

**The Great Grid Upgrade**

Sea Link

# Preliminary Environmental Information Report

Volume: 1

Part 4 Offshore Scheme

Chapter 7 Marine Archaeology

Version A

October 2023

**nationalgrid**

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## Document control

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## 4.7 Marine Archaeology

### 4.7.1 Introduction

- 4.7.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents information about the preliminary environmental assessment of the likely significant marine archaeology effects identified to date, that could result from the Proposed Project (as described in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**).
- 4.7.1.2 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, mitigation measures and the preliminary marine archaeology residual significant effects that could result from the Proposed Project.
- 4.7.1.3 The draft Order Limits, which illustrate the boundary of the Proposed Project, are illustrated on **Figure 1.1.1 Draft Order Limits** and the Offshore Scheme Boundary is illustrated on **Figure 1.1.4 Offshore Scheme Boundary**.
- 4.7.1.4 This chapter should be read in conjunction with:
- **Volume 1, Part 1, Chapter 4, Description of the Proposed Project;**
  - **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology;**
  - **Volume 1, Part 1, Chapter 6, Scoping Opinion and EIA Consultation;**
  - **Volume 1, Part 2, Chapter 4, Cultural Heritage;**
  - **Volume 1, Part 3, Chapter 4, Cultural Heritage;**
  - **Volume 1, Part 4, Chapter 1, Evolution of the Offshore Scheme;** and
  - **Volume 1, Part 4, Chapter 2, Physical Environment.**
- 4.7.1.5 This chapter is supported by the following figures:
- **Volume 3, Figure 4.7.1 Marine Archaeological study area;**
  - **Volume 3, Figure 4.7.2 Palaeogeographic receptors of archaeological potential and geoarchaeological priority of vibrocores;**
  - **Volume 3, Figure 4.7.3 Seabed receptors of archaeological potential;** and
  - **Volume 3, Figure 4.7.4 Intertidal receptors of archaeological potential.**
- 4.7.1.6 This chapter is supported by the following appendices:
- **Volume 2, Appendix 1.4.A Outline Code of Construction Practice;**
  - **Volume 2, Appendix 1.4.F Outline Schedule of Environmental Commitments and Mitigation Measures;**
  - **Volume 2, Appendix 4.7.A Marine Archaeological Technical Report;** and
  - **Volume 2, Appendix 4.7.B, Written Scheme of Investigation.**

## 4.7.2 Regulatory and Planning Context

- 4.7.2.1 This section sets out the legislation and planning policy that is relevant to the preliminary marine archaeology assessment. A full review of compliance with relevant national and local planning policy will be provided within the Planning Statement that will be submitted as part of the application for Development Consent.
- 4.7.2.2 Policy generally seeks to minimise effects from development and to avoid significant adverse effects to marine archaeology receptors. This applies particularly to palaeogeography; seabed features including maritime and aviation sites; intertidal heritage assets; and the historic seascape character of the region.

### Legislation

#### **Marine and Coastal Access Act 2009**

- 4.7.2.3 The Marine and Coastal Access Act 2009 (Ref 7.1) provides the legal mechanism to help ensure clean, healthy, safe and productive and biologically diverse oceans and seas and is the primary legislation relevant to the marine planning system. In England, marine licensing and marine planning is the responsibility of the Marine Management Organisation (MMO) as advised by Historic England with regards the cultural environment.

#### **Protection of Wrecks Act 1973, Section One and Two**

- 4.7.2.4 Section One of the Act (Ref 7.2) designates a restricted area around a wreck to prevent uncontrolled interference. These protected areas are likely to contain the remains of a vessel, or its contents, which are designated due to their historical, archaeological, or artistic value. Section Two provides for designation of dangerous sites. Wreck sites must have a known location in order to be designated.

#### **Ancient Monuments and Archaeological Areas Act 1979 (as amended)**

- 4.7.2.5 The Ancient Monuments and Archaeological Areas Act 1979 (as amended) (Ref 7.3) protects terrestrial and marine archaeological heritage of England, Wales and Scotland. Any site can be scheduled that appears to be of national importance because of its historic, architectural, traditional, artistic or archaeological interest.

#### **Protection of Military remains Act 1986**

- 4.7.2.6 The Protection of Military remains Act 1986 (Ref 7.4) provides protection for the wreckage of military aircraft and designated military vessels. The Act provides two types of protection: Protected Places (wrecks designated by name and can be designated even if the location of the site is not known) and Controlled Sites (sites designated by location). It is illegal to disturb these sites. All aircraft lost while in military service are automatically protected under the Act.

#### **Merchant Shipping Act 1995**

- 4.7.2.7 Part IX: Salvage and Wreck of the Merchant Shipping Act 1995 (Ref 7.5) sets out the procedures for determining the ownership of underwater material identified as 'wreck', defined as flotsam, jetsam, derelict and lagan found in or on the shores of the UK's territorial waters or any UK tidal water. Ownership of any wreck remains is determined

in accordance with the Act as administered by the Receiver of Wreck of the Maritime Coastguard Agency.

## National Policy

### National Policy Statements

4.7.2.8 National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Proposed Project would be considered. A review of the NPS was announced in the 2020 Energy white paper: Powering our net zero future. This review was to ensure the NPSs were brought up to date to reflect the policies set out in the white paper. The below information reflects these updates currently under consultation. Table 4.7.1, Table 4.7.3 and Table 4.7.3 below provide details of the elements of NPS (EN-1) (Overarching National Policy Statement for Energy (Ref 7.6), NPS for Renewable Energy Infrastructure (EN-3) (Ref 7.7) and NPS for Electricity Networks Infrastructure (EN-5) (Ref 7.8) that are relevant to this chapter, and how and where they are covered in the PEIR or will be covered within the Environmental Statement (ES).

