board	NHS England
The relevant Clinical Commissioning Group	NHS East Riding of Yorkshire CCG
Natural England	Natural England
Natural England (Offshore Wind Farms)	Natural England (Offshore Wind Farms)
The Historic Buildings and Monuments Commission for England	Historic England - Yorkshire Office
The Historic Buildings and Monuments Commission for England (OFFSHORE ONLY)	Historic England
The relevant fire and rescue authority	Humberside Fire and Rescue
The relevant police and crime commissioner	Office of the Police and Crime Commissioner for Humberside
The relevant parish council(s) or, where the application relates to land [in] Wales or Scotland, the relevant community council	Rowley Parish Council
	Walkington Parish Council
	Bishop Burton Parish Council
	Cherry Burton Parish Council
	Watton Town Council
	Hutton Cranswick Parish Council

[5] Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the 'APFP Regulations')

SCHEDULE 1 DESCRIPTION	ORGANISATION
	Nafferton Parish Council
	Harpham Parish Council
	Burton Agnes Parish Council
	Skerne and Wansford Parish Council
	Foston Parish Council
	Skipsea Parish Council
	Lockington Parish Council
	Beswick Parish Council
	Skidby Parish Council
	Cottingham Parish Council
	Molescroft Parish Council
	Woodmansey Parish Council
	Beverley Town Council
	Etton Parish Council
	Leconfield Parish Council
	North Frodingham Parish Council
	Beeford Parish Council
	Ulrome Parish Council
	Carnaby Parish Council
	Barmston and Fraisthorpe Parish Council
The Environment Agency	The Environment Agency - Yorkshire Office
The Joint Nature Conservation Committee	Joint Nature Conservation Committee
The Maritime and Coastguard Agency	Maritime & Coastguard Agency
The Maritime and Coastguard Agency -	The Humber Maritime and Coastguard

SCHEDULE 1 DESCRIPTION	ORGANISATION
Regional Office	Agency
The Marine Management Organisation	Marine Management Organisation (MMO)
The Civil Aviation Authority	Civil Aviation Authority
The Relevant Highways Authority	Hull City Council
	East Riding of Yorkshire Council
	Scarborough Borough Council
The relevant strategic highways company	Highways England - Yorkshire and North East
The Coal Authority	The Coal Authority
The relevant internal drainage board	Beverley and North Holderness Internal Drainage Board
Trinity House	Trinity House
Public Health England, an executive agency of the Department of Health	Public Health England

TABLE A2: RELEVANT STATUTORY UNDERTAKERS[6]

STATUTORY UNDERTAKER	ORGANISATION
The Crown Estate Commissioners	The Crown Estate
The Forestry Commission	Forestry Commission - Yorkshire and the North East
The Secretary of State for Defence	Ministry of Defence
The relevant Clinical Commissioning Group	NHS East Riding of Yorkshire Clinical Commissioning Group
The National Health Service	NHS England

[6] 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008 (PA2008)

STATUTORY UNDERTAKER	ORGANISATION
Commissioning Board	
The relevant NHS Trust	Yorkshire and Humber Ambulance Service NHS Trust
Railways	Network Rail Infrastructure Ltd
	Highways England Historical Railways Estate
Dock and Harbour authority	Bridlington Piers and Harbour Commissioners
Pier	Bridlington Piers and Harbour Commissioners
Lighthouse	Trinity House
Civil Aviation Authority	Civil Aviation Authority
Licence Holder (Chapter 1 Of Part 1 Of Transport Act 2000)	NATS En-Route Safeguarding
Universal Service Provider	Royal Mail Group
Homes and Communities Agency	Homes England
The relevant Environment Agency	Environment Agency - Yorkshire
The relevant water and sewage undertaker	Yorkshire Water
The relevant public gas transporter	Cadent Gas Limited
	Energetics Gas Limited
	Energy Assets Pipelines Limited
	ES Pipelines Ltd
	ESP Connections Ltd
	ESP Networks Ltd
	ESP Pipelines Ltd
	Fulcrum Pipelines Limited
	GTC Pipelines Limited

STATUTORY UNDERTAKER	ORGANISATION
	Harlaxton Gas Networks Limited
	Independent Pipelines Limited
	Indigo Pipelines Limited
	Murphy Gas Networks limited
	Quadrant Pipelines Limited
	National Grid Gas Plc
	Scotland Gas Networks Plc
	Southern Gas Networks Plc
	Northern Gas Networks Limited
The relevant electricity generator with CPO Powers	Westermost Rough Limited
	Vi Aura Limited
	VPI Immingham LLP
	Thorpe Marsh Power Limited
	Tetragen Holdings Limited
	Triton Knoll Offshore Windfarm Limited
	SSE Generation Limited
	Saltend Cogeneration Company Limited
	Optimus Wind Limited
	Heron Wind Limited
	E.ON UK Plc
	E.ON Climate and Renewables UK Humber Wind Limited
	DONG Energy Humber Renewables Limited
	Centrica SHB Limited
	Centrica KPS Limited

STATUTORY UNDERTAKER	ORGANISATION
	Breesea Limited
	C.Gen Killingholme Limited
	Sargas Power Yorkshire Limited
The relevant electricity distributor with CPO Powers	Eclipse Power Network
	Energetics Electricity Limited
	Energy Assets Networks Limited
	Energy Assets Power Networks Limited
	ESP Electricity Limited
	Fulcrum Electricity Assets Limited
	G2 Energy IDNO Limited
	Harlaxton Energy Networks Limited
	Independent Power Networks Limited
	Leep Electricity Networks Limited
	Murphy Power Distribution Limited
	The Electricity Network Company Limited
	UK Power Distribution Limited
	Utility Assets Limited
	Vattenfall Networks Limited
	Utility Distribution Networks Limited
	Northern Powergrid (Northeast) Limited
	Northern Powergrid (Yorkshire) plc
The relevant electricity transmitter with CPO Powers	Humber Gateway OFTO Limited
	National Grid Electricity Transmission Plc
	TC Westermost Rough OFTO Limited

TABLE A3: SECTION 43 CONSULTEES (FOR THE PURPOSES OF SECTION 42(1)(B))[7]

LOCAL AUTHORITY[8]
Hull City Council
East Riding of Yorkshire Council
North Yorkshire County Council
Doncaster Metropolitan Borough Council
City of York Council
North Lincolnshire Council
Ryedale District
Selby District Council
Scarborough Borough Council
Marine Management Organisation (MMO)

TABLE A4: NON-PRESCRIBED CONSULTATION BODIES

ORGANISATION
Office of the Police and Crime Commissioner for Humberside
Humberside Fire and Rescue
Yorkshire and Humber Ambulance Service NHS Trust
Royal National Lifeboat Institution

[7] Sections 43 and 42(B) of the PA2008

[8] As defined in Section 43(3) of the PA2008

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

Consultation bodies who replied by the statutory deadline:

Beverley Town Council
Doncaster Council
Environment Agency
Forestry Commission
Harlaxton Energy Networks
Harlaxton Gas Networks
Health and Safety Executive
Historic England
Marine Management Organisation
Maritime and Coastguard Agency
Ministry of Defence
National Air Traffic Services
National Grid
Natural England
Network Rail
NHS East Riding of Yorkshire Clinical Commissioning Group
The Coal Authority
Trinity House

From: Deputy Clerk [mailto:deputy.clerk@beverley.gov.uk]
Sent: 07 November 2018 12:06
To: Hornsea Project Four
Subject:

Your Ref: EN010098-00019

Good Afternoon

Following a meeting of the Town Council on the 6th November, Beverley Town Council have no comments to make in connection with the proposed development of Hornsea Project Four Offshore Wind Farm.

Regards

Carol

Carol Oliver (Ms)
Deputy Town Clerk
Beverley Town Council
12 Well Lane
Beverley
HU17 9BL
01482 874096
Please note the Town Council opening hours to the public are Tuesday, Wednesday and Thursday from 10am to 1pm

From: Stent, Gareth [redacted]
Sent: 19 October 2018 08:55
To: Hornsea Project Four
Subject: Hornsea Project Four Offshore Wind Farm (the Proposed

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11
Application by Orsted (the Applicant) for an Order granting Development Consent for the Hornsea Project Four Offshore Wind Farm (the Proposed Development)
Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Doncaster MBC has no comments

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The Planning Inspectorate Major Casework Directorate		**Our ref:** **Your ref:**	RA/2018/139278/01-L01 EN010098-000019
Via email: HornseaProjectFour@pins.gsi.gov.uk		**Date:**	13 November 2018

Dear Sir/Madam,

HORNSEA PROJECT FOUR OFFSHORE WIND FARM SCOPING OPINION

Thank you for your consultation on this scoping opinion request, which we received on 16 October 2018. We have reviewed the 'Environmental Impact Assessment: Scoping Report' by Ørsted, dated 8 October 2018, and have the following advice:

Offshore Effects

Geomorphology

We agree with the decision, given in Section 4.4 of the report, to avoid both Marine Conservation Zones (MCZs) and to limit the landfall search area to the north of these protected areas, but consideration should be given to the potential for some degree of smothering, due to works in the Export Cable Corridor. Depending on the tidal state, there may be the capacity for some fine suspended sediment to be deposited within these sites.

Overall, the processes identified in subsection 6.1.3.2 to be considered are agreeable. However, there is no mention of near shore processes within the landfall search area. Furthermore, with regards to the modelling, Table 6-1 states that no further modelling will be completed. When considering cumulative impacts on the wave climate, all Hornsea project areas should be included, if they haven't currently.

The near shore seabed data in Table 6-1 is fairly old (2014) and should be reconsidered, with thought given to the current validity of these data given that this is quite an active coastline.

Marine Ecology

Given the close proximity to the Holderness MCZ, we recommend that a sediment management plan is put in place to reduce the potential for smothering benthic habitats.

Sediment sampling within the footprint of the cable path is also recommended, which would allow for mitigation for the potential release of Environmental Quality Substances, if they are present.

Fish

Piling activities may affect salmonoid fish returning to the Humber estuary, so appropriate mitigation should be in place for this activity.

Onshore Effects

Hydrogeology

We use a tiered approach to groundwater protection. At the moment, there are three levels of Source Protection Zone (SPZ), with SPZ1 being the most sensitive. At this stage, it is not clear which SPZ the development falls into. It looks, from the figures included in the report, that parts of the area south of Beverley might fall within SPZ2, or even SPZ1, but this should be clarified in the Environmental Statement (ES).

We generally do not permit developments within 50 metres of any spring, well or borehole. However, not all of these groundwater sources have designated SPZs around them. The EIA should use data from ourselves and East Riding of Yorkshire Council to make sure that no groundwater supply sources are disturbed by this development.

Crossing rivers and other watercourses might obstruct groundwater flow. We will only agree to proposals that could obstruct groundwater flow where mitigation measures can be agreed. There must be not be an unacceptable change in groundwater levels or flow due to the proposal. The ES will therefore need to include mitigation measures for any change to groundwater flow in the superficial deposits due to construction.

Since January 2018, dewatering groundwater for construction projects is now a activity permitted by the Environment Agency. Depending on the quantities, the excavations may require one or multiple permits for abstracting and discharging groundwater during the excavation phases. We recommend that the ES includes a section for the effects of dewatering on groundwater resources.

We agree with the scoping in of impacts in Table 7-4 from dewatering activities from piling and construction of the substation and the thermal impacts on groundwater. These are the main activities that could pose a risk to groundwater resources and the magnitude of their impact is unknown at this stage.

Flood Risk

In terms of flood risk and coastal erosion, the report appears to be thorough. However, we have the following advice in this regard.

Landfall

1. The area appears to sit within the Shoreline Management Plan Policy Unit C. The current policy in that unit is ‘No Active Intervention.’ The landfall element should therefore consider the impact of future coastal erosion on infrastructure in this

area. We would also advise that the applicant engages with East Riding of Yorkshire Council to obtain the most recent coastal erosion rates and projections.
2. Barmston Drain, designated as a 'main river', sits at the very southern extent of the landfall scoping area. If there are any works proposed within 20 metres of that watercourse then we would like to see further details to enable us to provide additional advice in relation to any flood risk activity permit requirements.
3. A number of other ordinary watercourses exist within the landfall areas shown on Figure 4-2 and any works affecting these watercourses should be discussed with the Internal Drainage Board or Lead Local Flood Authority.

Onshore – Permanent Works

1. We would welcome clarity on the vulnerability classification of the development. If mixed vulnerabilities, we would recommend considering flood risk in its component parts. For any component that is considered to be 'essential infrastructure', it must be designed to remain operational and safe in times of flood, as per Table 3 of the Planning Practice Guidance: Flood Risk and Coastal Change.
2. A sequential approach to the location of any permanent buildings should be considered. In terms of flood risk, areas of Flood Zone 1 should be considered preferable. Figure 4-3 identifies the search area for the substation, which includes areas of Flood Zone 1, 2 and 3.
3. A flood risk assessment is required for any works within areas at risk, according to our Flood Map for Planning, showing how the development can be made safe without increasing flood risk elsewhere. This will need to consider location, layout and flood mitigation for any permanent buildings, taking into account appropriate allowances for climate change.
4. The FRA will also need to assess sources of flood risk, other than that from rivers and the sea. The search area for the substation includes areas at risk from surface water (pluvial) flooding and areas that have been subject to historic flooding.
5. The cable routing and substation search areas cross a number of modelled flood catchments. The FRA should explore the appropriateness of those models, particularly where flood sensitive or critical infrastructure may be located.
6. Environmental permits covering flood risk activities relating to the permanent works are likely to be required and may be parallel tracked. There should be no permanent works within 8 metres of any main river within the substation search area.

Onshore – Temporary Works

1. There are seven 'main river' crossings, with the indicative crossing points included in Annex G of the Scoping Report. Horizontal Directional Drilling (HDD), a trenchless technique, will be adopted for all 'main river' crossings which we support in principle.
2. Where there are raised flood defences or natural high ground adjacent to the main rivers, we will require further details (e.g. location of the reception pits).
3. Where there are raised flood defences / embankments, the applicant will need to ensure that their works do not increase flood risk or damage the integrity of the flood defences. Damage may occur as a result of construction works causing settlement, damaging footings, or vibration caused by equipment or machinery. Depending on the exact location, we may request conditions for monitoring the integrity of the flood defences during and/or on completion of works.
4. Temporary works in, over, under or within 8 metres of any 'main river' are likely

to require an environmental permit for flood risk activities. Where flood defences are present, this also applies for work affecting the integrity or access to the flood defence, or within 8metres of the landward toe of the flood defence. On any 'main river' within the tidally influenced reach of the watercourse, this distance increases to 16 metres from the watercourse or landward toe of the flood defence. We would highlight that it may be possible for some crossings to obtain an Exemption FRA3 (further information here). Proposals covered by a Development Consent Order can seek to avoid the need to obtain an environmental permit by bringing those elements into the DCO application.

5. The location of temporary access / haulage roads and stockpiling areas needs to be included in respect of flood risk. Consideration should be given to the impact of these roads on flood storage and conveyance in the floodplain, and also impact on regulators' access to maintain, inspect and operate flood assets.

The following advice relates specifically to the scoping questions for consultees within this section:

Q1. With reference to the methodology for crossing watercourses, there may still be a risk of the works affecting flow in the watercourses, or de-stabilisation of the flood defences, which may be adjacent or remote from the watercourses. The document appears to show that the methodology has been selected to minimise these risks, but we will need to review each crossing more specifically to provide guidance on each location.

Q2. The Water Framework Directive (WFD) applies to all surface water bodies, including rivers, streams, lakes, canals and estuaries, coastal waters and all groundwater bodies. It is stated within Table 7-9 that "where HDD technologies are not required or practical, the crossing of drainage ditches may be undertaken by open cut methods and / or the installation of temporary culverts or bridges to allow water to continue flowing." The proposed development therefore has the potential to impact on some water bodies and some assessment must therefore be undertaken to demonstrate that the proposal will not cause deterioration of water bodies or prevent WFD objectives being achieved. Further advice on WFD is given at the end of this letter.

Q3. This question should be directed to the Lead Local Flood Authority (LLFA) - East Riding of Yorkshire Council. However, if there is any intention to dispose of surface water to a 'main river' then we would expect to be invited to comment on the proposed discharge rate and to provide a view on whether an environmental permit would be likely to be granted.

Q4. In terms of flood risk, the trenchless technique for any 'main rivers' appears the most sensible.

Q6. This question should be directed to the LLFA, with regard to their Flood Asset Register and any other local information they hold. Consideration should also be given to any areas of land that may require safeguarding for current or future flood risk operational reasons. Again, this information should be discussed / requested from the LLFA.

Q7. This information would be included within the datasets that the applicant appears to have used. It may also be worth considering coastal assets where flood risk may serve a secondary purpose, e.g. within the urban settlements the frontages are largely categorised as coastal assets for addressing coastal erosion, but do serve a coastal

Cont/d..

flood risk function.

Cumulative Effects

We agree with the methodology for the offshore Cumulative Effects Assessment (CEA) and look forward to seeing the offshore CEA within the Preliminary Environmental Information Report and ES.

Water Framework Directive

Section 5.5.1.2 states that “A full scoping assessment for all elements identified for the Yorkshire South coastal water body and bathing waters within 2 km of the Hornsea Four offshore ECC scoping boundary will be presented in the PEIR as part of the Stage 2 assessment.” We wish to highlight that the Yorkshire South Coastal waterbody is a highly modified waterbody and mitigation measures are classified as moderate/less. Appropriate mitigation should be considered as part of development if there are any physical modifications within this waterbody planned during the development.

We trust this advice is useful.

Yours sincerely

Miss Lizzie Griffiths
Sustainable Places - Planning Specialist

Direct dial 020 302 58439
Direct e-mail lizzie.griffiths@environment-agency.gov.uk

Cc Ørsted

End

Yorkshire & North East
Foss House
Kings Pool
1-2 Peasholme Green
York
YO1 7PX

Tel 0300 067 4900

yorkshirenortheast@forestry.gsi.gov.uk
Area Director
Crispin Thorn

Date: 13th November 2018
Our ref: YNE/I&R/Statutory/2018
Your ref: EN010098-000019

Gail Boyle
Senior EIA and Land Rights Adviser
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol, BS1 6PN

BY EMAIL ONLY

Dear Ms Boyle,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11

Application by Orsted (the Applicant) for an Order granting Development Consent for the Hornsea Project Four Offshore Wind Farm (the Proposed Development)

Location: Yorkshire Coast – Beverley, Landfall and Onshore Section of the Hornsea Project Four Offshore Wind Farm Proposal

Thank you for seeking our advice on the scope of the Environmental Statement (ES) in your consultation dated 16th October 2018.

The Forestry Commission is the Government experts on forestry & woodland and a statutory consultee (as defined by Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009)[1] for major infrastructure (Nationally Significant Infrastructure Projects (NSIPS)) that are likely to affect the protection or expansion of forests and woodlands (Planning Act 2008).

[1] http://www.legislation.gov.uk/uksi/2009/2264/contents/made

The Forestry Commission's responsibility is to discharge its consultee roles as efficiently, effectively and professionally as possible, based on the forestry principles set out in the The UK Forestry Standard (4th edition published 2017). **Page 23** "Areas of woodland are material considerations in the planning process and may be protected in local authority Area Plans. These plans pay particular attention to woods listed on the Ancient Woodland Inventory and areas identified as Sites of Local Nature Conservation Importance (SLNCIs).

As highlighted in the National Planning Policy Framework: *Irreplaceable habitats including ancient woodland and veteran trees* section of the National Policy Statement National Networks (NPSNN): National Planning Policy Framework (published July 2018).

Paragraph 175 – "*development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists*".

The Forestry Commission has also prepared joint standing advice with Natural England on ancient woodland and veteran trees which we refer you to as it notes that ancient woodland is an irreplaceable habitat, and that, in planning decisions, Plantations on Ancient Woodland Sites (PAWS) should be treated equally in terms of the protection afforded to ancient woodland. It highlights the Ancient Woodland Inventory as a way to find out if woodland is ancient.

We have reviewed the Environmental Impact Assessment: Scoping Report in particular section seven Environmental Topics and Potential Effects Onshore. We do note that in reference to Ancient Woodland in this section the scoping report only refers to : "Where practical the following sensitive sites (inclusive of Ancient Woodland) will be avoided by the permanent project footprint" without specific reference to mitigation or compensation for potential impact on ancient woodland. Also throughout the scoping report there appears to be no mention of Ancient Woodland or Veteran Trees being ***"Irreplaceable Habitats"*** as per the National Planning Policy Framework. If there isn't any ancient woodland impacted we would expect this to be referenced.

Figure 4.3 – shows Ancient Woodland but no other woodland we would like to see all woodland assessed for value and impact, and to be considered within mitigation/compensation provisions to avoid net deforestation of the project.

Figure 4.4 – includes 'priority habitat – deciduous woodland' – as above, we would like to consider all woodland as part of the Environment Statement.

Table 7.8 – we recommend the inclusion of the National Forest Inventory in this mapping: National Forest Inventory - Forest Research. There does appear to be some woodland related Countryside Stewardship grant-funded activity across the project area, we would like to understand all woodland related impact within the possible project footprint.

Page 387 – refers to discussions with Natural England in relation to impacts on habitats during the operational phase and these being scoped out – would be useful to understand the content of those discussions and why this was scoped out?

Table 7.13 page 403 states that the landscape effects are 'negligible' and not likely to be significant with woodlands assumed to be replanted within 5 yrs – however this doesn't account for the additional time needed for planted trees to reach maturity. We recommend a mitigation or compensation strategy of any potential impact on Ancient Woodland should be included in the Environment Statement. We also suggest that a United Kingdom Forestry Standard approved management plan is required, to ensure long term viability of any potential created habitat by the proposed development. This is particularly the

case for woodlands created as compensation for loss of ancient woodland, especially those with translocated soil from ancient woodland sites.

We have no further comments at this stage of the process.

If you wish to consult us further in relation to the Environmental Statement with the Forestry Commission please contact the Yorkshire and North East Office at the above address.

Yours sincerely

Jim Smith
Local Partnership Adviser

From: Karen Thorpe [redacted]
Sent: 18 October 2018 12:44
To: Hornsea Project Four
Subject: Hornsea Project Four Offshore Wind Farm

Good morning,

Thank you for sending the relevant information and material regarding the Hornsea Project Four Offshore Wind Farm.

Harlaxton Energy Networks Ltd. at this time has no assets in the area, and will not be implementing any in the near future, therefore Harlaxton has no comment to make on this project.

Kind Regards

Karen Thorpe
Distribution Administration Assistant
0844 800 1813

Visit our website harlaxtonenergynetworks.co.uk and explore at your leisure

Harlaxton
Energy Networks Limited

Toll Bar Road, Marston, Grantham, Lincolnshire, NG32 2HT
Registered Company Number : 7330883

From: Karen Thorpe [redacted]
Sent: 18 October 2018 12:47
To: Hornsea Project Four
Subject: Hornsea Project Four Offshore Wind Farm

Good afternoon,

Thank you for sending the relevant information and material regarding the Hornsea Project Four Offshore Wind Farm.

Harlaxton Gas Networks Ltd. at this time has no assets in the area, and will not be implementing any in the near future, therefore Harlaxton has no comment to make on this project.

Kind Regards

Karen Thorpe
Distribution Administration Assistant
0844 800 1813

Harlaxton
Gas Networks Limited
Toll Bar Road, Marston, Grantham, Lincs, NG32 2HT

HSE

Health and Safety Executive

CEMHD Policy - Land Use Planning
NSIP Consultations
Building 1.2, Redgrave Court
Merton Road, Bootle
Merseyside, L20 7HS

Your ref: ENO10098
Our ref: 4.2.1.6511

HSE email: NSIP.applications@hse.gov.uk

FAO Gail Boyle
The Planning Inspectorate
Temple Quay House
Temple Quay,
Bristol
BS1 6PN

Dear Ms Boyle

09 November 2018

PROPOSED HORNSEA PROJECT FOUR OFFSHORE WINDFARM (the project)
PROPOSAL BY ORSTED HORNSEA PROJECT FOUR LTD (the applicant)
INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (as amended) – Regulations 10 and 11

Thank you for your letter of 16th October 2018 regarding the information to be provided in an environmental statement relating to the Hornsea Project Four Offshore Windfarm.

HSE does not comment on EIA Scoping Reports but the following information is likely to be useful to the applicant.

HSE's land use planning advice

Will the proposed development fall within any of HSE's consultation distances?

According to HSE's records there are five major accident hazard pipelines within the proposed development boundary of the Hornsea Project Four Offshore Windfarm:

Major accident hazard pipelines:

1. HSE ref 7727, operated by National Grid PLC; 6 feeder Burton Agnes/ Pavill
2. HSE ref 8422; operated by Northern Gas Networks; Wawne / Elloughton
3. HSE ref 14134, operated by National Grid PLC; 29 feeder Ganstead to Assel by pipeline
4. HSE ref 7719; operated by Northern Gas Networks; Burton Agnes (west) / Wawne
5. HSE ref 9669; operated by Ineos Manufacturing (Hull) Ltd; Teeside to Saltend ethylene pipeline

HSE's Land Use Planning advice would be dependent on the location of areas where public may be present and so it is possible that HSE may advise against this proposal. When we are consulted further by the Applicant with further information, under Section 42 of the Planning Act 2008, we can update our advice.

Hazardous Substance Consent

The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) will probably require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) Regulations 2015 as amended.

Hazardous Substances Consent would be required to store or use any of the Named Hazardous Substances or Categories of Substances at or above the controlled quantities set out in schedule 1 of these Regulations.

Further information on HSC should be sought from the relevant Hazardous Substances Authority.

Consideration of risk assessments

Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role on NSIPs is summarised in the following Advice Note 11 Annex on the Planning Inspectorate's website - Annex G – The Health and Safety Executive . This document includes consideration of risk assessments on page 3.

Explosives sites

The Explosives Inspectorate has no comment to make as the nearest licensed explosive site boundary is approximately 650m from the closest point on the substation search area. As the separation distances for the site are contained within the site boundary, we cannot see any reason why this would be a problem.

Please send any further electronic communication on this project directly to the HSE's designated e-mail account for NSIP applications. Alternatively, any hard copy correspondence should be sent to:

Mr Dave Adams (MHPD)
NSIP Consultations
1.2 Redgrave Court
Merton Road
Bootle, Merseyside
L20 7HS

Yours sincerely,

[redacted]

Dave Adams
CEMHD4 Policy

Historic England

YORKSHIRE OFFICE

Ms Gail Boyle
Planning Inspectorate - Major Casework Directorate
Temple Quay House
2 The Square
Bristol
BS1 6PN

[redacted]

Our ref: PL00492442

12 November 2018

Dear Ms Boyle

Re: Planning Act 2008 (as amended) and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) - Regulations 10 and 11.

Application by Orsted (the applicant) for an Order granting Development Consent for the Hornsea Project Four Offshore Wind Farm (the Proposed Development).

Scoping consultation and notification.

Thank you for your letter of 16th October 2018 consulting Historic England about the above EIA Scoping Report.

While Historic England broadly welcomes measures to mitigate and adapt to the effects of climate change, we are aware that such developments have the potential to harm the significance of heritage assets and their settings. With this in mind Historic England has drawn up guidance for planners and developers on climate change and renewable energy technologies, including *Wind Energy and the Historic Environment* available at www.helm.org.uk <http://www.helm.org.uk>.

To assist in the implementation of national planning policy Historic England has produced guidance on managing change within the settings of heritage assets. The guidance offers a framework for the consideration of setting, applicable to designated and non-designated heritage assets, and for assessing the implications of development affecting the setting of a heritage asset. It provides the principal Historic England advice on the issue of setting and should be used in conjunction with other relevant guidance.

Our initial review indicates that the proposed development could, potentially, have an impact upon designated heritage assets and their settings in the area. In line with the National Planning Policy Framework (NPPF, paragraph 189), we would expect the Environmental Statement to describe the significance of any heritage assets affected,

including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and sufficient to understand the potential impact of the proposal on their significance.

We would draw your attention, in particular, to the following designated heritage assets:

Scheduled Monuments: Risby Hall

Listed Buildings: Risby Hall

Registered Parks and Gardens: Risby Hall

We recommend you contact the local authority Historic Environment Record for further information on designated heritage assets, and including the relevant local authority(s) for the location of conservation areas.

We reiterate that this is **not** an exhaustive list and other Heritage assets may also be identified as part of the assessment process which would require appropriate consideration. In particular, we would expect the assessment to clearly demonstrate that the extent of the proposed study area is of the appropriate size to ensure that all heritage assets likely to be affected by this development have been included and can be properly assessed. Methodologies that can help to inform the extent of the study area include a Visual Impact Assessment and the production of a Zone of Theoretical Visibility (ZTV) in line with current guidance. The ZTV of the proposed development should initially be based on topographical data before the impact of existing trees and buildings etc. on lines of sight is assessed.

Given the height of the structures associated with the proposed development at the southern end of the service prove connection and the surrounding landscape character, this development is likely to be visible across a large area and could, as a result, affect the significance of heritage assets at some distance from this site itself.

Consideration should be given to undertaking a practical exercise with either a crane or balloons erected at the height of the proposed structures so that all parties are to better able to understand the landscape impact of the roposals. We have been engaged in other major developments where this technique has been used and it greatly assisted the identification of the key issues and impacts from which the resulting EIA was able to focus its assessment.

We would also expect the Environmental Statement to consider the potential impacts which the proposals might have upon those heritage assets which are not designated. The NPPF defines a heritage asset as "a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in

planning decisions, because of its heritage interest". This includes designated heritage assets and assets identified by the local planning authority (including local listing). This information is available via the local authority Historic Environment Record (www.heritagegateway.org.uk <http://www.heritagegateway.org.uk>) and relevant local authority staff.

We recommend that you involve the Conservation Officer of the East Riding of Yorkshire Council and the archaeological staff at Humber Archaeology Partnership, Hull in the development of this assessment. They are best placed to advise on: local historic environment issues and priorities; how the proposal can be tailored to avoid and minimise potential adverse impacts on the historic environment; the nature and design of any required mitigation measures; and opportunities for securing wider benefits for the future conservation and management of heritage assets.

In general terms, Historic England advises that a number of considerations will need to be taken into account when proposals for wind energy are assessed. This includes consideration of the impact of ancillary infrastructure, such as tracks and grid connections:

- Direct impacts on heritage assets (buildings, monuments, sites, places, areas, landscapes), whether designated or not.
- Impacts on the settings of heritage assets since elements of setting can contribute to the significance of a heritage asset. An assessment of the impact on setting will be proportionate to the significance of the asset and the degree to which the proposed changes enhance or detract from its significance and the ability to appreciate the asset. In the consideration of setting a variety of views may make a contribution to significance to varying degrees. These can include long-distance views as well as the inter-visibility between heritage assets or between heritage assets and natural features. For further advice see *The Setting of Heritage Assets*.
- The potential for archaeological remains.
- Effects on landscape amenity from public and private land.
- The cumulative impacts of the proposal.

The assessment should also take account of the potential impact which associated activities (such as construction, servicing and maintenance, and associated traffic) might have upon perceptions, understanding and appreciation of the heritage assets in the area. The assessment should also consider, where appropriate, the likelihood of alterations to drainage patterns that might lead to in situ decomposition or destruction of below ground archaeological remains and deposits, and can also lead to subsidence of buildings and monuments.

It is important that the assessment is designed to ensure that all impacts are fully understood. Section drawings and techniques such as photomontages are a useful part of this.

The proposal includes both On Shore and Off Shore components, and we offer the following comments on this basis:

Off Shore:

Historic England does not accept the conclusions of the submitted EIA Scoping Report for this proposed development.

We note that Ørsted Hornsea Project Four Ltd is proposing to locate a maximum 180 wind turbine generators approximately 65km east of the East Riding of Yorkshire, with an area covered by the Agreement for Lease of 846km². We further acknowledge that the initial desk-based assessment outline in Section 6.7 'Marine Archaeology' correctly identifies through the data sources, as set out in Table 6-27 'Key sources of marine archaeology data for Hornsea Four' that there is great potential within the area for maritime, aviation and prehistoric archaeological receptors.

In addition to this it should be noted that a number of key studies (such as the North Sea Palaeolandscapes Project and the Lost Frontiers Project) have identified the potential for palaeoenvironmental data with buried deposits and in situ prehistoric remains across the North Sea. Such deposits, if located, would be of national and possibly international significance, with the potential to significantly add to our current knowledge of Pleistocene and Quaternary sedimentary sequences and hominid habitation.

Furthermore, it should also be noted that whilst Section 6.7 references the recorded wrecks within the development area, it does not consider the potential represented by the casualties and recorded losses within the National Record of the Historic Environment (NRHE) for both shipwreck and aircraft losses.

For instance, there are 2791 casualties recorded in the NRHE off the coast of North Yorkshire alone, with a further 235 recorded off North Lincolnshire. Of these records, 3 are for aircraft. The scarcity of finds in general should not be taken as evidence of low archaeological potential. Besides the discrepancies between numbers for documented events (casualties) and sites, which show significant archaeological potential, there has also been historic under-reporting of wreck and other archaeological evidence, with historic finds cast back into the sea even into recent times (and some finds are inherently dangerous, e.g. munitions).

From these records, the area can generally be characterised by evidence of human migration, trade, fishing activity and war. These losses therefore represent a significant chapter of our maritime history from the Mesolithic to present day. This is especially critical given the likelihood of older wrecks to be less well presented within geophysical datasets, due to the degradation of wooden wrecks over time. Older, and therefore

rarer and more significant wrecks, can be currently unknown and only represented in the available datasets as a series of shallow relief anomalies on the seabed, if at all.

Equally, aviation losses since the invention of flight are likely to be represented by ephemeral remains or artefact scatters, due to the nature of the construction of early planes and the manner in which they are lost. Few have been accurately positioned on the seabed, so in conjunction with the number of losses over this area of the sea there is high potential for aviation remains to be discovered.

A key characteristic of archaeological receptors is their inability to tolerate change, and therefore any impacts to such receptors would be of high significance. Due to the scale and nature of the proposed development, and the considerable potential for both known and unknown archaeological receptors within the development area, the impacts from the proposed works would be highly significance if not correctly mitigated.
It is therefore crucial for this mitigation to be developed through the planning process and in consultation with Historic England, to adequately address the impacts from the proposed works in line with the relevant UK policy and legislation.

From what we understand from the submitted Scoping Report, this entire process is to be omitted. We therefore question the ability for any mitigation measures that are developed post-consent to be robust in their nature, in the absence of the regulatory procedures to drive their production.

As a consequence, we do not agree with the conclusions of the Scoping Report, as referenced above. Whilst we acknowledge that in theory the proposed embedded mitigation measures may be sufficient to act as mitigation for known sites of archaeological interest, the Scoping Report has not demonstrated the location of all sites present within the development area.

Therefore, we are unable to provide advice on the suitability of the mitigation measures, until a full assessment of the area has been completed inclusive of desk-based resources and site specific geophysical and geotechnical data, and the location of sites of archaeological interest are known.

Additionally, there is no detail presented within Chapter 8 ‘Cumulative Effects’ in regards to the topics proposed for inclusion within the offshore cumulative effects assessment. In particular, we require further detail to be included in regards to the cumulative impact of the project on palaeoenvironmental deposits across the area. The Humber Regional Characterisation study (Tappin et al., 2011) and numerous projects including the North Sea Palaeolandscapes Project (Gaffney et al., 2007) and the Lost Frontiers (on-going) project demonstrate that the North Sea has a recognisable and widespread palaeoenvironmental interest. Historic England wish to encourage further research within this area in the future, and as such the cumulative

impacts of 21st century infrastructure needs to be considered including details provisions for the suitable mitigation measures, for instance through co-ordinated survey work.

We look forward to further engagement with the developer so that full attention can be given to the historic environment within the preparation of any EIA Environmental Statement and accompanying Evidence Plan process.

The submitted documentation poses a number of specific questions in relation to Marine Archaeology, which we list below with our replies:

1. **Do you agree that all of the known marine archaeological receptors within the zone of influence have been identified and considered?**
In the absence of a full and detailed assessment of both desk-based sources and site specific geophysical and geotechnical survey data, we are unable to provide advice on this question.

2. **Do you agree that all relevant sources of secondary data have been accessed for scoping or identified for use in the EIA?**
We acknowledge that Table 6-27 'Key sources of marine archaeology data for Hornsea Four' provides an adequate list of data sources for the initial desk-based assessment. However, this list is not exhaustive and therefore we do not agree that all relevant sources of secondary data have been accessed or identified. In particular, there is a lack of reference to the 'Lost Frontiers' project currently being undertaken lead by University of Bradford, as well as any reference to either the finds and discoveries reported under the Offshore Renewables Protocol for Archaeological Discoveries or the Marine Aggregate Industry Protocol for the Reporting of Finds of Archaeological Interest.

3. Do you agree that analysis of limited geophysical data swaths provides a sound basis for the purposes of characterisation of marine archaeology and the establishment of the range of likely significant effects; given that full analysis of specific impacts will be under-taken post-consent through full archaeological review?
We note the detail presented within paragraphs 6.7.3.18-20 regarding the coverage of the geophysical surveys undertaken to date, specifically using line spacing of between 714m and 3km for main line of data collection. Surveys conducted on such a line spacing do not represent full coverage over the geographical area that they cover. Therefore, only a broad-scale characterisation of the marine historic environment can be afforded by such surveys.
Whilst we agree that such a broad-scale characterisation would assist in preliminary discussions of the likely impacts from a proposed development, we do not agreed that it would provide a sound basis for establishing the range of likely significant effects, in particular in terms of the scale of impact to an area. As detailed in our response

above, there is a significant potential for maritime, aviation and prehistoric archaeology within the project area. The limited geophysical data as described in the Scoping Report would not allow for a realistic quantification and qualification of the archaeological receptors as presently understood due to the scarcity of the data. Consequently, this would impact the perceived scale of the development, with the potential to underplay the scale and nature of the marine historic environment within the area.

4. Is there any other baseline information that you feel should be considered?

Please see our response to question 2 above for a list of additional studies that should be used in any EIA Environmental Statement for this proposed development, and suggested references below:

References:

Tappin, D.R.; Pearce, B.; Fitch, S.; Dove, D.; Gearey, B.; Hill, J.M.; Chambers, C.; Bates, R.; Pinnion, J.; Diaz Doce, D.; Green, M.; Gallyot, J.; Georgiou, L.; Brutto, D.; Marzialetti, S.; Hopla, E.; Ramsay, E.; Fielding, H.. 2011 The Humber Regional Environmental Characterisation. Marine Aggregate Levy Sustainability Fund.

Gaffney V., Thomson K. and Fitch S. (Eds.) 2007. Mapping Doggerland: The Mesolithic Landscapes of the Southern North Sea. Archaeopress. Oxford.

On Shore:

Historic England is generally content with this aspect of the proposed development and considers that the provisions made in the Historic Environment section of the supporting documentation (Section 7.5) are appropriate.

The submitted documentation poses a number of specific questions in relation to Terrestrial Archaeology, which we list below with our replies:

1. Do you agree that the approach and method described are appropriate for assessment of potential impacts and effects on designated and non-designated heritage assets resulting from Hornsea Four?

No. A greater amount of archaeological evaluation will be required. See 5) below.

2. Do you agree that all designated and non-designated heritage assets within the scoping boundary have been identified?

No. The presence of World War One and World War Two archaeology (specifically anti-invasion remains) is poorly represented in the HER and is likely to survive in greater quantity than is currently anticipated.

The potential for undiscovered, nationally important Mesolithic archaeological deposits is high for the coastal area.

The East Riding of Yorkshire is under-represented by archaeological designations, but we are content to understand that many of those known undesignated deposits and remains are nationally important. The Yorkshire Wolds is a major focus of activity in the prehistoric period and a landscape comparable to that of Avebury/Stonehenge. There are more Neolithic cursus monuments on the Yorkshire Wolds than there are in Avebury, but none are designated.

Similarly recent research has indicated that large areas of the Vale of Holderness are covered by deposits of medieval and modern 'warp' material. The implication of this is that extensive prehistoric land surfaces are likely to remain intact and could be at risk from interventions associated with the insertion of cabling.

3. Which of the identified non-designated and designated assets within the scoping boundary are most likely to experience a change in significance as a result of changes in their setting?

Risby Hall (Scheduled Monument, Listed Building and Registered Park and Garden) is most at risk from harm to its setting and significance through the erection of large buildings associated with the development. As the answer to 2) above identifies that not all non-designated heritage assets are likely to have been identified there is scope that non-designated heritage assets may suffer change in significance as a result of changes in their setting.

The impact of changes in hydrology, which may then have an impact on the significance of designated and non-designated heritage assets has not been given an appropriate level of assessment.

4. **Do you agree that all relevant sources of secondary data have been accessed for scoping or identified for use in the EIA?**

No. It would be of benefit to the project that contact was made with Professor Nicky Milner, University of York to discuss the potential for Mesolithic period remains along the route, and to contact Dr Jim Leary, University of Reading, Skipsea Project to discuss the presence of warp deposits along the cable route.

5 **Do you agree that analysis of high resolution aerial imagery (aerial transcription) together with non-invasive survey is sufficient to contribute to a characterisation of both known buried archaeology (where necessary) and unknown buried archaeology in areas identified through walkover survey?**

No. A greater amount of archaeological evaluation will be required to 'ground truth' the geophysical survey results.

If you have any queries about any of the above, or would like to discuss anything further, please contact me.

Yours sincerely,

[redacted]

Keith Emerick
Ancient Monuments Inspector
Keith.Emerick@HistoricEngland.org.uk

cc: Lucie McCarthy, Principal archaeologist, Humber Archaeology Partnership
Chris Pater, Historic England.
David King, Orsted.

Marine Management Organisation

Marine Licensing
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

T +44 (0)300 123 1032
F +44 (0)191 376 2681
www.gov.uk/mmo

Gail Boyle
The Planning Inspectorate

(By email only)

13 November 2018

Dear Ms Boyle,

RE: Application by Orsted (the Applicant) for an Order granting Development Consent for Hornsea Project Four Offshore Wind Farm (the Proposed Development). Scoping consultation and opinion.

Thank you for your scoping opinion request dated 16 October 2018 and for providing the Marine Management Organisation (MMO) with the opportunity to comment on the Hornsea Project Four Offshore Wind Farm scoping request.

Please find attached the scoping opinion of the MMO. In providing these comments, the MMO has sought the views of our technical advisors at the Centre for Environment, Fisheries and Aquaculture Science (Cefas).

If you require any further information, please do not hesitate to contact me using the details provided below.

Yours sincerely

Emma Toogood
Marine Licensing Case Officer

[redacted]

Marine Management Organisation

Scoping Opinion

Title: Hornsea Project Four Offshore Wind Farm

Applicant: Ørsted Hornsea Project Four Limited

MMO Reference: DCO/2018/00014

Contents

Marine Management Organisation

1. Proposal

Hornsea Project Four is a proposed offshore wind farm (OWF) including up to 180 wind turbine generators and will include all associated offshore and onshore infrastructure. The Hornsea Four array area is approximately 846 square kilometres and is located in the North Sea, approximately 65km off the East Riding of Yorkshire coast within the Hornsea Round 3 zone. Hornsea Project Four proposes a generating capacity of greater than 100MW and therefore is a Nationally Significant Infrastructure Project (NSIP). As such, there is a requirement to submit an application for Development Consent to the Planning Inspectorate (PINS).

2. Scoping Opinion

The applicant has prepared a scoping report entitled *'Hornsea 4 Environmental Impact Assessment: Scoping Report',* which has been submitted to the Marine Management Organisation (MMO) via PINS.

The MMO agrees with the topics outlined in the report and in addition recommends that the following aspects are considered further during the assessment process and should be included in any subsequent Environmental Impact Assessment (EIA).

3. General Comments

3.1 The MMO notes that UXO clearance will not be included in the application at this stage, however a high-level assessment will be provided on the basis of assumptions about the expected level of risk. A detailed assessment of UXO clearance will be developed for a separate marine licence at a later stage. The MMO considers that this is a reasonable approach.

3.2 The scoping report states that operations and maintenance (O&M) activities for Hornsea Project Four will be finalised once the onshore base location and technical specification are known. The MMO recommends that full consideration is given to the potential impacts of O&M activities in the ES. Further detail should be provided in the ES on the scope of O&M activities, including the types of activity expected to occur, i.e. repair or replacement of components, the frequency of works and the extent of potential impacts on receptors.

3.3 The MMO acknowledges that the applicant has identified cable protection as one of the key characteristics of the project. Details within the Rochdale Envelope should include potential types of cable protection and proposed methods of installation and the maximum percentages of both export and array cables which may potentially require protection. In addition the maximum volumes and footprints of cable protection proposed should be included in the Rochdale Envelope.

4. Marine Geology, Oceanography and Coastal Processes

4.1 The MMO agrees that the sediment transport pathways can be scoped out in the offshore area. However due to the sensitivities of the Holderness coastline, which is rapidly eroding in some places, they should be scoped in from Smithic Bank inshore to the mean high water spring tide (MHWS) level.

4.2 The MMO agrees that the process of scouring around structures can be scoped out. However the inclusion of the laying of scour protection measures, including particle size, type, shape and timings of installation, should be scoped in.

5. Subsea Noise

5.1 Chapter 6.2, paragraph 6.2.2.3 states that potential impacts during the O&M phase, particularly from operational turbine noise and maintenance vessel noise, will not be assessed further within the EIA. However there is currently little justification to support this conclusion. The reason given is that "this aspect has been considered on recent offshore wind farm EIAs and not found to have a significant impact. There are no substantial developments to the design of Hornsea Four that would be likely to lead to a significant increase in noise during turbine operation". The scoping of operational noise is further discussed in relation to fish ecology and marine mammals in Section 6.4.7.12 and Sections 6.5.7.4 to 6.5.7.6 respectively.

5.2 Whilst the MMO agree that evidence from previous developments suggests that operational noise is unlikely to have a significant impact on marine receptors, most of the empirical data is from short-term studies in relatively small-scale OWFs, and conclusions may change when information accumulates from larger OWFs (Bergström *et al.*, 2014). Data from larger wind turbines is currently limited. This is important given that offshore wind turbines have increased, and are increasing, in size and scale. Further justification should be provided to give some specific examples of recent offshore wind farm EIAs (including Hornsea Project Three) and how they are applicable to Hornsea Project Four, particularly in terms of turbine size and environmental parameters.

5.3 Section 6.4.7.23 states that mortality, injury, behavioural changes and auditory masking arising from noise and vibration during the decommissioning phase are proposed to be scoped out of the assessment. The MMO acknowledges that the decommissioning phase is potentially decades away and a detailed assessment at this stage may not be necessary or appropriate. However, as the decommissioning phase approaches, it is recommend that potential impacts including underwater noise, are appropriately considered and assessed for fish and shellfish. The report states that "Noise generated during decommissioning… For all species, it considered that there is no risk of likely significant effect and it is proposed that this impact be scoped out of the EIA". There may be a low risk of likely significant effect, the statement that there is no risk is not supported by scientific evidence.