Table 4.7.1: NPS EN-1 requirements relevant to marine archaeology (Update for consultation 2023).

NPS EN-1 section	Where this is covered in the PEIR
<p>5.9.10 “...As part of the ES the applicant should provide a description of the significance of the heritage assets affected by the proposed development, including any contribution made by their setting. The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the applicant should have consulted the relevant Historic Environment Record (or, where the development is in English or Welsh waters, Historic England or Cadw) and assessed the heritage assets themselves using expertise where necessary according to the proposed development’s impact.”</p>	<p>The significance of marine heritage receptors has been discussed in the Baseline Conditions section (4.7.6). Data has been obtained from several sources (within section 4.7.4) including the National Marine Heritage Record (NMHR) and Historic Environment Records (HERs) for Suffolk and Kent.</p>
<p>5.9.11 “...Where a site on which development is proposed includes, or the available evidence suggests it has the potential to include, heritage assets with an archaeological interest, the applicant should carry out appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation. Where proposed development will affect the setting of a heritage</p>	<p>A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests (<b>Appendix 4.7.A Marine Archaeological Technical Report</b>) and is summarised in section 4.7.4. The setting of the archaeological resource has also been assessed, although due to their marine nature,</p>

NPS EN-1 section	Where this is covered in the PEIR
<i>asset, representative visualisations may be necessary to explain the impact.”</i>	representative visualisations have not been generated.
5.9.12 (part) <i>“...The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage assets affected can be adequately understood from the application and supporting documents.”</i>	The significance of the marine heritage resource is included in the Baseline Conditions section (4.7.6) and the likely significance of such an impact is presented in Table 4.7.19.
5.9.25 <i>“...When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset’s conservation. The more important the asset, the greater the weight should be. This is irrespective of whether any potential harm amounts to substantial harm, total loss, or less than substantial harm to its significance.”</i>	There are no designated archaeological sites in the study area at present. Non-designated sites are not necessarily of lesser value and therefore, non-designated assets that can be demonstrated to be of equivalent value to designated sites are considered to be of equivalent significance to a designated asset for the purpose of this assessment. All sites considered to be of archaeological importance (or are modern wreck sites considered to be seabed hazards) have an Archaeological Exclusion Zone (AEZ) implemented around them preventing any works to be undertaken within the extent. Table 4.7.18 lists all the receptors with AEZs and their recommended buffer size.
5.9.26 <i>“...The Secretary of State should give considerable importance and weight to the desirability of preserving all heritage assets. Any harm or loss of significance of a designated heritage asset (from its alteration or destruction, or from development within its setting) should require clear and convincing justification.”</i>	As above
5.9.17 <i>“...Where the loss of the whole or part of a heritage asset’s significance is justified, the Secretary of State will require the applicant to record and advance understanding of the significance of the heritage asset before it is lost (wholly or in part). The extent of the requirement should be proportionate to the asset’s importance and significance and the impact. The</i>	The significance of the marine heritage resource is included in the Baseline Conditions section (4.7.7). Best practice favours preservation <i>in situ</i> of archaeological remains, and therefore the ideal mitigation is avoidance. Avoidance of any



NPS EN-1 section	Where this is covered in the PEIR
<p><i>applicant should be required to publish this evidence and to deposit copies of the reports with the relevant Historic Environmental Record. They should also be required to deposit the archive generated in a local museum or other public repository willing to receive it..”</i></p>	<p>known seabed features is recommended, not only due to their historic importance but also as operational hazards. Other mitigation measures are presented in section 4.7.8. The WSI (<b>Appendix 4.7.B Written Scheme of Investigation</b>) provides further details of archive deposition for project related data and associated reports.</p>
<p>5.9.18 “...Where appropriate, the Secretary of State will impose requirements on the Development Consent Order to ensure that the work is undertaken in a timely manner, in accordance with a written scheme of investigation that complies with the policy in this NPS and which has been agreed in writing with the relevant local authority, and to ensure that the completion of the exercise is properly secured.”</p>	<p>The WSI (<b>Volume 2, Appendix 4.7.B, Written Scheme of Investigation</b>) recommends timescales required for work to be undertaken, associated reporting to be submitted, and archives to be deposited. The WSI will be approved by Historic England (formerly English Heritage) prior to its implementation.</p>

Table 4.7.2: NPS EN-3 requirements relevant to marine archaeology (Update for consultation 2023).

NPS EN-3 section	Where this is covered in the PEIR
<p>3.8.182 “...The marine historic environment can be affected by offshore wind farm development in two principal ways: from direct effects arising from of the physical siting of the development itself such as the installation of wind turbine foundations and electricity cables or the siting of plant required during the construction phase of development; and from indirect changes to the physical marine environment (such as scour, coastal erosion or sediment deposition) caused by the proposed infrastructure itself or its construction.”</p>	<p>Direct and indirect impacts to the marine heritage will be fully addressed in the WSI (<b>Volume 2, Appendix 4.7.B, Written Scheme of Investigation</b>).</p>
<p>3.8.183 “...Applicants should consult with the relevant statutory consultees, such as Historic England or Cadw, on the potential impacts on the marine historic environment at an early stage of development during preapplication, taking into account any applicable guidance (e.g., offshore</p>	<p>Historic England are a key stakeholder for the Proposed Project and will be consulted throughout the process (refer to section 4.7.3).</p>

NPS EN-3 section	Where this is covered in the PEIR
<i>renewables protocol for archaeological discoveries).</i> ”	The offshore protocol for archaeological discoveries is no longer active.
3.8.184 “...Assessment of potential impacts upon the historic environment should be considered as part of the Environmental Impact Assessment process undertaken to inform any application for consent.”	Potential impacts are assessed in section 4.7.9 of the PEIR chapter and also within the WSI ( <b>Volume 2, Appendix 4.7.B, Written Scheme of Investigation</b> ).
3.8.185-186 “...Desk based studies to characterise the features of the historic environment that may be affected by a proposed development and assess any likely significant effects should be undertaken by competent archaeological experts. These studies should consider any geotechnical or geophysical surveys that have been undertaken to aid the wind farm design.”	A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests within the study area ( <b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report</b> ) and is summarised in section 4.7.4. This document includes the archaeological assessment of both geophysical and geotechnical survey data.
3.8.187-189 “...Whilst it might be possible for a development project to avoid designated heritage assets, the knowledge currently available about the historic environment in the inshore and offshore areas is limited. Applicants are required to determine how any known heritage assets might best be avoided. The applicant will be expected to conduct all necessary examination and assessment exercises using a variety of survey techniques to plan the development so as to optimise opportunities for avoidance.”	A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests within the study area ( <b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report</b> ) and is summarised in section 4.7.4. This document includes the archaeological assessment of both geophysical and geotechnical survey data. Mitigation measures including avoidance are presented in section 4.7.8.
3.8.191 “...Assessment may also include the identification of any beneficial effects on the marine historic environment, for example through improved access or the contribution to new knowledge that arises from investigation.”	Beneficial effects are also taken into account and are included in Table 4.7.19 where applicable.
3.8.270-272 “...The avoidance of important heritage assets to ensure their protection in situ, is	Mitigation measures including avoidance and

NPS EN-3 section	Where this is covered in the PEIR
<p><i>the most effective form of protection. This can be achieved through the implementation of exclusion zones around known and potential heritage assets which preclude development activities within their boundaries. These boundaries can be drawn around either discrete sites or more extensive areas identified in the Environmental Statement produced to support an application for consent.”</i></p>	<p>AEZs are presented in section 4.7.8. All sites considered to be of archaeological importance (or are modern wreck sites considered to be seabed hazards) have an AEZ preventing any works to be undertaken within the extent. Table 4.7.18 lists all the receptors with AEZs and their recommended buffer size.</p>
<p>3.8.273 “...The ability of the applicants to microsite specific elements of the proposed development during the construction phase should be an important consideration by the Secretary of State when assessing the risk of damage to archaeology.”</p>	<p>Micro-siting is a mitigation measure (MA06) presented in section 4.7.8.</p>

Table 4.7.3: NPS EN-5 requirements relevant to marine archaeology (Update for consultation 2023).

NPS EN-5 section	Where this is covered in the PEIR
<p>2.2.10-11 “... As well as having duties under Section 9 of the Electricity Act 1989, (in relation to developing and maintaining an economical and efficient network), applicants must take into account Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to “have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and ... do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.” Depending on the location of the proposed development, statutory duties under Section 85 of the Countryside and Rights of Way Act 2000 and Section 11A of the National Parks and Access to the Countryside Act 1949 (as amended by Section 62 of the 1995</p>	<p>A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests within the study area (<b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report</b>) and is summarised in section 4.7.4.</p> <p>The significance of the marine heritage resource is included in the Baseline Conditions section (4.7.6). The recommended mitigation to protect the marine archaeological resource is presented in section 4.7.8.</p>

NPS EN-5 section	Where this is covered in the PEIR
<p><i>Environment Act), and Section 17A of the Norfolk and Suffolk Broads Act 1988 may be relevant”.</i></p>	
<p>2.13.15 “...<i>The sensitivities of many coastal locations and of the marine environment as well as the potential environmental, community and other impacts in neighbouring onshore areas must be considered in the identification onshore connection points”.</i></p>	<p>A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests within the intertidal area of the study area (<b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report</b>) and is summarised in section 4.7.4. The significance of the intertidal marine heritage assets has been discussed in the Baseline Conditions section (4.7.7) of this chapter. The recommended mitigation to protect the marine archaeological resource is presented in section 4.7.8.</p>

### National Planning Policy Framework

- 4.7.2.9 The National Planning Policy Framework (NPPF; Ref 7.9) has the potential to be considered important and relevant to the Secretary of State (SoS) consideration of the Proposed Project. Table 4.7.4 below provides details of the elements of the NPPF that are relevant to this chapter, and how and where they are covered in the PEIR or will be covered within the ES.

Table 4.7.4: NPPF requirements relevant to marine archaeology.