5.4 The MMO disagrees with the proposal to scope out Temporary Threshold Shift (TTS) during construction, O&M and decommissioning for marine mammals. The potential impact of risks to marine mammals including injury (both temporary and

permanent) and disturbance needs to be considered in order to ensure any decision is based on the most robust evidence. Although TTS is by definition temporary, it is not known what the consequences of a temporary cognitive impairment, or indeed repeated temporary cognitive impairment, will be for an animal. As noted in our previous statement, the characteristics of TTS are distinct from behavioural disturbance, in which an animal changes its behaviour in response to a stimulus. There is no cognitive impairment implicit in behavioural responses.

5.5 The MMO notes the proposals of soft start procedures to minimise the potential impacts of noise on sensitive receptors and that a Marine Mammal Mitigation Protocol (MMMP) will also outline monitoring and mitigation measures. A UXO specific MMMP will be implemented during UXO clearance using Acoustic Deterrent Devices (ADDs), marine mammal observers and scare charges as primary mitigation measures alongside other measures agreed with Statutory Nature Conservation Bodies (SNCBs) and the MMO. The MMO acknowledges that these are the standard measures typically proposed for OWF developments and support that a MMMP for both piling and UXO clearance will be implemented.

5.6 The most direct and comprehensive way to mitigate the risk of acoustic impact on marine species is to reduce the amount of noise pollution emitted at source. For pile driving, there are now noise reduction technologies available, such as big bubble curtains and acoustic barriers that are integrated into the piling rig (e.g. IHC Noise Mitigation System), which are being routinely deployed in German waters. Such source mitigation should be considered as a primary means of reducing the potential acoustic impact of pile driving operations.

5.7 When assessing the potential impacts of underwater noise in the Southern North Sea cSAC, the MMO recommends the consideration of current JNCC guidance outlining a potential threshold approach to the assessment, and subsequent management, of noise disturbance in the harbour porpoise cSACs (JNCC, 2017).

5.8 The MMO wish to make the applicant aware that at the time a marine licence is submitted for UXO activities, an application should also be submitted for a European Protected Species licence to undertake the works.

6. Benthic and Intertidal Ecology

6.1 The MMO notes that all impacts relevant to benthic ecology have been scoped out, however there is currently insufficient evidence in terms of site specific data to scope all impacts out at this stage.

6.2 Site specific particle size data is required for assessing sandeel preferred habitat and coastal processes impacts with regard to seabed levelling and suspended sediment impacts and will also be necessary to inform mitigation commitment Co83 outlined in Table 6.6.

6.3 Site-specific information on habitats and species is required to provide confidence in the assessments. Currently information is lacking from the majority of the export cable route and western part of the array. It is still unknown what the long-term effects of large OWFs are on benthic communities and habitats due to both the

relative infancy of Round Three developments and lack of post-construction monitoring data from these OWFs.

6.4 There is currently insufficient information on the introduction or spread of invasive non-native species due to the presence of subsea infrastructure and vessel movements due to a lack of post construction monitoring data to date.

6.5 The MMO agree that the impacts in relation to noise, accidental release of pollutants and indirect disturbance from electromagnetic fields (EMFs) generated by cables to benthic communities can be scoped out based on the available literature and the mitigation proposed.

6.6 The MMO considers the approach to the scoping assessment and data gathering is appropriate, however where data is absent, information from European Marine Observation and Data Network (EMODnet) has been used to infill data gaps. Whilst this gives an indication of the possible European Nature Information System EUNIS habitats present, it may not represent the actual habitats present and reduces confidence in the final assessments.

6.7 The MMO notes that data from the western part of the Array area and the majority of the cable route are absent, therefore further survey effort will be required to ensure confidence in the predictions made within the ES. EMODnet data has been used to fill gaps, however inconsistencies have been identified between the predicted habitats and site-specific data collected within the Project area. Discrepancies between EMODnet predicted habitats and site-specific data collected for the Dogger Bank Creyke Beck OWF cable corridor (where they coincide with the current project) are also apparent.

6.8 Data collected for Hornsea One and Two, along with the Humber Regional Environmental Characterisation survey have been selected to provide a regional assessment, although none overlap with the Hornsea Four Array or cable route and therefore are not relevant for the characterisation of the Project.

6.9 The MMO considers that the majority of embedded mitigation measures proposed in Table 6.6 are appropriate. However, Co84 states that 'foundations and cable routes will be micro-sited around qualifying sensitive habitat features (subject to agreement with the MMO) to an extent not resulting in a hazard for marine traffic and Search & Rescue capability. Presence of sensitive habitats will be identified through a review of the latest available benthic datasets and pre-construction surveys.' Clarification should be provided about what proposals are intended to avoid sensitive habitats if no site-specific data exists for the majority of the export cable and western part of the array, as outlined in comment 7.8.

6.10 Section 6.3.3.9 discusses the potential impacts of sediment contamination and Table 6.5 displays sediment samples collected in relation to the Dogger Bank Creyke Beck cable corridor which coincides with the inshore section of Hornsea Project Four's proposed cable corridor. The MMO would expect the PEIR and subsequent ES to contain a figure showing where these samples were collected; the results per sample and methods for analysis to ensure the results are compatible with Cefas Action Levels. This should also include the dates of collection and analysis to ensure results are in line with OSPAR guidelines. The applicant

should note that the number of samples will be influenced by the amount of material to be disturbed, therefore this should also be provided to allow an assessment to be carried out.

6.11 Site-specific sediment contaminant data is required from within the export cable route and Array area as currently these data are only available for the inshore area of the export cable route. These data should also be presented as specific values (units) and compared to OSPAR background levels. In addition, sediment contaminant data from five stations sampled for the Dogger Bank Creyke Back OWF cable corridor, which coincide with an inshore section of the Hornsea Four cable corridor, have been used as evidence for scoping out of further assessment. Further samples should be taken along the export cable corridor and within the Array area for sediment contaminant analysis to support this conclusion.

7. Fish and Shellfish Ecology

7.1 The MMO considers that the approach to the scoping assessment and data gathering is generally appropriate. However it is important that the data presented to inform the EIA acknowledges survey limitations. This should include survey methods, timings and the limitations of survey and gear types including whether selected gear types will adequately target all species. For example, a 2m epibenthic beam trawl will not adequately target large/adult fish, or pelagic fish. Please also note, Table 6.8 describes the 2m epibenthic beam trawl as having a 5m codend. Please clarify whether this should be a 5mm codend. Additionally, certain fish species that live 'tight' to the seabed e.g. sole may not be adequately targeted by an otter trawl and are better targeted using a commercial beam trawl. Thus, some species may not be proportionally represented by the trawl survey data.

7.2 Neither otter trawls nor epibenthic beam trawls will adequately target sandeels. This limitation should be considered in relation to point 6.4.3.7 of the scoping report; '*The greater sandeel (Hyperlopus lanceolatus) and lesser sandeel (Ammodytidae spp.), (both keystone species as they are important prey items for fish, birds and marine mammals) were recorded during the surveys but generally at low abundances (and at less than 25% frequency)'.*

7.3 The MMO notes that figures 6-16 to 6-20 present the spawning and nursery grounds of key species alongside Hornsea trawl abundance data recorded during site specific surveys. It is recommended that in the ES, spawning and nursery ground maps are presented separately from trawl catch data. This is because the presence of a particular species in the catch isn't necessarily an indication that the species is using that area as a spawning or nursery ground.

7.4 For the reasons outlined above, the MMO consider that the data resulting from fishing methods cannot be used to accurately describe species abundance. It is recommended that trawl catch data should be presented in standardised units, for example Catch Per Unit Effort (CPUE).

7.5 Information on the assessment of impacts to migratory fish is limited in the scoping report. Potential impacts from construction and operational activities should be adequately assessed in relation to migratory fish transiting the area to/from the river

Humber. The Environment Agency carry out fisheries surveys to monitor coastal and transitional waters, including the river Humber. Data can be downloaded via; https://data.gov.uk/dataset/41308817-191b-459d-aa39-788f74c76623/trac-fish-counts-for-all-species-for-all-estuaries-and-all-years

7.6 The MMO agree with the identification of herring and sandeel as the key marine species which may be vulnerable to the impacts of the construction and operation of Hornsea Project Four.

7.7 As discussed in comment 7.7, benthic data in the western section of the array area and most of the cable corridor are absent. As a result, the MMO do not consider it possible to conduct a robust analysis of potential herring spawning or sandeel habitat due to the lack of Particle Size Analysis (PSA) data for this area.

7.8 Section 6.4.3.7 states that a low abundance of sandeel was recorded during surveys for Hornsea Project One, Hornsea Project Two and Creyke Beck OWFs. However this low abundance is likely to be the result of an incorrect gear type. In order to target sandeel, a dedicated sandeel dredge survey would be required. This should be highlighted in this section.

7.9 It is recommended that an assessment of sandeel habitat suitability is undertaken as part of the EIA. This should use particle size analysis (PSA) data from grab samples collected within the array and export cable corridor areas, and the assessment carried out using the method described in Latto *et al.* (2013). Any catches of sandeel observed in grabs will provide anecdotal evidence of their presence in the array and export cable route areas.

7.10 The MMO considers that potential cumulative impacts to sandeel should be adequately assessed. This is due to the large areas of the Southern North Sea which are already being utilised by marine developments including OWFs and aggregate extraction. The current approach to EIAs is to assume that as the Southern North Sea is a large area, any impacts are unlikely to be significant. However it is important to consider that many areas of the wider Southern North Sea are not suitable habitat due to the physical characteristics of the area. Therefore, additional development may further reduce availability of sandeel habitat.

7.11 With regards to herring spawning grounds, the MMO considers that amendments are required to paragraph 6.4.3.13:

I. The MMO agree that the area around Flamborough Head is currently considered the main active herring spawning ground based on International Herring Larvae Survey (IHLS) data. However, the ES should acknowledge that herring spawning grounds can be recolonised over time (Corten,1999), and that herring will return to a broad area to spawn annually, but the exact locations change year on year.

II. The trawling methods used for surveys in the former Hornsea Zone (2m epibenthic trawl and otter trawl) do not adequately target pelagic species, which would account for low catches of herring. In addition, trawling locations in the former Hornsea zone did not extend as far as Flamborough Head.

III. Whilst limited surveys were carried out near Flamborough Head for Creyke Beck OWF, the fishing methods used (beam trawl and trammel nets), do not

target pelagic species. These limitations should be acknowledged in respect of the last sentence of this paragraph.

7.12 Table 6-10 lists the spawning and nursery areas of fish species in the vicinity of the HOW04 array area and offshore EEC. The MMO does not agree that the herring spawning ground in the vicinity of Hornsea Project Four should be described as Low Intensity (partial). The data sources used to inform this conclusion have omitted IHLS data which indicate high intensity (total larvae of >69,000.1 per m^2) along the export cable route. The intensity for herring spawning ground in the vicinity of HOW04 should be amended to 'High'.

7.13 The MMO recommend that a species-specific assessment of potential spawning habitat is undertaken as part of the EIA, using the method described in MarineSpace (2013). The assessment should be supported by 10 years of IHLS data.

7.14 Due to the location of Hornsea Project Four in relation to herring spawning grounds and sandeel habitat, the MMO do not currently agree that some of these impacts should be scoped out at this stage. Our comments are provided in Table 1 below, which has been adapted from Table 6.12 of the report.

Table 1 – MMO's comments on impacts scoped in/out of further assessment

Project Activity and Impact	**Scoped out/ Scoped in**	**Cefas: Agree/ Disagree**
Construction phase: Direct damage (e.g. crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from construction activities.	**Scoped out**	**Agree - sufficient justification provided.**
Construction phase: Temporary localised increases in SSC and smothering.	**Scoped out**	**Disagree – Reason:** Increases in SSC and smothering resulting from construction activities e.g. cable laying using trenching, jetting techniques have the potential to impact on herring. Herring are benthic spawners that require a specific substrate on which to spawn, consisting of gravel and similar habitats (e.g. coarse sand, maerl, shells) where there is a low proportion of fine sediment and well-oxygenated water (Rogers 2000). Herring eggs and larvae can be put at risk if the spawning beds are smothered e.g. from dredging activity. If there is a large proportion of fine material *(<63* micron) in the substrate, then it is unlikely to allow sufficient water circulation and it will not be suitable as a herring spawning ground (Rogers 2000). It is important to manage herring spawning areas by ensuring that the physical properties of the substrate remain the same.
Construction phase: Mortality, injury, behavioural changes and auditory masking arising from noise and vibration.	**Scoped In**	**Agree - Reason:** Underwater noise and vibration during the construction phases to be **scoped in.** **Additional comments:** Fish hearing capabilities are to be assessed using the four groups described in Popper *et. al* (2014).

		This is appropriate. Please note: For the underwater noise assessment, eggs and larvae should be assessed as a stationary receptor.
Construction phase: Accidental pollution events during the construction phase resulting in potential effects on fish and shellfish receptors.	**Scoped Out**	**Agree - sufficient justification provided.**
Operational phase: Long-term loss of habitat due to the presence of turbine foundations, scour protection and cable protection.	**Scoped out**	**Disagree – Reason:** The loss of herring spawning habitat due to the presence of turbine foundations, scour protection and cable protection in areas of herring spawning ground. This is of particular concern along the export cable corridor which crosses the main spawning ground of Flamborough head.
Operational phase: Increased hard substrate and structural complexity as a result of the introduction of turbine foundations, scour protection and cable protection.	**Scoped out**	**Disagree – Reason:** As above, this will result in alteration/loss of herring spawning habitat.
Operational phase: Underwater noise as a result of operational turbines.	**Scoped out**	**Disagree – Reason:** Due to the combined size of the all Hornsea OWF sites and increasing WTG sizes, the MMO have some concerns over behavioural responses e.g. to spawning herring during the operational phase. It is recommend that additional supporting evidence is provided, such as underwater noise modelling or monitoring of large OWFs.
Operational phase: EMF effects arising from cables.	**Scoped out**	**Agree - sufficient justification provided.**
Operational phase: Direct disturbance resulting from maintenance during operation.	**Scoped out**	**Agree - sufficient justification provided.**
Operational phase: Indirect disturbance resulting from the accidental release of pollutants.	**Scoped out**	**Agree - sufficient justification provided.**
Decommissioning phase: Direct damage (e.g. crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from decommissioning activities.	**Scoped out**	**Agree - sufficient justification provided.**
Decommissioning phase: Temporary localised increases in SSC and smothering.	**Scoped out**	**Disagree – Reason:** As per the construction phase, increases in SSC and smothering resulting from construction activities e.g. cable laying using trenching, jetting techniques have the potential to impact on herring spawning grounds. This should be scoped in for assessment at the decommissioning phase.
Decommissioning phase: Mortality, injury, behavioural changes and auditory masking arising from noise and vibration.	**Scoped out**	**Disagree - Reason:** Underwater noise and vibration during the decommissioning phase to be scoped in for the same reasons that they are scoped in for the construction phase. **Additional comments:** Little information is presented on the noise levels that will be generated from decommissioning activities. The MMO is unaware of any underwater noise monitoring/study that has been carried out

		during the decommissioning phase for an OWF, it would be useful for further justification to be provided to support scoping out underwater noise impacts to fish during this phase.
Decommissioning phase: Accidental pollution events during the construction phase resulting in potential effects on fish and shellfish receptors.	**Scoped out**	**Agree - sufficient justification provided.**

8. Conclusion

8.1 The topics addressed in this scoping opinion should be assessed during the EIA process and outcomes documented in the EIA report submitted in support of any subsequent application. However, this scoping opinion should not be viewed as a definitive list of all ES (and HRA) requirements. Given the nature and scale of the proposed works, other work may prove necessary.

References

Bergström L, Kautsky L, Malm T, Rosenberg R, Wahlberg M, Astrand Capetillo N & Wilhelmsson D, 2014, *Effects of offshore wind farms on marine wildlife – a generalised impact assessment,* Environmental Research Letters, 9 034012

Corten A, 1999, *The reappearance of spawning Atlantic herring (Clupea harengus) on Aberdeen Bank (North Sea) in 1983 and its relationship to environmental conditions*, Canadian Journal of Fisheries and Aquatic Sciences, 56: 2051–2061.

Joint Nature Conservation Committee, 2017, *A potential approach to assessing the significance of noise disturbance against Conservation Objectives of the harbour porpoise cSACs.*

Latto P. L, Reach I.S, Alexander D, Armstrong S, Backstrom J, Beagley E, Murphy K, Piper R & Seiderer L.J, 2013, *Screening Spatial Interactions between Marine Aggregate Application Areas and Sandeel Habitat*, A Method Statement produced for BMAPA.

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Rogers, 2000, *Working Paper to the Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem* (WGEXT)

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The Planning Inspectorate
Temple Quay House
2 The Square
Bristol
BS1 6PN

Your ref: EN010098-000019
Our ref:

By email to:
HornseaProjectFour@pins.gsi.gov.uk

13 November 2018

Dear Planning Inspectorate,

Scoping Opinion for the Proposed Hornsea Four Development

The MCA has reviewed the scoping report provided by Orsted as detailed in your letter of 16th October 2018 and would comment as follows:

The Environmental Statement should supply detail on the possible impact on navigational issues for both commercial and recreational craft, specifically:

Collision Risk
Navigational Safety
Visual intrusion and noise
Risk Management and Emergency response
Marking and lighting of site and information to mariners
Effect on small craft navigational and communication equipment
The risk to drifting recreational craft in adverse weather or tidal conditions
The likely squeeze of small craft into the routes of larger commercial vessels.

A Navigational Risk Assessment will need to be submitted in accordance with MGN 543 (and MGN 372) and the MCA Methodology for Assessing the Marine Navigation Safety & Emergency Response Risks of Offshore Renewable Energy Installations (OREI). This NRA should be accompanied by a detailed MGN 543 Checklist which can be found at https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping

We note that a vessel traffic survey will be undertaken to the standard of MGN 543. The survey will consist of 28 days of seasonal data (two x 14 day surveys) collected from a vessel-based survey using AIS, radar and visual observations to capture all vessels navigating in the study area.

The development area carries a significant amount of through traffic, with a number of important shipping routes in close proximity, and attention needs to be paid to routing, particularly in heavy weather ensuring shipping can continue to make safe passage without significant large scale deviations. The possible cumulative and in combination effects on shipping routes should also be considered, taking into proximity to other windfarm developments and the impact on navigable sea room.

The turbine layout design will require MCA approval prior to construction to minimise the risks to surface vessels, including rescue boats, and Search and Rescue aircraft operating within the site. As such, MCA will seek to ensure all structures are aligned in straight rows and columns, with at least two lines of orientation. Any additional navigation safety and/or Search and Rescue requirements, as per MGN 543 Annex 5, will be agreed at the approval stage.

The proximity of Hornsea Four to other offshore windfarms will also need to be fully considered, with an appropriate assessment of the distances between OREI boundaries and shipping routes as per MGN 543. MCA would also welcome early discussion on the lighting and marking arrangements.

Particular attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. If cable protection are required e.g. rock bags, concrete mattresses, the MCA would be willing to accept a 5% reduction in surrounding depths referenced to Chart Datum. This will be particularly relevant where depths are decreasing towards shore and potential impacts on navigable water increase.

Any application for safety zones will need to be carefully assessed and additionally supported by experience from the development and construction stages.

Particular consideration will need to be given to the implications of the site size and location on SAR resources and Emergency Response Co-operation Plans (ERCoP). A SAR checklist will also need to be completed in consultation with MCA.

MGN 543 Annex 2 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose.

On the understanding that the Shipping and Navigation aspects are undertaken in accordance with MGN 543 and its annexes, along with a completed MGN checklist, MCA are likely to be content with the approach.

Yours faithfully,

Helen Croxson
Offshore Renewables Advisor, Navigation Safety Branch

MINISTRY OF DEFENCE

Defence Infrastructure Organisation

MOD Safeguarding Department

Defence Infrastructure Organisation
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

[redacted]

www.mod.uk/DIO

Your ref: EN010098-000019

DIO ref. 10044539

13 November 2018

Dear Sir/Madam,

Hornsea Project Four Offshore Wind Farm

Application for a Development Consent Order for the Hornsea Project Four Offshore Wind Farm Planning Act 2008 (as amended) and the Infrastructure Planning (Environmental Impact Assessment) Regulations 10 and 11 Scoping Consultation

I write to confirm the safeguarding positon of the Ministry of Defence (MOD) in relation to the request made by the applicant for a scoping opinion from the Secretary of State on the information that should be provided in the Environmental Statement to support the above application.

The applicant has prepared an Environmental Impact Assessment: Scoping Report of the proposed development. This recognises the principal defence issues that will be of relevance to progression of the proposed development.

The extent of maritime military practise and exercise areas and use of airspace for defence purposes in the vicinity of the proposed development have been appropriately identified and considered.

The potential impact of the proposed development upon military low flying training activities has been identified and taken into account. The applicant has identified a need for aviation warning lighting to be fitted on offshore structures that will be 60 metres or greater in height above the surface. Subject to confirming the specification of the lighting to be used this should provide an appropriate address of this issue.

The potential for the offshore development area to contain historic disposal sites for chemical and explosive munitions has been identified and considered. In addition, the potential presence of unexploded ordnance has also been identified as a relevant consideration with respect to the construction of the foundations of the wind turbines and other structures. However, this potential

hazard has not been directly identified as a relevant consideration in relation to the installation of cables and other associated intrusive works that may be undertaken in the maritime environment.

The scoping report considers aviation and radar systems that may be affected by the proposed wind farm and specifically recognises that MOD air defence radar installations may be adversely affected. The report identifies the air defence radar sites at RAF Brizlee Wood and RAF Trimingham as relevant receptors but also needs to include the site at RAF Staxton Wold. The report recognises that the proposed wind farm is likely to have significant effects upon the operation of air defence radar systems. In Table 6.39 the anticipated importance of these impacts is appropriately rated as being high. The anticipated magnitude of the effects of the operational wind farm on air defence radars is currently rated as being moderate. Due to the scale of the proposed development it may be appropriate for this rating to be increased.

The applicant has recognised the potential need for mitigation to address the impacts on air defence radars. Should this be confirmed as necessary, it will be for the application to provide appropriate technical mitigation(s) in relation to the relevant air defence radar sites.

In relation to the onshore element of the proposed development, the proposed location where the sea cables will come ashore and onshore cable route to connect the wind farm to the national grid will not pass through any MOD statutory safeguarding zones protecting operational defence installations. However, it should be noted that the proposed cable route does pass near the western extent of the MOD statutory technical safeguarding zone encompassing the transmitter/receiver installations at the MOD Leconfield site. Should the cable route or area of search for the development of a new sub-station be amended and occupy this zone, then the relevant safeguarding criteria would need to be taken into account.

I trust this clarifies our position on this consultation. Please do not hesitate to contact me should you wish to consider these points further.

Yours faithfully

Jon Wilson

Senior Safeguarding Officer

From: NATS Safeguarding [mailto:NATSSafeguarding@nats.co.uk]
Sent: 31 October 2018 14:24
To: Hornsea Project Four
Subject: RE: EN010098 - Hornsea Project Four Offshore Wind Farm - EIA Scoping Notification and Consultation [Our Ref: SG27058]

We refer to the application above. The proposed development has been examined by our technical safeguarding teams. In the timeframe given to us we have been unable to thoroughly investigate the effects of the proposed development on our Operations, however, the relevant teams are being consulted.