NPPF section	Where this is covered in the PEIR
<p>Paragraph 178 “<i>Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 176), 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.”</i></p>	<p>A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests within the intertidal area of the study area (<b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report.</b>) and is summarised in section 4.7.4. The significance of the intertidal marine heritage</p>

NPPF section	Where this is covered in the PEIR
<p>Paragraph 190 “Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. This strategy should take into account: [inter alia] ... the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation; ... [and] the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring; ... [and] the desirability of new development making a positive contribution to local character and distinctiveness; ...[and] opportunities to draw on the contribution made by the historic environment to the character of a place”.</p>	<p>assets has been discussed in the Baseline Conditions section (4.7.6) of this chapter. The recommended mitigation to protect the marine archaeological resource is presented in section 4.7.8.</p> <p>The significance of the intertidal marine heritage assets has been discussed in the Baseline Conditions section (4.7.7) of this chapter. The recommended mitigation to protect the marine archaeological resource is presented in section 4.7.8.</p>
<p>Paragraph 194 “In determining applications, local planning authorities should require an applicant 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 no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.”</p>	<p>A desk-based assessment has been undertaken to assess the archaeological interest of marine heritage interests within the study area (<b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report.</b>) and is summarised in section 4.7.4. Data has been obtained from several sources (within section 4.7.4) including the NMHR and HERs for Suffolk and Kent. The significance of marine heritage assets has been discussed in the Baseline Conditions section (4.7.7) of this chapter. The recommended mitigation to protect the marine archaeological resource is presented in section 4.7.8.</p>

NPPF section	Where this is covered in the PEIR
	A walkover survey of the intertidal area of the study area landfalls is planned for Summer 2023 and the results will inform the ES.

### National Planning Practice Guidance

- 4.7.2.10 The NPPF sets out the government’s planning policies for England and how these are expected to be applied. The Planning Practice Guidance provides information relating to the NPPF and other relevant planning practice guidance (Ref 7.10). Guidance relating specifically to the Historic Environment has been utilised for the purposes of this chapter (Ref 7.11).

### National Marine Policy

- 4.7.2.11 The UK Marine Policy Statement (MPS; Ref 7.12) was adopted in 2011 and provides the policy framework for the preparation of marine plans and establishes how decisions affecting the marine area should be made. Marine licensing and marine planning are the responsibility of the MMO, as advised by Historic England.
- 4.7.2.12 Under the Marine and Coastal Access Act 2009 (Ref 7.1), marine plans must be consistent with the UK MPS (Ref 7.12) and fully reflect the requirements of the MPS at a local level. Marine Plans (see below) set out how the MPS will be implemented in specific areas.

## Marine Planning Policy

The following marine plans have been considered relevant to the study of marine archaeology and have informed the assessment of preliminary effects in this chapter as follows:

- East Inshore and East Offshore Marine Plan (Ref 7.13); and
- South East Inshore Marine Plan (Ref 7.14).

Table 4.7.5: Marine Planning Policies relevant to marine archaeology.

Marine Plan	Where this is covered in the PEIR
East Inshore and East Offshore Marine Plan	Details relevant to this assessment are provided in <b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report.</b>
South East Inshore Marine Plan	Details relevant to this assessment are provided in <b>Appendix 4.7.A Marine Archaeological Technical Report.</b>

## Local Planning Policy

- 4.7.2.13 The intertidal area of the Offshore Scheme lies within the jurisdiction of Suffolk County Council, East Suffolk Council, Suffolk Coastal Local Plan, Kent County Council and within the boundary of Thanet District Council Local Plan and Dover District Local Plan.
- 4.7.2.14 Local Plan policies which are relevant to marine archaeology and will inform the assessment in the ES are detailed in Table 4.7.6.

Table 4.7.6: Local Planning Policies relevant to marine archaeology.

<b>Suffolk and Kent Coastal Local Plans – Where this is covered in the PEIR Policy</b>	
Suffolk Coastal Local Plan Adopted 2020 (Ref 7.15)	Details relevant to this assessment are provided in <b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report.</b>
Local Plan Adopted July 2020 (Ref 7.16)	Details relevant to this assessment are provided in <b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report.</b>

- 4.7.2.15 Additional guidance documents relevant to marine archaeology matters are as follows:
- Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers (Ref 7.17);
  - Managing Lithic Scatters: Archaeological Guidance for Planning Authorities and Developers (Ref 7.18);
  - Military Aircraft Crash Sites: Archaeological guidance on their significance and future management (Ref 7.19);
  - Wind Energy and the Historic Environment (Ref 7.20);
  - The Code of Practice for Seabed Developers (Ref 7. 21);
  - Historic Environment Guidance for the Offshore Renewable Energy Sector (Ref 7.22)
  - Conservation Principles, Policies and Guidance for the sustainable management of the historic environment (Ref 7.23);
  - Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (Ref 7.24);
  - Our Seas – A shared resource: High level marine objectives (Ref 7.25);
  - Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (second edition) (Ref 7.26);
  - Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Ref 7.27);
  - Ships and Boats: Prehistory to Present - Designation Selection Guide (Ref 7.28);

- Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (Ref 7.29);
- Cumulative Impact Assessment Guidelines – Guiding Principles for Cumulative Impacts Assessment in Offshore Wind Farms (Ref 7.30);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Ref 7.31);
- Managing Significance in Decision-Taking in the Historic Environment Historic Environment Good Practice Advice in Planning: 2 (Ref 7.32);
- Preserving Archaeological Remains: Decision-taking for Sites under Development (Ref 7.33);
- The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning: 3 (Second Edition) (Ref 7.34);
- Conservation Principles for the Sustainable Management of the Historic Environment (Ref 7.35);
- Statements of Heritage Significance: Analysing Significance in Heritage Assets: Historic England Advice Note 12 (Ref 7.36);
- Deposit Modelling and Archaeology Guidance for Mapping Buried Deposits (Ref 7.37);
- Standard and Guidance for Archaeological Advice by Historic Environment Services (Ref 7.38);
- Commercial Renewable Energy Development and the Historic Environment: Historic England Advice Note 15 (Ref 7.39);
- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (Ref 7.40);
- Code of Conduct: Professional Ethics in Archaeology (Ref 7.41); and
- Curating the Palaeolithic (Ref 7.42).

### 4.7.3 Scoping Opinion and Consultation

#### Scoping

- 4.7.3.1 A Scoping Report (Ref 7.43) for the Proposed Project was issued to the Planning Inspectorate (PINS) on 24 October 2022 and a Scoping Opinion (Ref 7.44) was received from the SoS on 1 December 2022. Table 4.7.7 sets out the comments raised in the Scoping Opinion and how these have been addressed in this PEIR or will be addressed within the ES. The Scoping Opinion takes account of responses from prescribed consultees as appropriate.

Table 4.7.7: Comments raised in the Scoping Opinion

ID	Inspectorate's comments	Response
5.6.1	No matters have been proposed to be scoped out of the assessment.	All themes relating to marine archaeology will be



ID	Inspectorate's comments	Response
5.6.2	<p>The Scoping Report states that the study area is the offshore scoping boundary as shown on <b>Figure 4.7.1 Marine Archaeological study area</b>. The Inspectorate notes that the extent of the study area will be subject to review and may be extended in future. The ES must provide a clear rationale for the definition of the study area which explains how the study area relates to the Zol of the Proposed Development. The Applicant's attention is drawn to the comments from Historic England in Appendix 2 of this Opinion on the need to ensure that all impacted seabed areas are considered in the assessment, including areas which could be affected by vessel anchoring during construction.</p>	<p>assessed in the PEIR (section 4.7.9 below) and ES assessments with regard to environmental impact.</p> <p>For the purposes of this chapter, the study area is defined as the extent of the Offshore Scheme as defined by the Offshore Scheme Boundary (supplied 28 February 2023).</p>
5.6.3	<p>Historic England and Kent County Council have both identified additional sources of baseline data relevant to the assessment in the ES (see Appendix 2 of this Opinion). In addition, Historic England has also advised that the collection of further cores should be considered. The Applicant is strongly encouraged to seek to agree the baseline data with relevant stakeholders and to provide evidence of that agreement in the ES.</p>	<p>The results of the consolidated HSC (LUC 2018) will be utilised for the PEIR and ES assessments, with regards deriving a perception of historic seascape character of the region.</p> <p>Additional data regarding archaeological features within the intertidal area of the study area has been obtained from CITiZAN and Kent HER.</p> <p>Vibrocores that were assessed as being of high or medium priority following the Stage 1 review will be targeted in a further geotechnical survey to allow for a Stage 2 assessment to be undertaken. This additional survey is planned to take place during Summer 2023</p>

ID	Inspectorate's comments	Response
		and the results will be used to inform the ES. The survey will also include vibrocores from additional areas that were not included in the original geoarchaeological survey.
5.6.4	The Scoping Report states that AEZ will not be proposed for features of lower archaeological value but does not explain how the importance of features would be evaluated; it appears from the text that value and importance are being treated as equivalent, but this is not explicitly stated. The ES must clearly explain the rationale used to determine the importance of archaeological features.	For the purposes of the marine archaeology assessment, value and importance are being treated as equivalent. The methodology for evaluating the importance (or value) of an archaeological asset is further described in <b>Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report</b> and section 4.7.4 below. This methodology will continue through to the ES assessment.
5.6.5	It is noted that the mitigation for the Proposed Development includes a proposed WSI (Written Scheme of Investigation). As this measure may be relied on to avoid significant environmental effects, the Applicant is advised to submit an outline WSI with its application, in order to give confidence to the ExA and SoS regarding the conclusions of significance.	A marine archaeological WSI is appended to this chapter ( <b>Volume 2, Appendix 4.7.B, Written Scheme of Investigation</b> ). The WSI will include archaeological mitigation measures (including offsetting measures) to be utilised throughout the life of the Proposed Project with regards to seabed and sub-seabed anomalies.

## Consultation and Project Engagement

- 4.7.3.2 This section comprises a summary of any consultation with relevant stakeholders in addition to the scoping opinion:
- Vibrocores recovered by MMT and reviewed by Wessex Archaeology as part of the Stage 1 assessment were subsequently targeted and used for engineering lab testing and, as a result, were not usable for the Stage 2 assessment having lost their stratigraphic context and any dating opportunity. A meeting was arranged with Chris Pater, Head of Marine Planning at Historic England, on 4 October 2022 to discuss this and plans to mitigate for the loss of cores. Other attendees

included representatives from National Grid Electricity Transmission plc (National Grid) and Wessex Archaeology. It was agreed that since there is already a good regional understanding of the palaeoenvironment in addition to the Stage 1 review, this is considered enough for the environmental impact assessment necessary for cable burial. For the purposes of the geoarchaeological assessment presented in **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**, the Stage 1 review was supplemented by a series of geoarchaeological deposit models constructed for the study area. Additional geoarchaeological surveys are planned for Summer 2023 and eight duplicate vibrocores will be obtained to allow the Stage 2 assessment to be undertaken. It was agreed that details regarding the missing gaps in palaeoenvironmental information and the plan for further surveys should be detailed in the WSI (**Volume 2, Appendix 4.7.B, Written Scheme of Investigation**). Wessex Archaeology will make recommendations about the additional information, informing National Grid of the scope of additional surveys. The results of further survey work will not be available for inclusion in the PEIR but will be included in the ES.