Based on our preliminary technical findings, the proposed development does conflict with our safeguarding criteria. Accordingly, NATS (En Route) plc objects to the proposal. We will notify you within 4-6 weeks of the results of our operational assessment. Only if this assessment shows the impact to be acceptable will we be able to withdraw our objection.

We would like to take this opportunity to draw your attention to the legal obligation of local authorities to consult NATS before granting planning permission for a wind farm. The obligation to consult arises in respect of certain applications that would affect a technical site operated by or on behalf of NATS (such sites being identified by safeguarding plans that are issued to local planning authorities).

In the event that any recommendations made by NATS are not accepted, local authorities are further obliged to notify both NATS and the Civil Aviation Authority ("CAA") of that fact (which may lead to the decision made being subject to review whether by the CAA referring the matter for further scrutiny or by appropriate action being taken in the courts).

As this further notification is intended to allow the CAA sufficient time to consider whether further scrutiny is required, we understand that the notification should be provided prior to any granting of permission. You should be aware that a failure to consult NATS, or to take into account NATS's comments when deciding whether to approve a planning application, could cause serious safety risks for air traffic.

If you have any queries regarding this matter you can contact us using the details as below.

Yours faithfully

NATS Safeguarding

[redacted]
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Land and Acquisitions
Anne Holdsworth
DCO Liaison Officer
Network Management
[redacted]

www.nationalgrid.com

SUBMITTED ELECTRONICALLY:
HornseaProjectFour@pins.gsi.gov.uk

09 November 2018

Dear Sir/Madam

EN010098 APPLICATION BY ORSTED (THE APPLICANT) FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE HORNSEA PROJECT FOUR OFFSHORE WIND FARM (THE PROPOSED DEVELOPMENT)
SCOPING CONSULTATION

This is a response on behalf of National Grid Electricity Transmission PLC (NGET) and National Grid Gas PLC (NGG)

I refer to your letter dated 16th October 2018 in relation to the above proposed application. Having reviewed the scoping report, I would like to make the following comments:

National Grid infrastructure within / in close proximity to the order boundary

Electricity Transmission

National Grid Electricity Transmission has high voltage electricity overhead transmission lines and a high voltage substation cables within the onshore scoping area. The overhead lines and substation form an essential part of the electricity transmission network in England and Wales.

Substation

- Creyke Beck 400kV

Overhead Lines

- 4ZQ (400kV) overhead line route
  - Creyke Beck to Humber Refinery to Keadby
  - Creyke Beck to Keadby to Killingholme
- 4ZR (400kV) overhead line route
  - Creyke Beck to Thornton 1
  - Creyke Beck to Thornton 2
- YYW (275kV) overhead line
  - Creyke Beck to Salt End North
  - Creyke Beck to Hedon

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Gas Transmission Infrastructure:

National Grid Gas has high pressure gas transmission pipelines located within or in close proximity to the proposed order limits. The transmission pipelines form an essential part of the gas transmission network in England, Wales and Scotland:

- Feeder Main 6 – Burton Agnes to Paull
- Feeder Main 29 – Easington to Asselby

I enclose plans showing the route of National Grid's overhead line and the gas transmission pipelines.

Specific Comments – Electricity Infrastructure:

- National Grid's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset

- Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004)

- If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.

- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance.

- Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above.

- If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.

- Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above.

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- National Grid Electricity Transmission high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide National Grid full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with National Grid prior to any works taking place.

- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.

Gas Infrastructure

The following points should be taken into consideration:

- National Grid has a Deed of Grant of Easement for each pipeline, which prevents the erection of permanent / temporary buildings, or structures, change to existing ground levels, storage of materials etc.

Pipeline Crossings:

- Where existing roads cannot be used, construction traffic should ONLY cross the pipeline at previously agreed locations.

- The pipeline shall be protected, at the crossing points, by temporary rafts constructed at ground level. The third party shall review ground conditions, vehicle types and crossing frequencies to determine the type and construction of the raft required.

- The type of raft shall be agreed with National Grid prior to installation.

- No protective measures including the installation of concrete slab protection shall be installed over or near to the National Grid pipeline without the prior permission of National Grid.

- National Grid will need to agree the material, the dimensions and method of installation of the proposed protective measure.

- The method of installation shall be confirmed through the submission of a formal written method statement from the contractor to National Grid.

- Please be aware that written permission is required before any works commence within the National Grid easement strip.

- A National Grid representative shall monitor any works within close proximity to the pipeline to comply with National Grid specification T/SP/SSW22.

- A Deed of Consent is required for any crossing of the easement

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Cable Crossings:

- Cables may cross the pipeline at perpendicular angle to the pipeline i.e. 90 degrees.
- A National Grid representative shall supervise any cable crossing of a pipeline.
- Clearance must be at least 600mm above or below the pipeline.
- Impact protection slab should be laid between the cable and pipeline if cable crossing is above the pipeline.
- A Deed of Consent is required for any cable crossing the easement.
- Where a new service is to cross over the pipeline a clearance distance of 0.6 metres between the crown of the pipeline and underside of the service should be maintained. If this cannot be achieved the service shall cross below the pipeline with a clearance distance of 0.6 metres.

General Notes on Pipeline Safety:

- You should be aware of the Health and Safety Executives guidance document HS(G) 47 "Avoiding Danger from Underground Services", and National Grid's specification for Safe Working in the Vicinity of National Grid High Pressure gas pipelines and associated installations - requirements for third parties T/SP/SSW22.
- National Grid will also need to ensure that our pipelines access is maintained during and after construction.
- Our pipelines are normally buried to a depth cover of 1.1 metres however; actual depth and position must be confirmed on site by trial hole investigation under the supervision of a National Grid representative. Ground cover above our pipelines should not be reduced or increased.
- If any excavations are planned within 3 metres of National Grid High Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a National Grid representative. A safe working method agreed prior to any work taking place in order to minimise the risk of damage and ensure the final depth of cover does not affect the integrity of the pipeline.
- Excavation works may take place unsupervised no closer than 3 metres from the pipeline once the actual depth and position has been has been confirmed on site under the supervision of a National Grid representative. Similarly, excavation with hand held power tools is not permitted within 1.5 metres from our apparatus and the work is undertaken with NG supervision and guidance.

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To view the SSW22 Document, please use the link below:
http://www.nationalgrid.com/uk/LandandDevelopment/DDC/GasElectricNW/safeworking.htm

To download a copy of the HSE Guidance HS(G)47, please use the following link:
http://www.hse.gov.uk/pubns/books/hsg47.htm

Further Advice

We would request that the potential impact of the proposed scheme on National Grid's existing assets as set out above and including any proposed diversions is considered in any subsequent reports, including in the Environmental Statement, and as part of any subsequent application.

Where any diversion of apparatus may be required to facilitate a scheme, National Grid is unable to give any certainty with the regard to diversions until such time as adequate conceptual design studies have been undertaken by National Grid. Further information relating to this can be obtained by contacting the email address below.

Where the promoter intends to acquire land, extinguish rights, or interfere with any of National Grid apparatus protective provisions will be required in a form acceptable to it to be included within the DCO.

National Grid requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. All consultations should be sent to the following email address: **box.landandacquisitions@nationalgrid.com**

I hope the above information is useful. If you require any further information please do not hesitate to contact me.

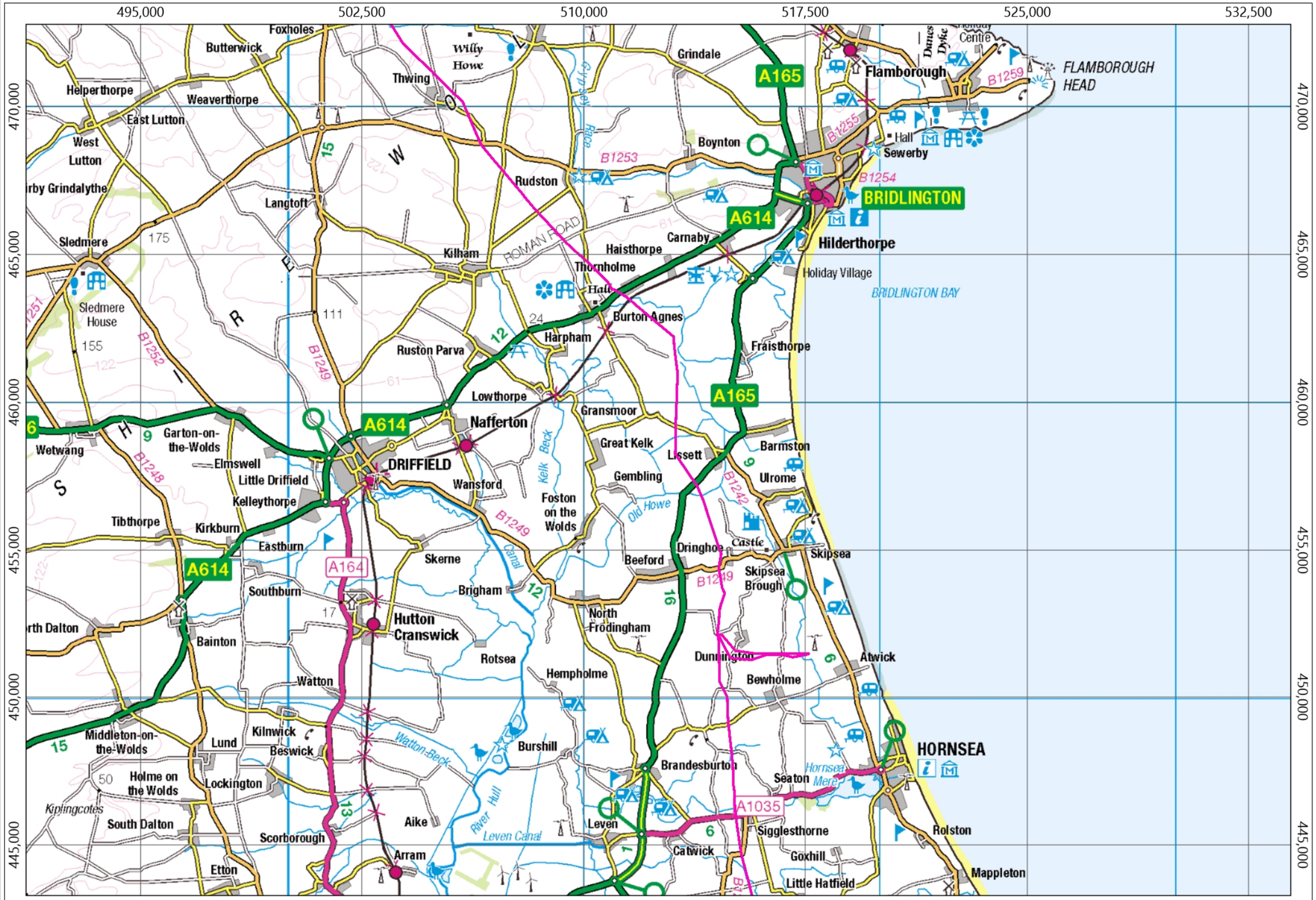
The information in this letter is provided not withstanding any discussions taking place in relation to connections with electricity or gas customer services.

Yours faithfully

[redacted]

Anne Holdsworth
DCO Liaison Officer, Land and Acquisitions

nationalgrid | Hornsea 4 Plan 1



Legend:

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- OHL 275Kv Commissioned
- OHL 132Kv & Below Commissioned
- Buried Cable Commissioned
- Gas Pipe Feeder
  - Commissioned
  - Decommissioned Group
  - Planned and Spares

Notes:

Hornsea 4 Plan 1

0 3.18 6.4 Kilometers

Date: 09/11/2018
Time: 11:24:05

Page size: A3 Landscape Scale: 1: 125,000
Print by: **Holdsworth, Anne**

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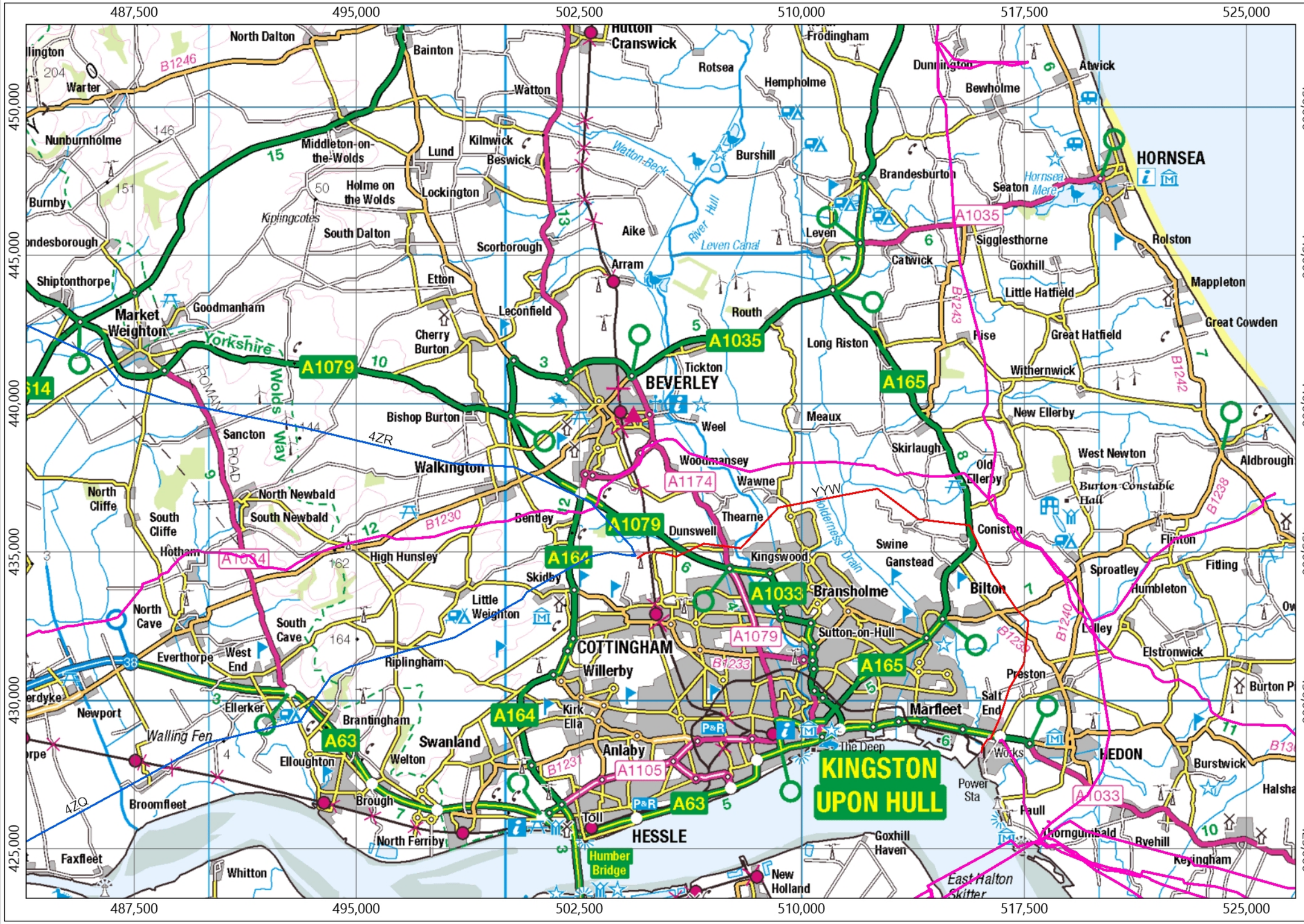
nationalgrid | Hornsea 4 Plan 2



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- OHL 275Kv Commissioned
- OHL 132Kv & Below Commissioned
- Buried Cable Commissioned
- Gas Pipe Feeder
  - Commissioned
  - Decommissioned Group
  - Planned and Spares

Notes:

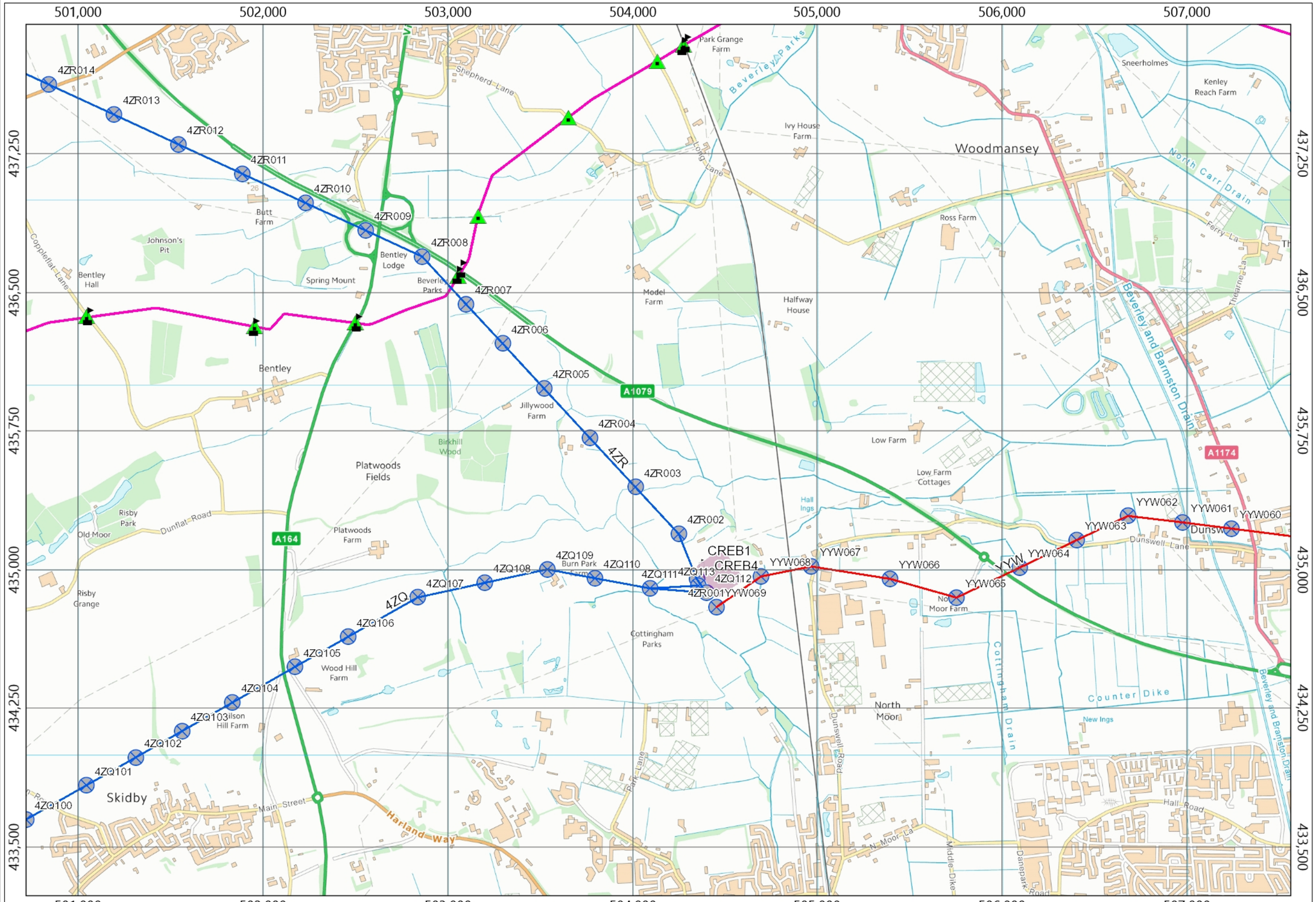
Hornsea 4 Plan 2

0 3.18 6.4 Kilometers

Date: 09/11/2018
Time: 11:26:17

Page size: A3 Landscape Scale: 1: 125,000
Print by: **Holdsworth, Anne**

nationalgrid | Hornsea 4 Plan 3



Legend:

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- Circuits
  - Commissioned
  - Decommissioned Group
  - Planned and Spares
- OHL 400Kv Commissioned
- OHL 275Kv Commissioned
- OHL 132Kv & Below Commissioned
- Towers Commissioned
- Buried Cable Commissioned
- Fibre Cable Commissioned
- Pilot Cable
- Oil Pipe
- Cooling Pipe
- Cooling Station
- RAMM
- Gas Operational Boundary
- Gas Site Boundary
- Block Valve
- Compressor
- LNG Site
- Multijunction
- Minimum Offtake
- Future Minimum Offtake
- Offtake
- Pressure Reduction Installation
- Pig Trap
- Terminal
- Transferred Offtake
- Aerial Marker Post
- CP Test Post
- Transformer Rectifier
- Gas Pipe Feeder
  - Commissioned
  - Decommissioned Group
  - Planned and Spares
- CP Protected Section Range
- Pipe Line Control Point

Notes:

Hornsea 4 Plan 3

0 0.51 1.0 Kilometers

Date: 09/11/2018
Time: 11:28:51

Page size: A3 Landscape Scale: 1: 20,000
Print by: **Holdsworth, Anne**

N

From: Brown, Emma (NE) [redacted]
Sent: 13 November 2018 17:50
To: Hornsea Project Four
Subject: Natural England's response to the Hornsea Project Four Scoping Consultation

Good Afternoon,

Please find attached Natural England's response to the Scoping Consultation for Hornsea Project Four, along with our Offshore Cabling paper which we refer to within our response.

The scoping report was much more of an extensive document we'd anticipated (at 782 pages), and given that the timeframe for response has coincided with Deadline 1 for Hornsea Project Three, it has been challenging to meet this deadline.

Although we believe we have undertaken a comprehensive review, given these challenges we would like to reserve the right to add further detail within future Expert Working Group meetings and in our response to future statutory consultations as appropriate.

Kind regards,

Emma

Emma Brown
Marine Senior Adviser
Yorkshire & Northern Lincolnshire
Natural England
Lateral, 8 City Walk, Leeds, LS11 9AT
[redacted]

Please note I currently work Monday - Thursday

http://www.gov.uk/naturalengland

We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

Date: 13 November 2018
Our ref: 361691
Your ref: EN010098-000019

Secretary of State
c/o Planning Inspectorate
3/18 Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

Eastleigh House,
Upper Market
Street Eastleigh,
SO50 9YN

T 0300 060 3900

BY EMAIL ONLY

Dear Secretary of State,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations)– Regulations 10 and 11

Application by Ørsted (the Applicant) for an Order granting Development Consent for the Hornsea Project Four Offshore Wind Farm (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Thank you for your letter dated 16 October 2018 consulting Natural England on the Hornsea Project Four Environmental Impact Assessment Scoping Report.

1. Background

It is important to note that many of the issues pertinent to this application are likely to be similar to those raised in relation to the Hornsea Project One, Hornsea Project Two and Hornsea Project Three Environmental Impact Assessments (EIA) and Environmental Statements (ES), as well as those raised in relation to the Dogger Bank projects, Norfolk Vanguard and Thanet. We therefore strongly advise that due consideration is given to Statutory Nature Conservation Body (SNCB) advice that has been and is currently being provided in relation to these developments and associated environmental impacts.

2. Pre-Application Consultation

Natural England recognises the importance of the pre-application stage of the PINS consenting regime and as such seek to make this process as effective as possible. The Applicant has begun an Evidence Plan process and has engaged Natural England at both the Steering Group and Topic Group level. However, the scoping report was submitted to PINS shortly after these meetings took place and as such Natural England had little scope to influence and advise on its content.

Natural England recognises that timeframe for this project places constraints on pre-application process. However, insufficient time to deal with key environmental concerns prior to submission of the application poses a risk to the development and we encourage the developer allow sufficient time within the Evidence Plan Process to address them.