- If required, regular meetings will be arranged with the marine case officer of Historic England's Marine Planning Unit to provide a project update and discuss progress with regards to the marine archaeology resource. Results of the desk-based assessment will be discussed together with a summary of the proposed impact assessment.

## 4.7.4 Approach and Methodology

4.7.4.1 **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology** sets out the overarching approach which has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the preliminary marine archaeology assessment.

### Guidance specific to the marine archaeology assessment

4.7.4.2 The preliminary marine archaeology assessment has been carried out in accordance with the following good practice guidance documents:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (Ref 7.45);
- Standard and Guidance for Historic Environment Desk-Based Assessment (Ref 7.38);
- Statements of Heritage Significance: Analysing Significance in Heritage Assets: Historic England Advice Note 12 (Ref 7.36);
- Commercial Renewable Energy Development and the Historic Environment: Historic England Advice Note 15 (Ref 7.39); and
- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (Ref 7.40).

4.7.4.3 Guidance relating specifically to subsea cable projects does not currently exist, however since cable routes are an integral part of offshore wind developments, the

guidance above relating to renewable energy and offshore wind farm projects will be utilised for this chapter.

## Baseline Data Gathering and Forecasting Methods

### Sources

4.7.4.4 A number of sources of primary and synthesised information were consulted for the marine archaeological assessment (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**):

- geophysical survey datasets acquired by MMT comprising sub-bottom profiler (SBP), side scan sonar (SSS), magnetometer (Mag.) and Multibeam Echo Sounder (MBES);
- geotechnical data including 65 provisional vibrocore logs provided by MMT;
- the UKHO data for charted wrecks and obstructions (received 4 April 2022);
- the National Marine Heritage Record (NMHR) maintained by Historic England, comprising data for terrestrial and marine archaeological sites, findspots and archaeological events (received 23 March 2022);
- HER records for Suffolk (provided by AECOM's Historic Environment and Cultural Heritage team), Essex (received 17 March 2022) and Kent (received 23 March 2022) comprising databases of their recorded archaeological sites, findspots, and archaeological events;
- the National Heritage List for England maintained by Historic England, comprising data of designated heritage assets including sites protected under the Protection of Military Remains Act 1986 (Ref 7.4) and the Protection of Wrecks Act 1973 (Ref 7.2);
- coastal archaeological findspots and sites from CITiZAN's coastal map (data accessed from CITiZAN website 21 February 2023, Ref 7.46);
- datasets comprising the Historic Seascape Characterisation (HSC): Consolidating the National HSC Database (Ref 7.47);
- relevant background mapping from the area including BGS, Admiralty Charts from the UKHO, historic maps and Ordnance Survey;
- client supplied survey report (Ref 7.48); and
- relevant documentary sources and grey literature held by Wessex Archaeology and those available through the Archaeological Data Service and other websites.

### Desk-based assessment methodology

4.7.4.5 The marine themes relevant to the marine archaeological baseline assessed in this chapter relate to known and potential sites of palaeogeography, seabed features including maritime and aviation sites, intertidal features relating to marine activity, and the historic seascape character in and around the study area.

4.7.4.6 Where possible, data with positional information were incorporated into a project Geographic Information System (GIS) using ArcGIS 10.8.1. The data were

subsequently compiled into gazetteers of the known archaeological features within the study area.

- 4.7.4.7 The palaeogeography assessment comprises a geoarchaeological review of geotechnical data from 65 vibrocores located within the Offshore Scheme Boundary obtained in 2022, along with a review of geological mapping of superficial sediments and solid geology from published British Geological Survey (BGS) sources together with previous assessments undertaken in the study area (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report, Annex 4.7.A.10.3**).
- 4.7.4.8 The assessment of maritime and aviation archaeology was assessed by means of accessing any records of sites, findspots, wrecks, casualties and other seabed features obtained during the geophysical survey together with data from the UKHO, NMHR and local HERs located within the study area (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report, Annex 4.7.A.10.6 and 4.7.A.10.7**). As well as summarising the known archaeological resource, the baseline assessment also underlines the potential for encountering unknown shipwreck and aircraft crash sites within the study area.
- 4.7.4.9 The NMHR and Historic Environment Record (HER) data have been discriminated between records for which there is known material on the seabed, and Recorded Losses that refer to vessels and aircraft that are known to have been lost, but do not, except by chance, have material on the seabed at their recorded loss location (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report, Annex 4.7.A.10.8 and 4.7.A.10.9**). The baseline assessment of maritime and aviation archaeology was further supplemented by a review of relevant primary and secondary source material to provide an indication on the nature of maritime and aviation activity across the region, and subsequent potential for discovering such material.
- 4.7.4.10 The assessment of intertidal heritage assets was assessed from NMHR, Suffolk HER (SHER), Kent HER (KHER) and CITiZAN datasets (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report, Annex 4.7.A.10.10**).
- 4.7.4.11 As noted in the MPS (Ref 7.12), there is no legal definition of ‘seascape’, however, in accordance with the European Landscape Convention, ‘landscape’ can be defined as *“an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”* (Ref 7.49). The term ‘seascape’ can be defined as a subset of ‘landscape’, and has *“an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land and sea, by natural and/or human factors”* (Ref 7.49). The character of the historic seascape was assessed using the compiled results of LUC’s Historic Seascape Characterisation: Consolidating the National HSC Database (Ref 7.47).