3. Scoping Opinion

We recognise that it is a statutory requirement for developers to undertake consultation on a Scoping Report.
On review of the report submitted by the Applicant pertaining to Hornsea Project Four, Natural England considers that the approach adopted within this scoping report has led to a number of impacts being screened out without adequate justification. Consequently we are providing overarching comments on this novel approach to EIA within this section, along with detailed comments in the Annexes.

3.1 General Approach to EIA

Natural England supports initiatives such as the IEMA 'proportionate EIA' guidance to reduce EIA length and the associated burden on the sector, including consultees. However, there are potential risks with the interpretation of this guidance, and inevitably there will also be some 'teething' issues and unforeseen consequences resulting from its interpretation and application, as set out below:

3.1.1 Length of the scoping report

Whilst the scoping report for an offshore NSIP is likely to be longer than most others, we note that the 'proportionate EIA' approach has produced a very lengthy scoping report (782pp). This makes reviewing the information provided in standard EIA scoping response deadlines rather challenging. Whilst the approach could result in an overall reduction in the amount of consultation material by resulting in a streamlined Environmental Statement in due course, the level and nature of the information produced to support decisions to 'scope out' impacts indicates that this may not be achieved through an overall reduction of consultation material.

3.1.2 Basis for 'Scoping out' issues from the EIA

Please see Natural England's detailed comments regarding those issues we believe to have been incorrectly or prematurely 'scoped out' of the EIA. This appears to result from the following procedural issues:

a) Conclusions of previous OWF ESs - some issues have scoped out on the basis that significant impacts have not been predicted in other OWF ESs, including those of other 'Hornsea zone' projects. This approach obscures the potential for an enhanced level of impact to arise due project site specifics to e.g. its proximity to a receptor. This approach also inadequately establishes the appropriate baseline for the ES, which is likely to involve significant levels of development from consented projects in the southern North Sea, and therefore impairs the assessment of cumulative impacts, particularly from Hornsea 1 and Hornsea 2.

b) Reliance on a high-level 'Commitment Register'– the applicant has used a 'Commitment Register' to identify measures which will mitigate for potential impacts, and these are used to support decisions to 'scope out' issues. However, a number of these 'Commitments' are broad in nature, and/or are reliant on site-specific considerations which are not documented. For example, several of the Commitments are caveated with phrases such as 'where practical' and 'where possible'. If impacts are uncertain, the issue should be 'scoped-in' for detailed assessment rather than scoped out due to generic or equivocal commitments. Some of the Commitments are potentially misleading e.g. that the permanent project footprint will ('where technically practical') avoid SSSI units, whereas the onshore cable route overlaps with the River Hull Headwaters SSSI. Whilst we recognise that these Commitments will become more

detailed as the project evolves – and that this approach could usefully inform DCO/DML conditions - at this stage we question whether this approach has allowed evidence-based, site-specific scoping decisions to be carried out.

c) Treatment of mitigation - more generally, it is accepted good EIA practice to identify significant effects of impacts in the absence of any mitigation, and any residual impacts following mitigation. These are important elements needed to accurately assess the likely effectiveness of the mitigation proposed, and are particularly important for considering cumulative impacts. Within this scoping exercise the determination of magnitude and therefore significance assumes the implementation of mitigation measures, and assumes that they will be effective at reducing the impact. Given the high-level and heavily caveated nature of the 'Commitments', we question whether these assumptions are appropriate. Potential environmental impacts could be underestimated if issues are scoped out prematurely. Natural England therefore advises that where mitigation is required, the issue is scoped in to the ES, and the applicability and suitability of the mitigation measure explored in a simple assessment.

d) Assuming Conclusions of Forthcoming Assessments – impacts on e.g. seabird foraging resources are scoped out on the basis of previous OWF ESs not having identified significant issues – see our comments above. However, it is also scoped out on the assumption the conclusion of assessments of other potential impacts e.g. marine processes, fisheries, even though these assessments have not been carried out. In this context, Natural England suggests it is more logical to scope these issues into, rather than out of, the ES.

3.1.3 Integration of the Overall Assessment of Environmental Impacts

One core element of the EIA/ES is to document impacts on designated sites. These sites sit within a wider ecological system, particularly in the marine environment, where indirect impacts, including cumulative ones, may arise over a large distance. However, the approach proposed by the applicant risks a fragmenting of the traditional approach of considering designated sites in the context of that 'parent' environment. For example, 'benthic and intertidal ecology' is proposed to be 'scoped out' of the ES; however the report acknowledges the potential for indirect impacts on two Marine Conservation Zones (MCZs) designated for their benthic ecology, which will be considered in separate ES Appendices.

This approach seems likely to lead to increasingly 'fragmented' Environmental Statements, where assessments required under different legislation are presented altogether separately rather than integrated into a single assessment: the role of the ES in synthesising and summarising environmental information will be diminished. For example, whilst we have not reviewed the HRA screening as it was not consulted on by PINS, it seems plausible that some European sites will be screened in for further assessment even though the same impact will have been screened out at the ES level. Natural England questions whether the loss of this 'one-stop shop' will benefit consultees in appraising the environmental impacts, particularly non-specialist stakeholders.

In addition, it is unclear how the assessments and conclusions of the scoping report will be documented at the application stage. Without appropriate documentation, there is a risk here that consultees will interpret some issues as having been omitted.

3.1.4 Simple vs. detailed assessments

The scoping report takes a tiered approach to the assessments likely to be required to inform

the ES. Whilst we recognise that this will be an iterative approach, we are not sure that this broad distinction (and the request for stakeholders to agree/disagree with the options selected) adds great value to the scoping report, given the early stage in the Evidence Plan process, when detailed discussions of the most appropriate methodology may not yet have been carried out.

3.1.5 Approach to inter-related effects

Where an issue has been scoped out of the ES, the applicant has also scoped it out of any consideration of inter-related effects. This does not seem to be a logical approach to the consideration of additive or synergistic impacts arising from the different effects arising from the proposal.

4. Section 42: Preliminary Environmental Information (PEI)

It is the view of Natural England that the most appropriate form for a PEI to adopt is that of a draft Environmental Statement (ES). This would reassure Natural England, and other key stakeholders, that the Applicant's approach to EIA is appropriate and to allow time for areas of concern to be raised and resolved prior to submission of the final ES to PINS. It is, therefore, sensible to maximise the opportunities in pre-application for open and constructive dialogue, to reduce the risk of an application being rejected by PINS. It is also our experience that if too many issues are left unresolved at application then this causes increased pressure for all involved during the Examination process. As such we would expect emphasis on effective pre-application engagement between the developer and Natural England, and for the PEI to present sufficient detail such that an assessment of the Applicant's approach to EIA can be made.

4.1 Environmental Statement

Natural England notes an increased reliance on the contents of the environmental statement, in the post consent/condition discharge phase of offshore wind farm development. Quite often the project teams responsible for the application are different to those responsible for the implementation, much of the detail outside of the ES can be lost along the way, making the post consent phase difficult to navigate for all involved. It is therefore becoming increasingly important that the ES represents a one-stop-shop of environmental considerations and constraints, with clear linkages made between the conclusions of the ES and their translation into the DCO/DML conditions.

This need not necessarily run contrary to the proportionate approach.

5. Habitats Regulations Assessment (HRA)

In accordance with the 2010 Habitats Regulations (as amended) 61(2) anyone applying for development consent for an NSIP must provide the competent authority with such information as may reasonably be required "for the purposes of the assessment" or "to enable them to determine whether an appropriate assessment is required". The SNCBs advise that this information should therefore be provided and appraised as part of the EIA process.

6. Further Liaison and Advice

Hornsea Project Three lies in relative proximity to other Round 3 projects currently pursuing development consent for the phased development of large scale wind arrays within the North Sea. These include: Hornsea Projects One, Two and Three, Dogger Bank Creyke Beck (A & B), Dogger Bank Teesside (A & B), Norfolk Vanguard and Boreas and the East Anglia offshore wind farm projects. We would strongly recommend that collaborative working is pursued with these other projects who are likely to be facing the same consenting risks. We recognise the value of collaborative working particularly in relation to cumulative and in-combination impacts (including non-wind farm projects). We strongly support any initiatives to pursue collaborative working and are

happy to engage in any such projects that the Applicant may progress.

In addition to this, the further development of offshore wind farms presents an opportunity to learn from previous development and to further refine survey and monitoring methods to ensure that the practicality and effectiveness of methods employed means that key data gaps are addressed. There is, therefore, a role for consenting authorities, developers and consultees to increase the understanding of the effects of offshore wind farms as well as securing best practice in further developments. Natural England emphasises the importance of incorporating the experience of constructed windfarms in consideration of the feasibility of the design parameters and in the understanding of impacts.

7. Key Environmental Issues

We provide our detailed advice in relation to the scoping report in **Annexes 1-6.**

Our key concerns are as follows and we consider that these issues will need thorough consideration through EIA and close discussion between the Applicant, Natural England and where possible the regulators and Marine Management Organisation (MMO):

- The potential effects of this development proposal on birds during all phases of development encompassing displacement, indirect effects (through impacts on prey species) and collision mortality – both at a project-level and cumulatively.
- Potential effects on marine mammals from noise during construction – both at a project-level and cumulatively.
- Potential impacts on the designated site features along the offshore export cable route – both at a project-level and in-combination
- Potential impacts at the landfall location both alone and in-combination/cumulative other sea defence and coastal infrastructure projects.
- Potential effects on marine mammals from noise during construction – both at a project-level and cumulatively.
- Potential impacts on the designated site features along the onshore export cable route – both at a project-level and in-combination
- Potential impacts on the Heritage Coasts.

If you have any questions regarding the above comments or want to discuss further any of the issues we have raised please do not hesitate to contact Maria Milititsky at Natural England on the details provided below.

Yours sincerely,

Maria Milititsky
Marine Lead Adviser – Major Casework
E-mail: maria.milititsky@naturalengland.org.uk
Telephone: 02085654787

Annex 1 – Introduction, project background and description (Chapters 1-4)

SR Section	Comment
General Comment	A thorough consideration should be given to carrying out a realistic assessment as to how cables will be buried and what level of protection will be needed where cables cannot be buried. Cable crossings, mobile areas of seabed and harder substrates have all presented issues for cable burial and remedial works in other wind farms. From previous experience cable protection is essential at cable crossings and may be required in other areas where optimum burial depth cannot be achieved, as discussed in Natural England's paper on offshore wind cabling, ten years' experience and recommendations (Natural England, 2018) sent alongside Natural England's response to the scoping report consultation. It is anticipated that cable protection will be required but there is no assessment of how much and where such cable protection is expected to be necessary and this will be needed to establish a realistic worst case scenario against which impacts from such activities can be assessed. Until this information is presented Natural England do not consider it possible to full scope out the impacts on benthic ecology and marine processes.
General Comment	Following from the comment above, according to the scoping report, at the end of the operational lifetime of the windfarm it is anticipated all offshore structures above the seabed will be completely removed, the site of the onshore substation will be restored and that all electrical cables will be left in-situ to minimise environmental impacts associated with their removal (see 3.6.1.3). However it has not been specified what is anticipated regarding scour and cable protection and this becomes particularly relevant when assessing whether impacts derived from scour and cable protection are of a temporary or permanent nature. Although Natural England appreciates that a definite decommissioning plan is not to be delineated at this stage, the scoping report is anticipating the use of scour and cable protection throughout the project and as such consideration should be given to the likelihood of scour/cable protection being removed or left in situ. Again, until this information is presented Natural England do not consider it possible to full scope out the impacts on benthic ecology and marine processes.
General Comment	Consideration should also be given to seabed preparation activities, including seabed levelling and boulder clearance. Boulders should not be categorised as debris such as fishing nets or lost anchors (see 3.3.4.3) and therefore boulder clearance should be considered separately from debris removal activities and its impact assessed independently. Again a clear realistic assessment of these activities should be conducted and considered within the ES. Again, until this information is presented Natural England do not consider it possible to full scope out the impacts on benthic ecology and marine processes.

Annex 2 – Marine Geology, Oceanography and Physical Processes (Section 6.1) and Subsea Noise (Section 6.2)

SR Section	Comment
General Comment	Several assessments on these chapters (and as well as other chapters) draw on data from previous models developed for the former Hornsea zone. Although Natural England recognises the potential applicability of these models for Hornsea Project Four and agrees with maximizing the use of these data sets and previously developed models for the Hornsea zone , we would like to further justification of the applicability of these models to the Hornsea Project 4 area and to see these models testing using actual data that is increasingly becoming available from the Hornsea zone and other projects where relevant. Testing previous models has already been proposed at the evidence plan technical panel meetings and Natural England would like to reiterate the relevance of testing the models used. If it is established that the models are reflecting reality correctly then there is greater confidence in extrapolating those models to Hornsea Project Four.
Section 6.1 – Marine Geology, Oceanography and Physical Processes	
6.1.3.28	Natural England would like further clarification of the rationale behind the chosen physical process features considered as potential receptors before we can reach a conclusion on their validity. Further detail on construction activities on landfall should also be provided i.e., the size and location of exit pits, if a cofferdam will be needed, and details around intertidal access since these activities might interfere with sediment transport along the coast and within the nearshore environment. Further consideration should be given to the nearshore environment, which might highlight other potential receptors, such as the Humber estuary, Flamborough Head SAC/SPA, Holderness Inshore MCZ or geological SSSIs along the Holderness Coast. In previous projects the impact of suspended sediment not correctly assessed has shown to deposit in Bridlington Bay and causing unexpected effects hence the need to better understand the nearshore processes and account for those when identifying potential receptors.
Table 6-2	Although Natural England welcomes the commitment to avoid the Holderness Inshore MCZ and Holderness Offshore rMCZ,'where practical' NE notes that as it currently stands the offshore ECC just overlaps with the northernmost extent of the Holderness Inshore MCZ and the northernmost extent of the Holderness Offshore rMCZ. the avoidance of the MCZs is not necessarily a mitigation measure per se but only avoidance, and therefore consider that it is inappropriate to scope out impacts on the site at this stage. It should also be noted that all impacts on designated sites (i.e. direct and indirect, temporary and permanent) should be considered and addressed as far as possible.
6.1.6.6	Based on potential blockage related impacts to the shoreline, offshore sandbanks and the Flamborough Front only resulting in effects of negligible or minor adverse significance for the other projects on the Hornsea zone, a simple assessment was proposed for Hornsea Project Four. However Natural England highlights a more detailed assessment may be required if the simple assessment indicates any issues that might require further consideration.
Table 6-3 and	In Table 6-3 scouring around foundation has been presented as an impact to be scoped out. Further down in the text it is specified

SR Section	Comment
6.1.7.1	that the assessment of scour around turbines will only be scoped out if the option to place scour protection on the seabed prior to foundation installation is confirmed since this would mitigate the scour process and the potential for seabed sediments to be locally eroded around any foundation (6.1.7.1). Scouring around turbines should therefore be scoped in at this stage until it is determined if scour protection will be placed prior to foundation installation. If it is secured that scour protection will be put in place ahead of installation by a condition, and the draft condition is agreed, then a simple assessment would possibly suffice to assess these impacts but a more detailed assessment could be required.
6.1.7.2	Changes to sediment pathways have been scoped out for Hornsea Project Four, justified by the fact that previous assessments for Hornsea Projects One, Two and Three have shown that impacts on sediment pathways are likely to be of minor adverse significance. The applicant needs to provide more evidence on why these assessments concluded minor adverse significance for the other Hornsea projects so it can be established if the conditions and reasoning supporting those assessments are also applicable to Hornsea Project Four. A simple assessment might be able to demonstrate that the conclusions reached for the other projects in the Hornsea zone are also applicable to Hornsea Project 4. Furthermore minor adverse impacts should not be automatically scoped out since in this way these impacts will not be considered cumulatively and in-combination and therefore overlooked in these assessments.
Section 6.2 – Subsea Noise	
General comment	The possible modelling of UXOs is not mentioned in this section, but is mentioned within Table 6-16. An assessment albeit a simple one, will be required to assess the impact of UXOs alone and in combination with other underwater noise producing activities.

Annex 3 – Benthic and Intertidal Ecology (Section 6.3), Fish and Shellfish Ecology (Section 6.4) Marine Mammals (Section 6.5) and Offshore and Intertidal Ornithology (Section 6.6)

SR Section	Comment
Section 6.3 – Benthic and Intertidal Ecology	
General Comment	The applicant is scoping out all benthic and intertidal related impacts with the intention of giving no further consideration to this topic in the subsequent steps of the EIA process. Natural England does not agree that this is appropriate at this stage. Site specific data is available from the former Hornsea zone, however these data do not cover the whole of the Hornsea Project Four array area (c. 20% has not been surveyed), most of the Array Export Cable Corridor Funnel and the whole of the Marine Export Cable Corridor (ECC), with some coverage on the Nearshore ECC Funnel, where it overlaps with data collected for Dogger Bank Creyke Beck ECC, extending about 8km from shore and there is no intention on collecting anymore data. As such there is a certain degree of uncertainty regarding these unsurveyed areas. Additionally there is limited detail provided regarding cable installation and the potential need for cable protection. It is acceptable to have some uncertainty provided a Worst Case Scenario (WCS) is assumed. However, in the absence of this information the applicant is effectively assuming that these unsurveyed areas will present no challenges and it will be possible to bury their cables to optimal depth without the need of cable protection and the habitats will recover from cable burying activities. This does not seem that facing uncertainty the applicant it assuming the WCS but instead the "best case scenario" where cable installation will not be an issue. As already mentioned, previous experience has shown this is seldom the case (Natural England, 2018). Again it is possible that this can be dealt with as a simple assessment, with appropriate DCO/DML conditioning, provided a realistic worst case scenario is considered.
General Comment	The applicant relies on EU SeaMap Predicted Habitats as an indicator of the habitats present in the unsurveyed areas. Data from site specific surveys have shown some disparity to the EU SeaMap prediction (see 6.3.3.5) and the applicant states that "the confidence in the EUSeaMap predictions is moderate across the entire Hornsea Four array area and the majority of the offshore ECC". Natural England recognises that none of these areas overlap with marine protected areas. Nonetheless, Natural England disagrees with scoping out all benthic and intertidal related impacts at this stage due to the uncertainty regarding the habitats present in the overall Hornsea Project Four area combined with the lack of detail regarding the project proposals.. (See also comment below regarding 6.3.7.10)
General Comment	As mentioned above, it is not yet clear which structures will be left in situ at the decommissioning phase of Hornsea Project Four, particularly scour and cable protection. The impact of structures left in situ has not been considered. Our previous experience with other Offshore Windfarm projects has shown that scour and cable protection have proven to be very difficult to retrieve from the seafloor, therefore the worst case scenario is that these will be left in situ and as such a clear quantification will need to be provided and the impacts assessed beyond the lifetime of Hornsea Project Four.
6.3.3.11	The applicant should clarify the reasoning behind the selection of the benthic and intertidal ecology receptors identified within the benthic and intertidal ecology study area. These should also consider any other sensitive receptor that might be identified through the pre-construction survey for instance, proposed to be undertaken prior to installation within the Hornsea Four array area and offshore ECC. Given that the current baseline data does not cover 100% of site, this is a possibility that needs to be considered,

SR Section	Comment
	since currently it does not represent a WCS again.
Table 6-6	Regarding the mitigation measures proposed, Natural England would like to reiterate that the commitment to avoid MCZs/rMCs 'where practical' is not sufficient to enable impacts to Holderness Inshore MCZ and Holderness Offshore rMCZ to be scoped out at this stage. Also, Natural England does not see how undertaking a cable burial risk assessment will mitigate against habitat loss or seabed disturbance from cable maintenance activities so further clarification would be needed as to how it would be a mitigation measure. Regarding foundations and cable route micro-sitting (Co84) as well as the ECC and cable landfall avoiding all statutory marine designated areas (Co86), these measures should be secured through conditioning on dML/DCO.
6.3.7.10	Although it is generally proposed no more data will be acquired, in this paragraph it is mentioned that prior to installation, a pre-construction survey will be undertaken, and data analysed to identify any sensitive receptors (i.e. habitats of high nature conservation interest) within the Hornsea Four array area and offshore ECC. The sensitivity of any benthos present with a high nature conservation value to small scale habitat loss would be high. Scoping out impacts where the sensitivity of the receptor might be high, by assuming the majority is low does not represent a WCS approach. If there is the possibility of highly sensitive habitats to be present this is the WCS that needs to be taken forward in the absence of further information, and therefore should not be scoped out while information is not yet available. As mentioned before, it might be a case of a simple assessment where it is shown that in fact there are not sensitive habitats present in the area, but until that is shown, a WCS must be assumed.
6.3.8.1	Natural England does not agree with the Proposed Approach to the PEIR and ES where it is proposed to scope out of all the potential impacts on benthic ecology from any further consideration in the EIA process. Furthermore, these also need to be considered cumulatively.
Section 6.4 – Fish and Shellfish Ecology	
General Comment	Similarly to benthic ecology it should be noted that the baseline data collected for the former Hornsea zone does not cover the totality of the Hornsea Project Four array and ECC areas and there is no intention of collecting more data.
General Comment	Natural England is not fully convinced impacts on sandeel and herring can be all scoped out (with the exception of impacts arising from noise and vibration which have been scoped in) since the Hornsea Project Four array area overlaps high intensity sandeel spawning areas and the ECC overlaps with the area close to the coast where the IHLS data suggests that herring spawning occurs in higher intensity. Natural England would like to confer with Cefas and the MMO within the Expert Working Group Meetings about their opinion on this matter.
Table 6-10	For certain fish and shellfish species where only data from Coull *et al.* (1998) is available showing areas of spawning/nursery of undetermined intensity (see figures 6.16 to 6.20), these have been transcribed to Table 6-10 as being of low intensity (e.g. Lemon sole, Sprat), not reflecting a WCS. In Table 6.10 Cod shows as having low intensity nursery area overlapping with the array area or ECC while Figure 6.18 shows the ECC crossing almost exclusively areas of high intensity nursery (according to Ellis *et al.*, 2010) and as such this should be the WCS. Sandeel has been described in Table 6-10 as having High intensity spawning areas at the northern periphery of site while the figure suggest that roughly half of the array area falls within high intensity spawning area for sandeel, so slightly misleading. Similarly Herring has been described in Table 6-10 as having a partial overlap (of the ECC) with low intensity spawning areas, while Natural England is not so confident these are low intensity spawning areas (Coull et al., 1998

SR Section	Comment
	describes as undetermined and larva data shows close high intensity spawning area). As such Natural England finds this table misleading or at least not accounting for a WCS but a "best case scenario" instead. Again, Natural England would welcome further discussion on this at an Expert Working Group Meeting.
Section 6.5 – Marine Mammals	
General Comment	Natural England is unable to agree that the embedded mitigation measures described are suitable to manage and mitigate all potential effects of Hornsea Four on marine mammal receptors
General Comment	Natural England would welcome further discussion within the Expert Working Group Meetings regarding the requirements for the noise modelling methodology and would be interested to hear Cefas's views.
6.5.1.2	Natural England queries why has the data provided by the Joint Cetacean Protocol (JCP) not been used as a data source for marine mammals in Hornsea Project Four.
6.5.6.7	As mentioned in the Evidence Plan Technical Panel meeting, Natural England is content that reduction in foraging ability is scoped out as long as the potential impact on grey seal foraging (e.g. barrier effects or disturbance away from a known hotspot) is assessed, as the maps provided show a hotspot of seal activity to the NW of the site.
6.5.6.7	We note that operational noise has been scoped out. Whilst we have in the past been content to scope this out for smaller turbines in previous applications, with new proposals such as this one potentially considering turbines in excess of 8MW, (possibly significantly larger) we are concerned that the evidence base on which we can conclude operational noise is not significantly above background levels is not there. With this in mind, Natural England has been discussing the lack of evidence on operational noise levels of large turbines with others in order to develop a scope of work to gather that empirical evidence. We recommend that this remains scoped in until further evidence has been generated to show that the risk is low.
6.5.8.3	The sensitivity score for cetaceans has been set as medium. However, more evidence will need to be provided for minke whale. This paragraph states that most of the piling noise is low frequency, and minke whales are low frequency cetaceans (as per table 6-17). Therefore there is the potential for a greater sensitivity and impact on this species in terms of PTS and disturbance.
Section 6.6 – Offshore and Intertidal Ornithology	
General comment	Hornsea Project Four is the closest of the Round 3 offshore windfarms to the seabird colony at Flamborough & Filey Coast SPA, England's largest seabird colony. The Digital Aerial Survey (DAS) data collected by the developer indicates a significant presence of gannet, kittiwake, guillemot, razorbill and puffin within the Hornsea Project Four site, both during and outside of the breeding season. Accordingly, assessing the impacts of the proposal on this SPA is of the highest priority. As well as the 24 months data collected, we advise that the developer use data collected from tracking studies from Bempton Cliffs and other colonies, for example Langston *et al.* (2013) and Wakefield *et al.* (2017), as well as sensitivity analyses such as SeaMAST, to fully characterise the importance of the Hornsea Project Four site for SPA species.
General Comment	There is little mention of impacts during migration. This will apply both to migrating seabirds (e.g. gannets moving through the site in autumn and spring) and to migrating waterbirds travelling to/from breeding areas to winter in SPAs. This might particularly apply to waterbird features of east coast SPAs such as the Humber Estuary SPA, Hornsea Mere SPA, The Wash SPA, and the Greater

SR Section	Comment
	Wash SPA for little gull.
General Comment	We note the intention to scope out intertidal ornithology from the ES. Whilst some surveys indicate that the cable landfall area may be of relatively low value, Yorkshire Naturalist Unit records suggest that nationally-important numbers of sanderling can be present. We also note that the NEWS data seems to show a gap which overlaps the corridor to the south. We question whether it is appropriate to scope out intertidal ornithology without further data being made available.
General Comment	It will be necessary to see the precision of population estimates before being able to conclude that the stated minimum 10% DAS coverage is sufficient. We may request additional data (e.g. from any additional cameras on the DAS planes) are analysed where the precision around estimates is poor.
General Comment	We reiterate the need for clear evidence trail to scope out indirect impacts to birds. Where decisions to scope out indirect impacts on seabirds are made on the basis of assessments which have not yet been carried out or consulted upon (e.g. fisheries), our view is that it would be more appropriate to scope such impacts in.
General Comment	We do not agree that disturbance / displacement issues (in any period) requires only 'simple' assessment, particularly in the context of impacts on SPA waterbirds or seabirds. We also note that displacement effects from different phases of the development (especially construction – operation) should be considered cumulatively rather than in isolation.
General Comment	The potential impacts of construction and operational phase lighting from turbines and associated structures on offshore ornithology receptors (including migratory passerines) are not identified in the scoping report. We recommend that this issue is scoped into the EIA, with due regard given to OSPAR Guidelines to reduce the impact of offshore installations lighting on birds in the OSPAR maritime area (OSPAR Agreement 2015-08) (source: OIC 15/15/1, Annex 5) and a suitable protocol aimed at minimising potential impacts as far as possible developed.
General Comment	The potential for inter-related effects on offshore ornithology do not appear to have been robustly considered. For example, marine process impacts on the Flamborough-Helgoland Front have the potential to affect prey availability for breeding seabirds.
6.6.3.10	Please see Natural England's Hornsea Project Three Relevant and Written Representations regarding our position on the methods of data collection for that project.
6.6.3.15	There will be plenty of colony-specific data from Flamborough & Filey Coast SPA to inform the seasonal definitions for breeding features. We recommend that the developer contact the RSPB as the relevant colony managers. Natural England advises the use of the full breeding seasons set out in Furness (2015) rather than the 'migration-free' breeding seasons, unless compelling evidence to do otherwise is produced.
6.6.3.26	Little gull are not really mentioned except in "low numbers". The ES should present a more comprehensive assessment of the potential impacts on passage little gull, as 'snapshot' DAS may not detect main movements. Previous Hornsea projects have used the migratory CRM to consider such impacts, whilst Norfolk Vanguard have explicitly assessed the impacts to the Greater Wash SPA, now a fully classified site.
Table 6-25	Given the proximity of Hornsea Project Four to the Flamborough & Filey Coast SPA, and the potential for in-combination effects with other Hornsea OWF projects, we are pleased to see that barrier effects have been scoped into the EIA. The EIA should

SR Section	Comment
	consider barrier effects across the breeding season for relevant species, including adult guillemot and razorbill swimming with their chicks from the colony to offshore waters. The modelling work carried out by CEH for the Firth of Forth and Tay windfarms should be considered as a potential method to quantify the impacts of barrier effects and also displacement as regards SPA productivity and adult mortality.
6.6.7.3	Cable maintenance should be considered cumulatively with the construction and operation/maintenance of the array for sensitive receptors, such as Greater Wash SPA red-throated diver, rather than scoped out.
Table 6-24	Mitigating the impacts of operations and maintenance vessels on red-throated divers is likely to require more than selecting a route avoiding high concentrations of the species (though that is welcomed): other standard mitigation measures have been proposed and adopted for other offshore wind projects.
Fig 6.26	A buffer zone around the export cable corridor to assess red-throated diver disturbance will need to be used, as disturbance reactions to boats can occur at ~2 km. All available data sources should be used to characterise the use of inshore waters by red-throated diver and inform the likely impact to the Greater Wash SPA, for example the JNCC report informing SPA classification (Lawson *et al*. 2015), SeaMaST, and Marine Ecosystems Research Programme density maps. We note that the inshore waters to the north of the Greater Wash SPA (not surveyed in Lawson et al 2015), are also known to support appreciable numbers of red-throated divers in the winter.
6.6.8.3	Avoidance rates proposed by Cook *et al*. (2018) have yet to be accepted by the SNCBs. At present our advice is to use different avoidance rates, as outlined in Natural England's representations to PINS for the Hornsea Project Three. Also Natural England has outstanding reservations regarding the use of Furness (2018) for rates of nocturnal activity, and therefore request for this to form part of parameter variation in CRM. We wish to see results from the MSS stochastic CRM too, presented for comparison with Band model outputs. This matter will need considerable attention during Evidence Plan discussions
6.6.8.4 Table 6-26	Natural England provides advice on displacement rates in the joint SNCB note (2017). We do not agree with the approach to assessing displacement being proposed for Hornsea Project Three and those elements of it presented in the Hornsea Project Four scoping report. Again this will need to be discussed in more detail during the pre-application phase.
6.6.8.6	We have several issues with the PVAs used on previous Hornsea projects, outlined in Natural England's Relevant and Written Representations for the Hornsea Project Three examination process.

Annex 4 – Seascape and Visual Resources (Section 6.11)

SR Section	Comment
General Comment	Flamborough Head Heritage Coast (relevant section 6.11 p.281 to p.307) Natural England advises that there is the potential for indirect effects on the visual and seascape setting of Flamborough Head Heritage Coast (FHHC). We note in 6.11.8.4 that the potential for these effects have been scoped out due to distance and at 6.11.8.5 that the seascape covered by Hornsea Project Four is not designated or covered by a defined area. Whilst Natural England does not disagree with this conclusion we advise that evidence is provided in the ES which demonstrates that no adverse effect will result from the operational phase of the scheme on the seascape setting of this Heritage Coast. Our advice is based upon: • The ZTV diagram in Figure 6.61 (p.300) shows that for the turbine blades in the (1-30) and potentially (31-60) visibility categories cover or are abutting the FHHC. • The potential for the use of turbines with a maximum height to blade tip of 370m above wave height. We note the use of a 45Km visual buffer zone as recommended in the SHN 2017 Guidance at 6.11.2.1 (p.281) and that for Hornsea 4 this buffer has been increased to 50km. The SNH 45km buffer is based upon turbines of 150m+ in height. A possible turbine height of 370m represents a potential 145% increase on the parameters as set out by SNH. The distance between the western most edge of the 50km buffer and the eastern most point of the FHHC is approximately 15km. Therefore the 50km visual buffer proposed, which although greater that that recommended by the SNH guidance, may be insufficient in this instance as borne out by Figure 6.61. Reference is made at 6.11.3.19 (p.295) to paragraph 114 of the NPPF (2012). Planning policy in respect of Heritage Coasts was update in the 2018 revision of the NPPF. The update text at para. 173 now reads: 'Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character'. Flamborough Head does not fall within either an AONB or a National Park. We request therefore that an additional viewpoint is provided located at the most easterly publically accessible point of the FHHC and that a wireframe diagram is created and included in the ES. In addition that an appropriate assessment is provided which considers the potential for adverse effects on the special character of the FHHC and the implications of this for visual receptors i.e. people who visit the HC to enjoy the visual amenity provided by this defined landscape.

Annex 5 – Environmental Topics and Potential Effects Onshore (Chapter 7)

SR Section	Comment
General Comment	*Co2 Primary: Where practical the following sensitive sites will be avoided by the permanent project footprint: SSSI Units (dependent upon condition), Ancient woodland, areas of consented development, areas of historic landfill and other known areas of potential contamination'.* Development on land within or outside a SSSI which is likely to have an adverse effect on it (either individually or in combination with other developments) should not normally be permitted, in line with NPPF 175b. Ancient woodland is defined as an irreplaceable habitat, consideration should be given to NPPF 175. These designations are irrespective of condition, please see Natural England's standing advice regarding condition. https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#avoid-impacts-reduce-mitigate-impacts-and-compensate-as-a-last-resort. Sites should be avoided by the permanent and the temporary construction footprint, where possible. Natural England also advise that the temporary footprint of the project should also avoid impacts to designated sites wherever possible.
General Comment	Natural England notes that a number of the conditions are caveated with statements such as 'where practical' and 'where technically feasible'. We advise that until the project parameters are suitably defined to enable the practicality or feasibility of a proposed mitigation measure to be fully understood it is not appropriate to rely on these commitments.
General Comment	Natural England requests further clarification as to why 8 HDD crossings are required when only 6 will be utilised.
Section – 7.1 Geology and Ground Conditions	
Table 7-2	Natural England notes that only SSSIs with geological features have been considered in the context of 'geology and ground conditions'. Natural England advises that impacts on designated sites with biological interest that is linked to or dependent on the underlying geology and ground conditions (e.g. rivers) should also be considered. Consequently Natural England does not agree that this section provides a robust consideration of the impacts on designated sites.
Table 7-4.	**Damage to the coastline and impacts on coastal erosion: Construction phase**. NE note and welcome the intention to use HDD over open cut trenching, however, little information is provided in relation to this. Further detail should be provided regarding the feasibility of HDD in this area, the location and size of the exit pits, the potential need to cofferdam and if appropriate, access to the intertidal area, vehicle movements etc, before impacts can be scoped out.
Table 7-4	**Damage to designated geological SSSIs: Construction phase.** NE does not consider it sufficient to rely on commitment Co2 and the undertaking to 'where practical' avoid sensitive sites within the permanent project footprint to scope out this impact at this stage.

SR Section	Comment
	Firstly, whilst they lie outside of proposed cable corridor and working area, the sites continue to fall within the 'red-line boundary'. Consequently direct impacts cannot be fully excluded until the project plans are more detailed and have been subject to further refinement. Secondly, only the 'permanent project footprint' is referred to in this statement. This does not account for the fact that temporary works could lead to permanent or longer term impacts on the site. All impacts on designated sites need to be considered, irrespective of their duration. Thirdly, only direct impacts on the geological sites are considered within the table and indirect impacts have been omitted from consideration completely. All impacts on designated sites need to be considered, both direct and indirect.
Table 7-4	**Dewatering of trenches and excavations. Construction phase.** NE welcome that a baseline review and survey have been scoped in and advise potential hydrological impacts on SSSIs are assessed.
7.1.7.3	We welcome that route refinement during PIER will show Hornsea Four in relation to the SSSIs and demonstrate they have been avoided. NE advise that further consideration re the scoping in and out of impacts should be considered at this stage.
Section 7.2 – Hydrology and Flood Risk	
7.2	There is no mention within this chapter of the potential risks to hydrological functioning and quality of SSSIs. Hydrological impacts on designated sites should be scoped in. In particular, the indicative cable and temporary work areas cross the River Hull Headwaters SSSI, a chalk stream system, and include Bryan Mills Field SSSI, which has developed over a complex of spring heads. Consideration should be given to the inter-relationships between water source, water quantity, water quality and vegetation type in sites. NE advise that disturbance of watercourses: construction phase and operation phase are scoped in until the route is finalised and the water course crossing schedule and methodology has been developed further. Consideration should be given to SSSI Catchment Risk Zones/IRZ. https://magic.defra.gov.uk/Metadata_for_magic/SSSI%20IRZ%20User%20Guidance%20MAGIC.pdf We recommend that prior to the determination of the final route a hydroecologist is employed to survey the area, to check for seepages/springs and to review the functioning of SSSIs to avoid damaging habitats associated with the site. We advise that the PIER/ES considers how the placement of the route will affect surface and groundwater flow across any sites with a hydrological focus.
Table 7-7	**Changes in water quality: Construction Phase.** This has been scoped out due to mitigation Co25 and Co34. NE advise that water quality impacts on designated sites are scoped in and assessment is made based on site specific considerations, local hydrological considerations and linkages.
Section 7.3 – Ecology and Nature Conservation	
7.3	The onshore scoping document does not include reference to Internationally designated sites (Ramsar, SAC, SPA). NE advise that sites of international importance are scoped into the assessment in order to allow consideration of alone and in combination effects.

SR Section	Comment
	In particular the Greater Wash SPA, which overlaps with the potential landfall corridor, should be within the scope. Please see Section 2.3 of this response for further detail.
7.3.2	We note that the study area has been delineated by a 2km buffer around the indicative landfall area, cable route and substation search area. NE advise that the buffer should incorporate Impact Risk Zones (IRZ) for SSSIs. Guidance on IRZ can be found here: https://magic.defra.gov.uk/Metadata_for_magic/SSSI%20IRZ%20User%20Guidance%20MAGIC.pdf We would advise that the buffer is extended in order to include Internationally designated sites which may be effected by alone and in combination impacts.
Table 7-8	Table 7-8 states that data sources were interrogated within a 1km buffer around Hornsea Four onshore scoping boundary. Figure 7.7 identifies a 2km data search area.
Table 7-9	Relevant Ecology and Nature Conservation Commitments Co26. NE would wish to see a commitment to restore hedgerows in a timely fashion and in equal or better habitat quality to those removed in order to contribute to coherent ecological networks and Net Gain in line with NPPF.
Table 7-9	'**Co2 Primary** - Where practical the following sensitive sites will be avoided by the **permanent project footprint**: SSSI Units, Ancient woodland, areas of consented development, areas of historic landfill and other known areas of potential contamination, RSPB reserves, Local Nature Reserves, Local Wildlife Sites, Yorkshire Wildlife Trust Sites, National Trust Land, Listing Buildings and Scheduled Monuments. Where possible, unprotected areas of woodland, mature and protected trees (those with Tree Preservation Orders TPOs) shall also be avoided'. NE advise that the *temporary construction* stage project footprint should also avoid sensitive sites wherever possible.
Table 7-10	**Direct impacts on designated sites' Construction Phase.** NE welcomes the commitment within Co2 to avoid sensitive sites where practical. Designated sites within the potential landfall, cable and substation areas should however be scoped in until the final route location is chosen and engineering considerations are identified; this will allow a site specific assessment of hydrological and biological functioning of the habitats and species. We advise that the cable route and infrastructure should avoid designated sites, including local designated sites, in the first instance. If it is entirely unavoidable that the cable route will cross a designated site we would expect potential installation alternatives to be assessed as part of the PIER and appropriate survey and mitigation data be provided.
Table 7-10	**'Impact on great crested newt populations'**. The proposed cable route crosses areas known to support high numbers of great crested newt. NE welcomes the commitment to survey within the project footprint plus 250m. The surveys should identify any newt populations and areas of good or connecting newt habitat, within the potential corridor to allow for micro-siting and site connectivity at the landscape scale.
Table 7-10	Natural England has adopted standing advice for protected species which includes links to guidance on survey and mitigation which we hope you will find helpful and can be found on the Gov.uk website. We recommend a thorough assessment the impact of the proposals on habitats and/or species listed as Habitats and Species of Principle Importance' within the England Biodiversity

SR Section	Comment
	List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006.
Table 7-10	**Impacts on habitats: Operation Phase** "*Not significant. As discussed and agreed in principle with Natural England September 2018. See section 7.3.8.*" Natural England has not had the opportunity to comment on these meeting minutes and does not consider that this has been agreed. The effect of the disruption of habitats during the operation phase will depend on the habitat type, the area and frequency of disturbance. Would advise the impact on habitats during the operation phase is scoped in until final route has been selected.
Table 7-10	**Impacts on protected species: Operation phase** *"Not significant. As discussed and agreed in principle with Natural England September 2018. See 7.3.7.1"* Natural England has not had the opportunity to comment on these meeting minutes and does not consider that this has been agreed. Operation and maintenance activities of the onshore cable route could cause disturbance to protected species and merits further consideration.
Table 7-10	**Impacts on habitats: Decommissioning phase** *"Decommissioning of the onshore substation could lead to temporary habitat loss or degradation."* NE is unclear if a 250m buffer will be sufficient to provide space for a decommissioning area. The effect of the disruption of species during the operation phase will depend on the species, sensitivity , resilience, connectivity and frequency of disturbance. NE advise the impact on habitats and species species during the operation phase is scoped in until final route has been selected.
Table 7-10	**Impact on bat species: construction phase.** Welcome the commitment to standard mitigation e.g. use of directional lighting during night working and look forward to this being developed with a view towards Net Gain.
7.3.8.6	NE welcome that suitable opportunities to enhance the nature conservation interest of the site will be developed. We would wish to see a commitment to net gain incorporated in the project design, in line with NPPF.
Section 7.4 - Landscape and Visual Assessment	
7.4.36	Visual Receptors could include the England Coast Path and long distance trails, a cumulative assessment of impact should be included.
Figure 7.11	This could also include the England Coast Path
Section 7.6 – Land Use and Agriculture	
7.6	Soils should be considered in line with Paragraph 112 of the NPPF. The applicant should consider the following issues as part of the Environmental Statement: *1.* The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved. This may require a detailed survey if one is not already available. For further information on the availability of existing agricultural land classification (ALC) information see www.magic.gov.uk. Natural England Technical Information Note 049 - *Agricultural Land Classification: protecting the best and most versatile agricultural land* also contains useful background information.

SR Section	Comment
	2. If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed level, e.g. one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, i.e. 1.2 metres. 3. The Environmental Statement should provided details of how any adverse impacts on soils can be minimised. Further guidance is contained in the *Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites*.
Section 7.6 – Land Use and Agriculture	
7.7.8.3	Traffic and transport will assess the impact on PRoW and non designated access routes during construction, this should include the England Coast Path.
Section 7.8 – Noise and Vibration	
7.8	Noise and Vibration. Consideration should be given to noise levels and timings with regards noise sensitive receptors including designated sites and protected species. For example, the River Hull Headwaters SSSI supports a diverse breeding bird community and therefore consideration should be given to the degree and timing of disturbance of species.
Section 7.9 - Air Quality	
Figure 7.15	Welcome that SSSIs have been mapped as Sensitive Receptors and would wish to see this reflected in PIER.

Annex 6 – Marine Conservation Zone Screening (Annex F)

SR Section	Comment
General Comment	Natural England's previous comments regarding commitments should be considered here. Until it can be clearly demonstrated that the cable route and working area does not directly interact with the features of the sites, direct impacts should not be scoped out of the MCZ assessment.
2.2.1.4	Natural England advises that it needs to be clearly demonstrated why the assumptions made in relation to other projects are appropriate in the context of Hornsea 4.

THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

HORNSEA PROJECT THREE OFFSHORE WIND FARM

EN10080

Annex E: Offshore wind cabling: ten years experience and recommendations

7 November 2018

Natural England Offshore wind cabling: ten years experience and recommendations

July 2018

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Natural England: Offshore wind cabling: ten years experience and recommendations

Summary

This note documents the experience Natural England has gained from advising on the environmental impacts of power cable installation over the last ten years, and to highlight where issues have arisen with both installation and maintenance that have caused concern for nature conservation. Annex 1 provides some detail of cases where impacts have occurred. In many cases the works resulted in habitat disturbance and loss/ change within MPAs that had not been assessed as part of the application, requiring additional work by the developer, regulator and advisors. Due to the experience we have gained relating to the actual impacts on the ground, we regularly find ourselves disagreeing with, or questioning developers' assessments of likely impacts of cabling works. This note provides evidence for our current advice to industry and regulators on offshore wind cabling activities and explains where our current concerns with regards to impacts from cable installation have stemmed from. It seeks to emphasise that better solutions can and should be found for both the environment and for the offshore wind industry, which should also result in time savings for all parties post consent.

In particular it makes recommendations for the industry to: avoid cabling in sensitive/protected habitats; to change the way impact assessments are carried out so that they are more rigorous in the data collected and the emphasis placed on the likely range and scale of likely impacts through the lifetime of a cable; to be more realistic about the evidence gaps and the limitations in installation technology avoiding over-optimistic engineering predictions that are unable to be delivered on the ground; to invest in greater levels of detail in information collection and project design at earlier stages of the project; to consider mitigation at much earlier stages of a project planning and for monitoring to improve the evidence base on cable installation impacts and the recovery from these.

Contents

1. Introduction

The offshore wind industry has grown in the UK over the last 15 years from initial installations of 30 turbines at Scroby Sands and Kentish Flats to the more recently consented projects at Dogger Bank of up to 400 turbines. Related to this there has been a step change in the amount of cabling activity to much higher numbers and lengths of inter-array and export cables needed to service these projects. This has necessarily led to interactions of cables with a wider range of substrates and associated habitats and species, and the need for differing installation techniques, successful or not.

At the same time as this period of offshore wind development there has been a large increase in the number of Marine Protected Areas (MPAs) designated (from around 16% of inshore English waters designated in 2009 to 38% by 2016) leading to much greater interactions between cabling activities and designated sites.

The limitations in availability of grid connection on land has led to cables from more than one project coming into the same or nearby areas leading to increased pressure on the habitats and species in those locations.

2. Offshore wind cable history and evolution

In the early offshore windfarms with small numbers of turbines located close to shore there were multiple export cables transmitting at 33kV. With the development of larger windfarms further from shore the use of offshore substations to step up voltage has become standard and transmission is now at 130 -150kV HVAC. The table below gives figures for the cables from some sample developments to illustrate the change in scale of cabling associated with offshore windfarm development.

Windfarm	**Year of operation**	**Number of turbines**	**Number of export cables**	**Export cable length per cable (km)**	**Inter array cable length (km)**	**Area of seabed impacted m^2**
Scroby Sands	2004	30	3	4.2	20	
Kentish Flats	2005	30	4	9.4	21	136,000 export 80,000 inter-array
Greater Gabbard	2012	140	3	45	175	
Hornsea 1	2019	332	3	142	450	6,000,000 export 4,500,000 Inter-array

Projects currently in pre planning (e.g. Hornsea 3) are proposing to use 6 export cables per project. Thus it can be seen that there has been a significant increase in the length of cable

installed in the marine environment in relation to offshore wind in the last 10 years with many more to come as those Round 3 projects consented and in planning move into construction.