### **Geophysical and geotechnical methodologies**

- 4.7.4.12 A summary of the methodology relating specifically to the marine geophysical and geotechnical surveys is presented below and can be found in more detail in the methodology section of the **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**.

#### **Geophysical survey**

- 4.7.4.13 The marine geophysical survey data was acquired between 18 August 2021 and 6 September 2021 by MMT. The nearshore geophysical data were acquired onboard the

*Mersey Discovery* and the offshore geophysical data were acquired onboard MV *Northern Franklin*. Survey data comprised SBP, SSS, Mag. and MBES.

- 4.7.4.14 The geophysical survey is defined as the extents of the SSS dataset, within the wider Offshore Scheme Scoping Boundary. Therefore, the datasets acquired in 2021 do not cover the entire extent of the Offshore Scheme Boundary. Further marine geophysical surveys are planned for Summer 2023 to cover these specific areas; the results of which will be included in the ES.
- 4.7.4.15 Details regarding the processing of geophysical survey data for archaeological assessment can be found in **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**.
- 4.7.4.16 The data were assessed and grouped, and given a unique identifier followed by a discrimination flag to discriminate against those potential features which are not thought to be of an archaeological concern. For anomalies located on the seabed, the flags were ascribed as follows (Table 4.7.8).

Table 4.7.8: Criteria discriminating relevance of identified features

Overview	Discrimination	Criteria	Data type
Archaeological	P1	Feature of probable archaeological interest, either because of its palaeogeography or likelihood for producing palaeoenvironmental material	SBP, MBES
Archaeological	P2	Feature of possible archaeological interest	SBP, MBES
Archaeological	A1	Anthropogenic origin of archaeological interest	MBES, SSS, Mag.
Archaeological	A2_h	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature	MBES, SSS, Mag.
Archaeological	A2_l	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature	MBES, SSS, Mag.
Archaeological	A3	Historic record of possible archaeological interest with no corresponding geophysical anomaly	MBES, SSS, Mag.

- 4.7.4.17 The grouping and discrimination of information at this stage is based on all available information and is not definitive. It allows for all features of potential archaeological interest to be highlighted, while retaining all the information produced during the course

of the geophysical interpretation and desk-based assessment for further evaluation should more information become available.

### Geotechnical survey

- 4.7.4.18 The geotechnical logs and core photographs for 69 vibrocores were provided by MMT for review and geoarchaeological assessment by Wessex Archaeology (65 of which are located within the draft marine Orders Limit). The assessment comprised a Stage 1 investigation, within the five-stage approach developed by Wessex Archaeology (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**). The Stage 1 assessment comprised a desk-based review of the geotechnical and geological data to establish the potential for the presence/absence/distribution of archaeological relevant deposits and to broadly characterise them. This evaluation is used as the basis for deciding whether and what Stage 2 archaeological recording is required.
- 4.7.4.19 The vibrocores were subsequently used for engineering lab testing and, as a result, were not usable for the Stage 2 assessment. Therefore, the geoarchaeological assessment within this chapter will utilise the Stage 1 review supplemented by a series of geoarchaeological deposit models constructed for the study area together with relevant sources that provide a good regional understanding of the palaeoenvironment. This information is considered suitable for the environmental impact assessment necessary for cable burial. Additional geoarchaeological surveys are planned for Summer 2023 and eight duplicate vibrocores will be obtained to allow the Stage 2 assessment to be undertaken. The results of further survey work will be included in the ES.
- 4.7.4.20 The 69 vibrocores from the MMT survey were located within the wider Offshore Scoping Boundary and therefore do not cover the entire extent of the Offshore Scheme Boundary. Further marine geotechnical surveys are planned for Summer 2023 to cover these specific areas; the results of which will be included in the ES.

### Assessment of setting

- 4.7.4.21 The MPS (Ref 7.12) notes that when considering the significance of heritage assets and their setting, *“the particular nature of the interest in the assets and the value they hold for this and future generations”* must be considered, and this *“understanding should be applied to avoid or minimise conflict between conservation of that significance and any proposals for development”*.
- 4.7.4.22 EN-1 states that as part of the ES, *“the applicant should provide a description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance”* (Ref 7.6). In addition, when *“considering applications for development affecting the setting of a designated heritage asset, the IPC should treat favourably applications that preserve those elements of the setting that make a positive contribution to, or better reveal the significance of, the asset”* (Ref 7.6).
- 4.7.4.23 Although the NPPF (Ref 7.9) is designed to be applicable to local planning policy and the historic environment onshore, it provides a definition of setting that also applies to the historic environment. The NPPF (Ref 7.9) defines setting as *“the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.”* Furthermore, the significance of an asset can be

harmed or lost through development occurring within its setting. As heritage assets are irreplaceable, any harm or loss to the setting of an asset needs to be justified.