HVDC cable technology becomes more viable with increased distance from installation to shore. It has yet to be used for offshore wind in the UK due to costs (although there are applications being submitted using this technology) but could result in overall benefits to the environment. Although its use would potentially require more offshore infrastructure due to the need for collector and conversion stations and larger onshore converter substations, depending on the project design there is potential for fewer cables to be required offshore in a HVDC system which would be of benefit in reducing interaction with the marine environment and thus potentially negative impacts.

3. Impacts from cable installation and related concerns for nature conservation

It is usual for an Environmental Statement to assess at a high level the impact of cable installation by a possible four methods: ploughing, jetting, trenching/ cutting and vertical injector with either simultaneous lay and burial of the cable or laying of the cable by a surface vessel and then subsequent burial using another device. Cable installation tools are either towed by a surface vessel or self-propelled. Prior to cable laying, grapnel runs are carried out and boulder and UXO clearance may be necessary to clear the route for the installation tool/ vessel. More recent applications have assessed sandwave clearance, which may be required to reduce the slope/ flatten the seabed to achieve more optimum burial and enable installation tools to operate. Cable protection in the form of concrete mattresses, rock placement, grout or sand bags or frond mattresses is essential at cable crossings and may be required in other areas where optimum burial depth cannot be achieved (even after repeated attempts to bury the cable). All this information is used to calculate the area of seabed that may be impacted by the worst case scenario installation method (usually that with the biggest footprint). A description of the typical cable installation process can be found in the Offshore Wind Programme Board Overview of the offshore transmission cable installation process in the UK.

Cables associated with the early Round 1 windfarms were typically installed by plough in soft sediment environments (mud and sands). Advice from Natural England was that cabling was a one off activity leading to temporary disturbance of the sediment and habitat and that due to the nature of these habitats, which are generally tolerant to disturbance, there would be recovery of the sediment and associated fauna within relatively short timescales (less than a year). However, experience gained over the last 10 years has shown that cable installation is often not a one off activity, (with maintenance and repair works, cable reburial, additional cable protection or even replacement of cables/cable sections now frequently needed), and additionally that the installation techniques proposed in Environmental Statements are often found not to be feasible once ground conditions are better understood and contractors are on-board. With the increase in scale of cable installation, many different habitats are being impacted that have less potential for recovery/slower recovery rates than those more robust sediments of the earlier installations. This has led to greater impacts on marine and coastal habitats and species than those assessed at the time of consenting, effectively rendering the assessments in the Environmental Statement inadequate.

Dealing with these issues post consent when a project is going into construction has led to difficulties and frustration on the part of advisors, regulators and developers. At this stage

supply chains are often in place leading to relatively few options to change or minimise environmental impacts due to cables, contractors and vessels already being procured. Additionally, developers are under pressure to meet contractual timescales for installation leading to changes to proposals occurring in tight time frames, which passes the pressure on to regulators and their advisors. There may be a requirement for new Habitats Regulations Assessments or MCZ assessments to be undertaken at short notice[1]. Where works may now lead to a significant impact, potential adverse effect or hindering of the conservation objectives[2] of an MPA it can be challenging to find solutions that enable cables to be installed within the time constraints while avoiding the detrimental impacts. This has led to great impacts than were considered at the consenting stage, and a risk of failing to protect designated MPA features. Better outcomes could be gained for the project and environment through more realistic consideration of the issues at the consenting stage. We recognise that at the consenting stage it is outlined to the developer that any deviations from that which is consented is at the developer's risk, but in reality the risk is shared across all interested parties including government.

4. Pressures and impacts from cable installation

Information on feature specific pressures exerted by cable installation can be found in the advice on operations for the relevant MPA. An example for Margate and Long Sands SAC can be found here:

The key pressures of concern in relation to cable installation are:

- Abrasion/disturbance of the substrate on the surface of the seabed
- Changes in suspended solids (water clarity)
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Smothering and siltation rate changes (Light)
- Physical loss (to land or freshwater habitat)
- Physical change (to another sediment types)

In harder substrate environments there may be loss of habitat due to the cable installation. Additionally where sandwave clearance or cable protection are proposed or used there are additional pressures relating to dredging of large volumes of material or loss of/ modification to habitat under hard rock placement. In an MPA designated for a species e.g. birds there are additional considerations relating to the disturbance caused to the species as well as any habitat they may rely on. Other pressures are associated with the infrastructure used for

[1] An appropriate assessment may be required under regulation 63 of The Conservation of Habitats and Species Regulations 2017, or an MCZ assessment under the Marine and Coastal Access Act if the activity is likely to have anything other than an insignificant impact on an MPA and these impacts have not previously been assessed or sufficiently assessed as part of the consenting process.

[2] If an activity is deemed to have an adverse effect on an SAC or SPA or hinder the conservation objectives of an MCZ then that activity cannot be permitted unless it can be shown that there are no alternatives, that it has imperative reasons of overriding public interest and that suitable compensation or measures of equivalent environmental benefit for the damage can be implemented. To avoid these levels of impact operations must be carried out in a manner, with suitable reduction, avoidance and mitigation of impacts so as not to cause an adverse impact on an SAC or SPA or hindering of the conservation objectives of an MCZ.

cable installation such as anchor placement of vessels, beaching of vessels nearshore and requirements for boulder and UXO clearance along cable routes.

The impact of these pressures on an MPA, and Natural England's level of concern regarding them, then relates to:

- the magnitude of the pressure (e.g. number of cables to be installed and footprint of the installation method)
- the duration of the pressure (how long cable installation will realistically take as well whether the impacts from the operation are temporary)
- timing of the installation in relation to sensitive periods
- and the sensitivity and recoverability of the habitat or species in question.

For example ploughing a cable into highly mobile sands and chalk bedrock may have the same footprint, but the two habitats will recover very differently. The highly mobile sand habitat will be less sensitive and recover more quickly than the chalk bedrock which may take much longer to recolonise due to the species present and does not have the ability to recover morphologically.

5. Experience gained from cable installation to date

As discussed above, there are several reasons why cabling activities and our advice relating to them has evolved over the last ten years. This is largely due to the experience that has been gained post consent when projects move into construction. At this point it has regularly been found that different or previously unknown impacts arise that have not been assessed, or sufficiently assessed, as part of the consenting process. This results from over confidence of the applicant in their ability to install cables, over optimistic expectations of engineering solutions to complex problems or a lack of understanding of the complex marine substrate and ground conditions. In many cases changes to cable installation techniques, remedial works and additional cable protection have resulted in habitat disturbance and loss/ modification within MPAs that had not been assessed as part of the application, requiring additional work by the developer, regulator and advisors. It is therefore imperative that assessments are improved at the consenting stage in order that regulators and advisors are confident that a deliverable installation method has been proposed and a realistic level of impacts has been assessed in order to avoid these issues arising later. As highlighted in the Offshore Wind Programme Board paper (Overview of the offshore transmission cable installation process in the UK), earlier involvement of the right expertise for cable installation and burial planning would help to alleviate some of these issues by ensuring that more accurate methods statements are submitted, leading to consents that have considered the full potential range of situations that may be encountered for that project. This should be complemented by detailed survey data to inform decisions related to ground conditions ("past experience of installation issues resulting from unexpected seabed conditions serves to underline the importance of effective and early survey planning"). Feedback from insights gained on previous projects is also a fundamental requirement currently receiving insufficient attention by the sector.

The following list highlights some of the key issues that have arisen, which are explained in more detail in Annex 1 with examples. Although we understand that some of these issues

may have been unavoidable, with current knowledge they should be assessed and mitigated for if needed at application stage.

- Changes to assessed cable installation methods due to more information becoming available post consent/ techniques not working in the field
- Predicted range of impacts/quantities, even after post consent revision, still not fit for purpose when compared to actual installation impacts
- Cable installation in a wider range of substrate types/ habitats
- Insufficient cable burial depth achieved in practise
- Cables becoming exposed and free spanning cables
- Secondary scour around cable protection and at cable crossings
- Need for additional cable protection due to above 3 reasons
- Installation/ repair timetable falling behind/ over running requiring work in sensitive periods for certain species
- Additional need for jointing pits/ flotation pits
- UXO/ boulder clearance with the actual number of UXO targets often far exceeding that assessed
- Pre-sweeping/ sandwave clearance
- Need for cable repair/ replacement
- Annex 1/Saltmarsh impacts – subject of another paper

6. Content of an assessment of cable impacts

The following points are made in the National Policy Statement for Renewable Energy Infrastructure EN-3 (section 2.6.113) and must be considered along with the additional detail below:

'Where necessary, assessment of the effects on the subtidal environment should include:

- *loss of habitat due to foundation type including associated seabed preparation, predicted scour, scour protection and altered sedimentary processes;*
- *environmental appraisal of inter-array and cable routes and installation methods;*
- *habitat disturbance from construction vessels' extendible legs and anchors;*
- *increased suspended sediment loads during construction; and*
- *predicted rates at which the subtidal zone might recover from temporary effects.'*

Natural England advise that a full assessment in an application sh**ould include:**

- Detailed information on ground conditions and clear evidence of the likelihood of success of proposed burial techniques in those conditions. Currently these are usually provided in a cable installation plan post construction which can be too late in the process where sensitive habitats and species are likely to be impacted. There needs to be a *very* realistic worst case scenario (WCS) based on engineering knowledge and experience and an alternative installation plan/technique should the ground conditions be unsuitable for the preferred method. Although this might mean a wider cable installation envelope and a '*worse'* WCS, there is a need to be more precautionary as a result of negative experience with a number of existing projects. Should the developer wish to have a more defined WCS – ground investigations and

associated data need to be presented at the application stage rather than post-consent. (This also relates to the next point below).

- Changes to assessed cable installation methods due to more information becoming available post consent/ techniques not working in the field. The Offshore Wind programme board paper states '*Contingency measures should also include plans for approvals of necessary changes to the installation methodology as, in the past, projects have needed to make late changes in response to unforeseen seabed conditions or weather changes while the vessel is on-site*.'

- Impacts related to bringing vessels inshore (associated beaching or floatation pits)

- An assessment of likely post-construction issues including the potential for cable exposures, scour, secondary scour and an assessment of the expected WCS for associated remedial work as a contingency to future proof applications. This should include any needed change to installation techniques for this work as detailed above.

- Assessment of impacts of realistic number of cable repairs or replacements using information gained from previous developments

- Realistic predictions of the amount of cable protection (including height, width, length) and the type of cable protectionto be used along with an assessment of the impact on habitats and species at the required locations. Consideration should be given as to whether this leads to habitat loss and whether it will be conditioned to be removed on decommissioning. The assessment should include the proposed locations of cable protection rather than a generic amount along the route with specific assessment of the impacts of areas on habitats within MPAs. An assessment of potential impacts to physical processes should also be undertaken to look at potential impacts to sediment transport which may impact habitat extent and quality.

- A realistic assessment of the number and impact of cable grapnel runs, UXO, boulder and sandwave clearance where relevant with a clear indication of the temporal nature of these impacts.

- Realistic worst case scenario predictions of area of each relevant habitat type/ species impacted along with realistic assessment of recovery. Evidence from developments of similar scale and in a similar habitat should be analysed and presented. The assessment should also refer to sensitivity and recoverability information that is provided in the most up to date Conservation Advice for each feature.

- An assessment of how the above predictions relate to the conservation objectives of any relevant MPA

- Proposals for monitoring and remediation/ alternatives, particularly where installation techniques and their impacts on designated features are unclear. Where monitoring is required to inform remediation the methodology should be agreed with relevant bodies to ensure the future surveys are fit for purpose.

7. Mitigation[3]

Cabling can have low environmental impacts if the operation is carefully planned and appropriate mitigation is put in place. The standard approach of 'avoid, reduce, mitigate' should apply where firstly impacts, particularly on a sensitive feature, should be avoided. If this is not possible then impacts should be reduced by selection of appropriate methods and finally any remaining impacts should be mitigated for. Mitigation for benthic impacts in the National Policy Statement for Renewable Energy Infrastructure EN-3 (section 2.6.119) includes the following points:

'Construction and decommissioning methods should be designed appropriately to minimise effects on subtidal habitats, taking into account other constraints. Mitigation measures which the IPC should expect the applicants to have considered may include:

- *surveying and micrositing of the export cable route to avoid adverse effects on sensitive habitat and biogenic reefs;*
- *burying cables at a sufficient depth, taking into account other constraints, to allow the seabed to recover to its natural state;'*

There are a variety of ways to minimise or mitigate impacts of cable installation and routing including:

- Micro-siting/routing, modification to the route to minimise interaction with sensitive features is important and commonly done either directly by developers or after consultation with Natural England. For micro routing to be successful post-consent it is necessary to ensure there is sufficient cable to do so, which can be an issue in relation in terms of timing of surveys to inform procurement and also taking into account technical logistics of bending a cable.
  Examples of where route selection has worked successfully are at two windfarms which needed to address the impacts of bringing cables ashore through areas supporting reef habitat in and outside of MPAs. At the first windfarm, during the pre-examination phase there were a number of cable options which were reduced down to the preferred option. Part of this options review process was to undertake habitat surveys of the cable routes followed by a review of the habitat sensitivity to assist with route selection. One of the main reasons for not choosing one option was the presence of stony reef. The other project had a large cable corridor consented and the habitats were surveyed within the full cable corridor to identify presence of reef habitats with the intention of micrositing/positioning the cable around reef. In the end, whilst the only reef found was not located along the preferred cable route and therefore impacts were avoided.

- Carefully selecting techniques for burial to reduce sediment plumes or avoid features can be very helpful. Horizontal directional drilling (HDD) can be used in some circumstances to fully avoid sensitive areas. For HDD to be considered as viable, pre-consent geotechnical investigations are required to confirm what is achievable. Undertaking these investigations will require a Marine licence and/or planning

[3] Adapted from Natural England Submarine Cables Handbook – internal document

consent.

- Avoiding sensitive times of the year can completely avoid a potential impact. For example, avoiding nesting and overwintering periods for birds, or times of the year when the feature is present.

- When cable protection is needed, materials can be selected to match the environment (when on mixed sediment or cobbles, rock of similar diameter and material as the receiving environment should be used as an alternative to the current blanket approach of sourcing granite from Norway).

- Where cable protection is needed it is also important to pay attention to the sand wave field in the area surrounding the rock amouring/placement location. The rippling in the sand in the wider area can show how mobile the area is and the sediment transport direction. Where possible, cable protection in a dynamic environment should not be placed perpendicular to the sediment transport (i.e. the long side of the rock protection should not run at angles close to parallel with the ripple crests) as this can result in large scour pits. If this is considered necessary then the associated issues highlighted above should be considered and addressed as part of the application. Similarly the placement of cable protection at 90 degrees to near shore sediment transport pathways is to be avoided as it can affect downstream sediment transport. The report undertaken for one windfarm projects showed that cable protection within the 10m depth contour could cause disruption to longshore sediment transport such that it may cause a breach at Spurn Point.

- Sandwave clearance is undertaken to avoid exposure of the cables in the future, but there is currently insufficient evidence as to the impacts and effectiveness. Its use therefore needs to be carefully considered, and where possible avoided in an MPA as in many cases the volumes dredged can be very large. As with any activity the 'avoid, reduce, mitigate' hierarchy should apply. Early discussion with Natural England is recommended as our advice will depend on the location. Depositing of any dredged material should be at a location that enables it to remain within the sediment system. We advise that any sediment extracted should be deposited up stream of cable trenches to encourage natural backfill.

8. Recommendations

Natural England therefore consider that cable installation, repair and maintenance have the potential to impact the natural environment in a significant way and have the following recommendations:

i) Cables should be routed away from sensitive habitats wherever possible e.g. those in which damage due to installation would be permanent, recovery slow or the habitats and species are rare or of high environmental value such as *Sabellaria spinulosa* reef, saltmarsh and chalk reef.

ii) The number of cables per project should be minimised through project design.

iii) Cabling in dynamic mobile sediment environments should be carefully considered (in project design) to avoid cable exposures occurring and subsequent additional cable protection being required.

iv) Cabling should not be assessed as a one off activity and a full assessment should take place at consenting stage of the cumulative impacts of cable installation and maintenance including the impacts of related cable protection and remedial/ repair works once operational.

v) Every effort should be made to use (or gain where there is a concern) pre-application geotechnical information to inform a realistic assessment of cable burial tools and options and their impacts as part of the consenting process. This should avoid the need for changes to the methods assessed in the Environmental Statement when a project moves into construction.

vi) Where there is any doubt as to the feasibility of installation this should be clearly communicated, particularly where there is interaction with an MPA. In this situation it may be useful to consider a wider range of techniques or other possibilities in order to ensure the worst case scenario is fully covered and impacts on the MPA can be assessed. Based on previous experience Natural England will take a precautionary approach in its advice on consenting in sensitive habitats where there is uncertainty around the impacts.

vii) Taking account of worst case scenarios and gathering the necessary level of information at the point of application may be at considerable cost to the developer but can be offset by the reduced risk post consent of having to develop bespoke techniques/kit at very short notice. Additionally there is a large time cost (with associated financial implications) post consent to all parties through consultation on changes which could be saved.

viii) Conditions and discussions relating to cable installation and maintenance, with the detail behind them, should be clearly documented through the consenting process in order that the understanding and background is retained into construction of a project through any personnel changes in all parties.

ix) Where it is not possible to avoid an MPA and impacts are likely to be significant, early consideration of IROPI and compensation or measures of equivalent environmental benefit may well be the best option for the environment and project.

x) If we consider that insufficient information has been provided or inadequate assessment of the potential range of impacts, Natural England may advise that the application is inadequate and not fit for submission

xi) Monitoring of the impacts of and recovery from cable installation and repair has not been sufficient in many sediments/ habitats to provide an evidence base to advise on the impacts to sensitive habitats with confidence. Therefore until this evidence base is improved monitoring of export and inter-array cable installation impacts and recover should be implemented as a marine license condition.

9. Annex 1: Examples of impacts from cable installation and operations and maintenance

A1 Insufficient cable burial depth achieved in practice

At a number of windfarms it has not been possible to achieve the burial depth proposed in the Environmental Statement due to a combination of local ground conditions and inability of the tools to operate effectively in those conditions. In some cases this does not cause problems i.e. reburial attempts are successful or, as in other cases, the cables are left without further remedial work to bury the cables. However, in many areas this has led to repeated attempts to bury cables using the same or different tools, or the need for remedial cable protection due to risks to the cables and other sea users. In an MPA or a sensitive area the consequences of this can be repeated abrasion and disturbance to a habitat for which only one off disturbance was assessed and similarly further increases in suspended sediment. Where the habitats and species are sensitive to these pressures then prolonged disturbance increases the magnitude of the effects beyond that assessed at consenting. Impacts of additional cable protection are covered in Annex 2.

Examples:
At one site it was proposed to use stone bags in areas of insufficient burial to provide further protection to cables and a marine license was subsequently granted for this although ultimately the stone bags were not used.
At another offshore windfarm it was initially attempted to bury the inter-array cables using a plough which was not sufficiently successful. Following this a jetting tool was used, although this was also not sufficiently successful after a number of passes. Ultimately rock placement was required to ensure the integrity of the cables.
Elsewhere a mass flow excavator (extreme jetting tool) was used with some success to rebury cables. This posed more of a challenge in mixed sediments (presenting a harder substratum) than in softer sediments. Additional cable protection within an MPA that was not assessed at the time of application has subsequently been requested at this site.
At another site optimum burial depth was forgone in recognition that by cutting into the chalk bedrock to install the cable the bedrock provided appropriate protection to both cable and other sea users.
Two interconnector cables have applied for additional cable protection in MPAs that was not assessed at the time of application due to insufficient data being collected and used to predict burial depths and therefore ground conditions in reality differing to those that were assumed.

A2 Cables becoming exposed

Cables can become exposed either due to initial insufficient burial as detailed above or due to burial in mobile sediments which then migrate leaving the cables exposed. Impacts are similar to above where either reburial or additional cable protection is required. In the last couple of years sandwave clearance has been proposed and used in mobile sediment environments. This is covered in a separate section below.

Examples:
Since installation at x windfarm the majority of the export and inter array cable located within

the sandbank system have been exposed and free spanning and in other areas buried to depths >9m.This is due to the migration of the sand bank system south eastwards into the North Sea. However, nothing has been done to address the exposed cables.
At several windfarms cable exposures occurred requiring rock armouring in places. At one development surveys showed 16 exposures on export cable route and 29 on inter-array cables which required some remedial cable protection. At another a number of short exposures were observed. Additional jetting was required to remediate this with rock placement on exposed sections of the export cable. At a third site 77m export cable became exposed this was not considered a large impact and no remediation was required.

A3 Scour and secondary scour around cable protection and at cable crossings

Scour and secondary scour are of concern due to the potential to cause further destabilisation of the sediments and thus the further requirement for more remedial work. By their nature they will lead to additional abrasion, disturbance and impact on form and function of a habitat that has not been assessed as part of an application.

Examples:
At the crossing of a windfarm export cable and an interconnector cable, the cables became exposed due to their installation close to the edge of a dynamic sandbank. Remedial works were undertaken using locally sourced sand and gravel but were unsuccessful in keeping the cables buried. Further works were undertaken using rock armouring which then required an additional phase of works due to scour around the edge of the rock amouring. All of these works resulted in habitat disturbance and loss/ modification within MPAs that had not been assessed as part of the application, requiring additional work by the developer, regulator and advisors.
In a different location significant scouring of the seabed has occurred as a result of rock armouring placed over the export cable, with scour pits occurring which are deeper and cover a wider area than originally predicted (one pit is over 5m deep and 200m in length). Large areas of free spanning cable are also exposed. A cable scour remediation project has been implemented since the 2015 surveys were undertaken, resulting in rock placement around many of the shallow buried and exposed cable areas
Monitoring has shown that the level of impact from scour protection is influenced by its orientation in relation to local sediment transport patterns. In this instance the rock berm was placed perpendicular to the local sediment transport field (parallel to existing ripples) leading to the creation of scour pits several orders of magnitude larger than the rock berm. This in turn leads to greater than predicted impacts in terms of further habitat loss and disturbance. These impacts could be minimised whilst still protecting the cable by orientating the scour protection differently in line with local sediment transport patterns. As described in a previous section where this is not possible due to the cable orientation then the secondary impacts should be considered, assessed and addressed where necessary.

A4 Need for additional cable protection due to above 3 issues

Impacts of additional cable protection are covered in Annex 2.

A5 Changes to cable installation technique

This occurs where either new geotechnical information becomes available post consent and it is discovered that the techniques assessed at the time of consenting are now not sufficient

to bury the cable, or new technology has come along since consenting that is more appropriate to the cable and the environment in which it is being installed. Where the impacts from the change to technique are within the parameters of those assessed at the time of consenting the change may not be problematic (although still requires time on the part of developers, regulators and advisors). Issues can arise where the change in technique impacts on an MPA, further assessment and potentially mitigation is required depending on the level of effects. As highlighted earlier the Offshore Wind programme board paper states '*Contingency measures should also include plans for approvals of necessary changes to the installation methodology as, in the past, projects have needed to make late changes in response to unforeseen seabed conditions or weather changes while the vessel is on-site*.'

Examples:
As described previously, at one site the installation technique was changed to using a mass flow excavator for the second cable installation which has wider and deeper impacts than those assessed under jetting in the ES. There was also remedial burial for the first cable using a mass flow excavator where the original techniques did not achieve optimum burial depth. The mass flow excavator had a 15m impact width, three times greater than the cable corridor width assessed in the ES. Use of the tool also raised concerns about increased suspended sediment concentrations, loss of fines when backfilling the material, impacts of stockpiling material and backfilling techniques and subsequent recovery of the habitat. Lack of evidence on the impacts of the technique meant that a greater level of monitoring of recovery was required, some of this showed persistent grooves in the seabed where stockpiled material was dredged up and non uniform recovery.
At another site the installation technique was changed from a plough to a cutter to enable cable installation in the chalk.
To install the export cable at another windfarm a mass flow excavator was used which was different in impacts to the original project installation and assessment.

A6 Installation/ repair timetable falling behind/ over running requiring work in sensitive periods for certain species

To mitigate for impacts on species in sensitive periods, such as feeding or roosting birds or migrating and spawning fish, timing restrictions may be included as a marine license condition. Where changes occur to the application prior to commencing construction, installation works over run or run into sensitive periods then disturbance is caused to these species that was not assessed as part of the original application, or was assessed and thought not to require mitigation measures. This leads to difficult decisions for advisors and regulators, and potentially long construction delays for developers, where works need to be completed whilst avoiding detrimental impacts on the species.

Examples:
At a windfarm the developer needed to reinstall their cable in the inter-tidal during the seasonal restriction for over-wintering birds in an SPA. A new appropriate assessment was required as this had not been previously assessed and there were large numbers of birds using the areas. Consequently a package of mitigation measures was agreed to enable the repairs to go ahead. This included minimising vehicle movements, marking a limited working corridors, no night working /lighting, cold weather restrictions and no coastal working practices 2 hours either side high tide. In addition to the mitigation measures the developer

aimed to reduce overall disturbance in the site by reducing recreational disturbance in the area, including making educational signs and leaflets and funding an extension of the local natural ambassadors programme where people were present on the foreshore to educate people on the impacts of bird disturbance.
At another windfarm the cable installation took longer than predicted, over running the end of the consented working window. Emergency real time judgments and assessments had to be made, in relation to whether or not the installation work in the intertidal could be completed or halted with the cable tied off until the following consent window. It was determined at that time that both options would be significant, and this put everyone under considerable pressure. In the end, the fair weather conditions meant that completion of the installation was the least worse option.
Similar issues were encountered at two more windfarms where construction windows over ran or additional work was needed requiring works to impinge on restricted periods.

A7 Pre-sweeping/ sandwave clearance

As discussed above, in areas where there are sandwaves and megaripples it may be difficult to achieve optimum burial depth and slopes may be too steep for cable installation machines to operate on (>15 degrees). The technique involves dredging the tops of the sandwaves (usually using a trailer hopper suction dredger or mass flow excavator) in order to install cables in a flatter area where machines can operate and cables are less likely to become exposed. Local levelling of smaller features by dragging a plough across the area has also been proposed. Dredged material is disposed of in a licensed area. To put it in context the figures proposed for dredging at a windfarm site are similar to those extracted from a medium sized aggregate extraction area in a year, therefore the proposed operations are not insignificant volumes (one windfarm applied for 541 600m^3 for dredging over inter-array and export cables – an aggregate extraction license can be from around 83 000m^3/year to 1 000 000m^3/year). However the difference in impacts between aggregate extraction and sandwave clearance are that aggregate is extracted in a discrete area and removed from the system, whilst sandwave clearance may be over a larger area if it includes an export cable route and the material can be retained within the system depending on how and where it is disposed of.

As these works have only been proposed and carried out relatively recently there is currently no evidence on how well this technique works, whether cables remain buried thus avoiding the need for additional cable protection, and how quickly dredged areas recover. A number of projects have applied to undertake sandwave clearance post consent, however forthcoming projects should fully assess the impacts of any likely sandwave clearance at the time of application in order for the application to be complete. Full consideration needs to be given to the volumes to be dredged, areas for disposal of dredged material and impacts on the benthos and sediment transport. Natural England advise that, until further evidence is available on its efficacy as a technique and the timescales for recovery, sandwave clearance should be avoided within MPAs due to the potential impacts. Additionally, in any sandwave clearance assessment we advise that it is best practise to deposit the material upstream of the extraction site to enable natural processes to work the material into the area as quickly as possible and reduce impacts.

A8 Floatation pits

Floatation pits have been required at one offshore windfarm to enable the cable installation barge to get close to shore. It is usual for a vessel to be brought in close to shore and often to beach on nearshore or intertidal soft sediments. In this instance it was not possible to find a vessel that could beach on the harder substrate close to shore. Therefore, to enable the installation vessel to operate in the shallow water near to the cable landfall an application was made to dig 6 floatation pits (each 160m x 45m and 3m deep) with an excavator, which allowed the installation vessel to remain floating at low tide and avoid being beached/grounded on the harder seabed surface. Once cable installation works are completed the pits will be infilled with the material that was excavated, however as excavation was in chalk bedrock the habitat is unable to recover geologically, although it may recolonise in a similar manner to what existed previously. Ongoing monitoring should inform the extent of the impact and recovery and thus any similar future situations. These activities were not assessed as part of the original application. This case occurred outside an MPA – within an MPA it may well have been difficult to avoid an adverse effect or hindering of the conservation objectives of the site. The consequences of this level of impact on a designated site are that the features are damaged and thus less resilient to further impacts. This may in turn lead to impacts from future activities being assessed with increased caution and considered unacceptable or less acceptable as well as impacting on the condition of the feature or site (e.g. the feature may become in unfavourable condition).

A9 Jointing pits /HDD exit pits

Horizontal directional drilling (HDD) is often chosen as the cable installation method at landfall. Although normally more expensive than other methods it can be a useful tool to avoid sensitive intertidal areas or minimise disturbance during construction. HDD cable installation usually starts on land and follows seawards, where the installation tool has an exit pit at the seabed in shallow water. In order to bring the tools back to the surface and to join the cable to its offshore portion an area of seabed needs to be cleared and levelled so excavation works may be required. In one recent windfarm consultation, the size of one such exit pit was estimated at 1500 m^2 with the depth of excavation of up to 4 m. Taking into account that there may be multiple cables installed for a project, the total area subject to habitat loss and disturbance may be quite large. The impact longevity will depend on the nature of the seabed material and sediment transport processes in the area. The significance of impact will depend on the conservation status of the area and sensitivity of the habitats. Similar impacts could be expected from jointing pits where sections of a cable or multiple cables are connected. The impacts from clearing and excavating large areas for the purposes of cable jointing works need to be carefully assessed alongside other cable installation impacts at the time of application.

Example:
At one windfarm, following detailed design of the joint pit requirements the developer identified the need to increase the maximum dimensions of the joint pit for the second cable from approximately 250m in length to up to 600m. This was necessary in order to provide a sufficient grade in / grade out area at the point that the cable enters and exits from the pit, taking account of operational constraints such as water depth and the technical limitations of the cable burial process. With a width of 25m, the estimated seabed footprint of the joint pit excavation increased from 8,899m^2 to 18,750m^2, including a 25% contingency.
Overall NE were content that given the location and temporary nature of the effects of using Mass Flow Excavation (MFE) for the joint, that the proposed variation request would not

have a significantly greater impact on the Annex I features of the SAC, from those previously considered in the Appropriate Assessment; even with the increased footprint. We noted concerns with the use of MFE leaving grooves that do not uniformly recover and required further info on number of passes etc.

A10 UXO Clearance

UXO investigation and clearance may be required within the cable corridor to ensure safety during construction operations. As the detailed information regarding number of targets and size is only collected prior to construction, it can be difficult for a full assessment to be undertaken during consenting. This can be problematic as UXO clearance is a noisy activity and assessments need to be undertaken of impacts on marine mammals both alone and in-combination with other activities such as piling. In some cases the actual number of UXO found post-consent is far greater than the predicted number originally assessed.

Example:
At one windfarm, the predictions and assessment had to be revisited several times with much higher numbers of targets involving further Appropriate Assessments, delays and frustration to all parties.

A 11 Boulder Clearance

This takes place where there is a need to remove boulders (typically greater than 300mm in any direction) from the cable installation route in order to enable safe and effective passing of the installation tools and thus achieve sufficient burial of the cables. Boulder clearance can lead to additional disturbance to sensitive habitats and therefore should be fully assessed as part of the application to enable all the impacts to be considered. Natural England's preference is that where necessary boulders should be moved to the side, rather than relocated to a new area, in order to keep the seabed habitat as similar as possible to unimpacted conditions. There are two main methods of boulder clearance – using a grab or plough – of these the use of a grab has much less of an impact on the seabed and should be used as the method of choice, particularly in sensitive habitats. Use of the plough can create a 25cm berm on either side of the plough. Where there are sensitive habitats, or indeed the boulders are part of a feature of an MPA, further consideration needs to be carefully given to the impacts of boulder relocation. As with a number of the other activities associated with cable installation, a lack of full information to allow a realistic assessment during consenting can lead to greater difficulties finding workable solutions later on.

A12 Monitoring and recovery

Where monitoring data is available for a similar level of impact in a similar habitat this is very useful in informing an assessment, particularly in relation to extent of impact and timescales for recovery. As these are both key issues that inform the level of impact on an MPA, and uncertainty around them is often part of the problem, there is a need to continue to collect targeted monitoring data on impacts and recovery in different environments.

Example:
At a windfarm site the cable route was found to go through areas of non-designated cobble reefs and micrositing was agreed around some distinct elevated cobble ridges to avoid the

worst impacts to the reef. It was necessary to go through some less good areas of potential reef and a comprehensive monitoring program was instated to look at the impact and any recovery along these areas of the cable route. In the monitoring report it is possible to clearly see the edges of the cable corridor (10-20m wide) on the multibeam, therefore it is possible to confidently ascribe 'impacted' to 'non impacted' habitat in the Drop Down Video. Assessment of the monitoring data indicated that the areas that were trenched are not expected to recover to the former habitat as it is now flat and it is possible to see patches of exposed clay in some spots. This clearly demonstrated that recovery will not take place in this kind of habitat and therefore micro siting is an important mitigation tool in such areas. What remains interesting is to what extent there will be colonisation of what currently looks a very sparse and damaged seabed, with little living there. The resulting uniformity of the seabed is leading to colonisation of communities with similar characteristics rather than the diversity that previously existed. There are patches of disturbed cobble and stone, which may be recolonized by similar species, however the exposed clay is likely to be colonised by something very different. We are interested in how this damaged habitat evolves and what it turns into physically and in terms of its biology.

A13 Saltmarsh impacts

These are the subject of another paper

A14 Cable repairs

Export and inter-array cables repairs have been necessary at a number of operational windfarms with a wide variety of impacts occurring. These can be particularly problematic where the initial works were close to causing an adverse effect or hindering the conservation objectives of an MPA and therefore any additional works are close to or may cause unacceptable impacts. At least two windfarms have found it necessary to consider fully replace their export cables. One of the key impacts that should be taken into account in assessing cable repairs/ replacement is that of repeated disturbance to the habitat (or species), thus hindering and impeding timescales for recovery or causing additional disturbance to an area that has recovered. Whilst these impacts may be within the footprint of those that occurred during construction they are additional and therefore need to be assessed cumulatively.

At 12 operational windfarms long term maintenance marine licenses have been granted for emergency cable repairs. This enables a certain number of cable repairs to be carried out using the specified methodology within the remaining lifetime of the project (usually 10-25 years). This demonstrates the operator's opinion that cable repairs are likely and indeed a number of repairs have been carried out under these licenses since they were granted. As part of the long term maintenance license applications, impacts on the marine environment from the proposed number of repairs are fully assessed, with Habitats Regulations or MCZ assessments where required, and conditions applied where necessary for mitigation. All long term maintenance licenses have a 5 yearly review period as a condition enabling a review of what works have taken place under the license and whether there have been any changes that may require modification of the license. Whilst this has been necessary for early developments, those that are going through consenting now should thoroughly assess the impact of cable repairs and replacement, in order for an assessment to be complete and the full impacts of the project to be considered at the time of application. As stated in the

Offshore Wind Programme Board paper '*Contingency plans to cover critical paths in the installation process should be incorporated into the overall execution plan. This includes not only contingency timelines, as mentioned in the previous section, but also operational contingency plans, such as for cable abandonment and cable repair*.'

In a recent marine license application a windfarm has submitted a request to repair 4km of cable immediately after installation. This may increase impacts as where there is disturbed ground they may choose to cut the cable off and install a new section alongside increasing the impact. If immediate repairs are thought to be necessary then their impacts should be assessed as part of the application along with all other impacts of installation, repair and maintenance.

10. Annex 2: Cable protection

Natural England have ongoing concerns around the use of cable protection in the marine environment. We are lacking in data regarding the full extent of cable and scour protection within the marine environment both within and outside marine protected areas and the potential impacts of this on the natural functioning of the environment. In addition there is little coordination of the data on the amount and location or cable and scour protection installed in relation to that consented across all industries. Natural England is concerned about the levels of existing and proposed scour and cable protection because the environmental impacts include;

- Loss of/ modification to habitat through the introduction of different material
- Recoverability of soft sediment communities
- Current and tidal flow disturbance
- Interruption of and changes to sediment (bedload) transport therefore affecting both near-shore geomorphological processes and ecosystem functionality.
- Increase in scour
- Creation of a substrate for marine communities which would not naturally occur in a particular region.
- Facilitation of the spread of species associated with hard substrates around the coastline, particularly non-natives, and in response to climate change.

Within an MPA these concerns are particularly pertinent and require assessment against the conservation objectives for the site. Issues can be compounded where cable protection, that may have a relatively small footprint, impacts on features that are already under pressure due to other activities such as foundation installation, aggregate extraction and fishing. In soft sediment environments there are particular concerns around changes to natural functioning of the habitat – in harder substrates there may be more opportunity to design scour protection which functions similarly to the natural environment.

Due to a lack of sufficient information regarding rock amouring from oil and gas decommissioning in North Norfolk Sandbanks and Saturn Reef SAC, Pidduck *et al* 2017 concludes that it is not possible to quantify or qualify the movement of sandbanks around or over existing or applied rock amouring. Theoretically, the mobile sandbanks may cyclically cover applied rock armouring and there is the potential for scour to be induced if an appropriate design is not chosen. Without further information on rock berm design, monitoring studies and numerical modelling of such behaviour, the short-term and long-term implications of both theoretical behaviours are difficult to determine. The report also concludes that the effects of decommissioning methods of oil and gas infrastructure have the potential to delay or even hamper the achievement of the conservation objectives of protected features designated under the Habitats Directive (92/43/EEC) and the integrity of the designated site.

Due to the above concerns, Natural England recommends that cable protection is kept to a minimum, that any use is fully justified and that where possible consideration is given to techniques that minimise the environmental impact including the use of material similar in size and composition to the natural material (e.g. in stony reef areas) and the use of material that is removable on decommissioning. However cable protection usually defaults to rock protection (almost always granite quarried in Norway) or concrete mattressing. There

remains a lack of evidence around the removability of these methods on decommissioning with different answers from different developers. Repair work on the export cable at one offshore windfarm found that the rock protecting the cable was not removable and a new section of cable had to be spliced in around the rock protected section. With concrete mattressing developers often cite degradation in the ropes and links holding the mattresses together as a potential health and safety issue and barrier to removal on decommissioning. Anecdotal evidence from developers has highlighted that mattresses are easily moved or flipped by anchors. These structures have not been designed to be removed and are expected to pose some challenges in general with area specific differences as described by Jee Ltd., Zero Waste Scotland and Decom North Sea (2016).

Additionally every effort should be made to realistically assess the need for cable protection as part of the application in order for issues to be fully considered and mitigated where necessary at consenting stage. This is also of benefit to the developer as highlighted in the Offshore Wind Programme Board Paper *'Remedial works may be needed where cable protection levels are deemed insufficient. For example, for rock placement or mattress installation work, additional permits and licenses may be required, which will take time to obtain.*' The assessment, particularly in an MPA, should use (and gather where necessary) detailed information on the substrate along the cable route to inform likely areas of insufficient burial and need for cable protection. Cable protection should then be selected that works best with and minimises impacts on the particular substrate and there should then be an assessment of the impacts of the cable protection on each habitat type/ feature. Generic assessments and licensing of total amounts of cable protection across the entire cable routes have proved unhelpful in the past and led to the need for further assessment post consent, particularly where proposals are within an MPA. Additionally in a large number of cases additional cable protection has been required post consent due to cable burial issues discussed above. Lessons should also be learnt from earlier cable installation in planning and assessing cable routes. For example experience at an offshore windfarm and nearby interconnector cable has shown that sufficient cable burial is rarely achieved in chalk. At the windfarm there was a need to install over 200km of post construction cable protection due to insufficient burial depths. The interconnector cable project has also applied for post installation cable protection that was not considered at the time of application. Subsequent to the initial draft of this document a further interconnector cable and windfarm have applied for cable protection within MPAs that was not assessed at the time of application – in both these cases the operator agreed to no cable protection in the MPA at the time of consenting and has come back with license variations to place cable protection in the MPAs, effectively rendering the original assessment and consent incomplete.

As discussed under mitigation and scour elsewhere in the document, where cable protection is needed it is also important to pay attention to the sand wave field in the area surrounding the rock armouring location. The rippling in the sand in the wider area can show how mobile is the area and the sediment transport direction. Where possible the cable protection in a dynamic environment should not be placed perpendicular to the sediment transport (i.e. the long side of the rock protection should not run at angles close to parallel with the ripple crests) as this can result is large scour pits. If this is considered necessary then the associated issues highlighted should be considered and addressed as part of the application.

11. References:

Jee Ltd., Zero Waste Scotland and Decom North Sea, 2016. Mattress Solutions

Pidduck, E., Jones, R., Daglish, P., Farley, A., Morley, N., Page, A. & Soubies, H., (2017), Identifying the possible impacts of rock dump from oil and gas decommissioning on Annex I mobile sandbanks, JNCC Report 603, ISSN 0963-8901

NATURAL ENGLAND

From: Leighton Matthew [redacted]
Sent: 13 November 2018 15:04
To: Hornsea Project Four
Subject: Ref EN010098-000019 - Scoping consultation, Hornsea Project Four Offshore Wind Farm

FAO – Gail Boyle
Ref – EN010098-000019
Proposal – Scoping Consultation
Location – Hornsea Project Four Offshore Wind Farm

Thank you for your letter of 16 October 2018 providing Network Rail with an opportunity to comment on the abovementioned scoping consultation.

With reference to the protection of the railway, the Environmental Impact Assessment should include a construction traffic management plan the considers the impact of traffic and in particular abnormal loads, on railway assets including railway level crossings and bridges in the vicinity of the proposed work sites. If construction site traffic is to be routed via Network Rail assets such as level crossings and railway bridges (which may have limited clearance or weight restrictions) agreement must be sought with Network Rail in advance of work commencing.

The EIA must also consider the timing and impact of the scheme (in particular any works crossing under and adjacent to Network Rail land) on the operational railway infrastructure.

We would also remind the developer that any works that cross the railway or use Network Rail property will require the necessary licensing/agreements to be entered into with our Easements and Wayleaves Team and also agreement of the scheme and construction methodology with our Asset Protection Team to ensure that there is no impact on operational railway safety during construction and subsequent site operations.

I hope that the above is useful to you. If you require any further information, please let me know.

Kind regards,

Matt Leighton
Town Planning Technician | Property
Network Rail
George Stephenson House | Toft Green |York |YO1 6JT
[redacted]
www.networkrail.co.uk/property

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From: GROWNS, Andy (NHS EAST RIDING OF YORKSHIRE CCG) [redacted]
Sent: 23 October 2018 12:04
To: Hornsea Project Four
Subject: Your Ref: EN010098-000019

Message to Gail Boyle, Senior EIA and Land Rights Advisor on behalf of the Secretary of State

With regard to your letter to NHS East Riding of Yorkshire CCG dated 16th October Ref. EN010098-000019, I can confirm that following discussions with the CCG's Senior Leadership Team, we have no comments to offer.

Kind Regards

Andy Growns
Head of Corporate Governance & Organisational Development
East Riding of Yorkshire Clinical Commissioning Group
Health House
Grange Park Lane
Willerby
HU10 6DT

[redacted]

@EastridingCCG

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East Riding of Yorkshire
Clinical Commissioning Group

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The Coal Authority
Resolving the impacts of mining

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www.gov.uk/coalauthority

For the attention of: Gail Boyle
Senior EIA and Land Rights Advisor
on behalf of the Secretary of State

[Email to: HornseaProjectFour@pins.gsi.gov.uk]

Application Reference: EN010098-000019

07 November 2018

Dear Ms Boyle

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11

Application by Orsted (the Applicant) for an Order granting Development Consent for the Hornsea Project Four Offshore Wind Farm (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Thank you for your notification of 16 October 2018 seeking the views of the Coal Authority on the above.

I have reviewed the site location plan (Figure 1.1 within the Environmental Impact Assessment: Scoping Report) against the information held by the Coal Authority and can confirm that the proposed development site is located outside of the defined coalfield. Accordingly, the Coal Authority has no issues that it would wish to see considered as part of the Scoping Opinion.

Yours sincerely

D Roberts

Deb Roberts *M.Sc.MRTPI*
Planning Liaison Officer

From: Stephen Vanstone [redacted]
Sent: 12 November 2018 14:04
To: Hornsea Project Four
Cc: Trevor Harris
Subject: RE: EN010098 - Hornsea Project Four Offshore Wind Farm - EIA Scoping Notification and Consultation

Good afternoon Gail,

Trinity House would expect the following to form part of the Environmental Statement:

Navigation Risk Assessment

- Comprehensive vessel traffic analysis in accordance with MGN 543.

- The possible cumulative and in-combination effects on shipping routes and patterns should be fully assessed, with particular reference to the Hornsea One and Hornsea Two offshore wind farms.

- Any proposed layouts should conform with MGN 543 and again consideration should be given to the layouts of Hornsea One and Two OWFs.

- If any structures, such as met masts, offshore platforms, accommodation platforms or other transmission assets, lie outwith the actual wind farm turbine layout, then additional risk assessment should be undertaken.

Risk Mitigation Measures

- We consider that this development will need to be marked with marine aids to navigation by the developer/operator in accordance with the general principles outlined in IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities) Recommendation O-139 on the Marking of Man-Made Offshore Structures as a risk mitigation measure. In addition to the marking of the structures themselves, it should be borne in mind that additional aids to navigation such as buoys may be necessary to mitigate the risk posed to the mariner, particularly during the construction phase. All marine navigational marking, which will be required to be provided and thereafter maintained by the developer, will need to be addressed and agreed with Trinity House. This will include the necessity for the aids to navigation to meet the internationally recognised standards of availability and the reporting thereof.

- Any monitoring equipment, including met masts and LIDAR or wave buoys must also be marked as required by Trinity House.

- A decommissioning plan, which includes a scenario where on decommissioning and on completion of removal operations an obstruction is left on site (attributable to the wind farm) which is considered to be a danger to navigation and which it has not proved possible to remove, should be considered. Such an obstruction may require to be marked until such time as it is either removed or no longer considered a danger to navigation, the continuing cost of which would need to be met by the developer/operator.

- The possible requirement for navigational marking of the export cables and the vessels laying them. If it is necessary for the cables to be protected by rock armour, concrete mattresses or similar protection which lies clear of the surrounding seabed, the impact on navigation and the requirement for appropriate risk mitigation measures needs to be assessed.

Kind regards,

Steve Vanstone
Navigation Services Officer
Trinity House