- 4.7.4.24 Currently, there is no specific guidance regarding the assessment of setting for offshore archaeological and cultural heritage assets. However, Historic England's The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning 3 (Ref 7 34) provides general guidance, largely applicable to terrestrial sites, and notes that the importance of setting "*lies in what it contributes to the significance of the heritage asset*" (Ref 7 34). With regards to significance for heritage policy, NPPF notes that the interest of a heritage asset "*may be archaeological, architectural, artistic or historic*" (Ref 7.9).
- 4.7.4.25 Setting depends on a "*wide range of physical elements within, as well as perceptual and associational attributes pertaining to, the heritage asset's surroundings*" (Ref 7 34). One aspect that contributes to the setting of a heritage asset is referred to as 'views', which includes not only views that can contribute to its significance, but also intended views between heritage assets, and planned views. In addition, the guidance suggests that the appreciation of the setting of a site does not depend on the ability to access it (Ref 7 34). Reference in the guidance is also made to the setting associated with buried heritage assets which may not be readily appreciated by a casual observer, but retains a presence in the landscape such as, for example, wreck sites that are periodically, partly or wholly submerged. In addition, the location and setting of historic battles, with otherwise no visible traces, may include important strategic views, routes by which opposing forces approached each other and a topography that played a part in the outcome (Ref 7 34).
- 4.7.4.26 The assessment of setting in this document follows the guidance discussed in the paragraphs above, is based on the baseline assessment of the palaeogeography, maritime and aviation assets, and is described using the following two factors:
- physical surroundings and views – which includes the physical presence of the asset on the seabed, its surroundings, and relationship with other assets and navigational hazards in the immediate area. Views to and from the asset, and how the asset is experienced in its immediate physical surroundings are also considered; and
  - non-visual factors – including the way the asset is appreciated in a broader historical, artistic and intellectual capacity, and the asset's associations.
- 4.7.4.27 It should be noted that for heritage assets offshore, sites are generally only experienced by divers, remotely operated vehicle (ROV) or by geophysical survey, and the views to the asset are often very limited due to reduced visibility in the water column. In addition, unlike many terrestrial sites, the position of the asset on the seabed has not been deliberately chosen, and although some sites may have reached their position through military action (e.g. hitting a mine within a known minefield or in a battle) or have been lost due to a particular navigational hazard (e.g. being stranded on a particular sandbank), many positions are entirely arbitrary, and even with military sinking events, an attack on the surface could lead to a wreck being deposited on the seabed miles from where the event took place. Non-visual factors may include associations with particular battles, wars, minefields and other historic events, as well as how the wreck can be appreciated in its wider context, for example through well-known trade routes, collisions or local industry. Association between the asset and the local social history is another important aspect of an asset's non-visual importance, including rescue attempts or losses occurring within modern memory.



- 4.7.4.28 It is not possible to ascertain the setting of currently unidentified marine heritage assets, where limited information is known, for example wrecks that have not been identified or characterised to determine their period of build, use or loss. Similarly, setting cannot be assessed for geophysical anomalies of archaeological potential or potential sites that have not yet been discovered.
- 4.7.4.29 The effects a development may have on setting can be assessed by reviewing the development's location and siting, form and appearance, additional effects and permanence (Ref 7 34). The development should be assessed as to whether the development will enhance or harm the significance of the asset: through the principle of development alone; through the scale, prominence, proximity or placement; or through its detailed design (Ref 7 34).
- 4.7.4.30 This assessment indicates whether the setting (i.e. any relationship between deposits/material with their wider environment) of offshore archaeological and cultural heritage assets could be altered, which could lead to an overall diminished value.
- 4.7.4.31 Should the development be assessed as harming the setting of an asset, potential mitigation measures are outlined in the guidance (Ref 7 34).

## Assessment Criteria

### Sensitivity

- 4.7.4.32 The sensitivity of an asset is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. With regards marine archaeology, receptor sensitivity is typically assessed using the following factors:
- adaptability or vulnerability - the degree to which an asset can avoid or adapt to an effect;
  - tolerance - the ability of an asset to accommodate temporary or permanent change without significant adverse impact;
  - recoverability - the temporal scale over and extent to which an asset will recover following an effect; and
  - value - a measure of the asset's importance, rarity and worth.
- 4.7.4.33 The MPS notes that *"heritage assets are a finite and often irreplaceable resource and can be vulnerable to a wide range of human activities and natural processes"* (Ref 7.12). In considering the significance of heritage assets and their setting, the MPS goes on to say *"should take into account the particular nature of the interest in the assets and the value they hold for this and future generations. This understanding should be applied to avoid or minimise conflict between conservation of that significance and any proposals for development"* (Ref 7.12).
- 4.7.4.34 Archaeological and cultural heritage assets cannot adapt, tolerate or recover from physical impacts resulting in material damage or loss caused by proposed development. Consequently, for the purpose of this assessment, the sensitivity of each asset will be quantified by its value. For the purposes of this assessment, value and importance are treated as equivalent terms. Where receptors are considered to be capable of adapting to, tolerating or recovering from indirect impacts, these factors will be incorporated into the assessment of their sensitivity.

- 4.7.4.35 The Overarching National Policy Statement for Energy (EN-1; Ref 7.6) notes that *“there should be a presumption in favour of the conservation of designated heritage assets and the more significant the designated heritage asset, the greater the presumption in favour of its conservation should be.”* However, there are very few designated archaeological sites offshore, and non-designated sites are not necessarily of lesser value. Therefore, non-designated assets that can be demonstrated to be of equivalent value to designated sites are considered to be of equivalent significance to a designated asset for the purpose of this assessment.
- 4.7.4.36 There are a number of criteria for assessing a heritage asset’s importance or value, which are considered in detail in **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**. The following paragraphs provide a summary.
- 4.7.4.37 Historic England's Conservation Principles, Policies and Guidance for the sustainable management of the historic environment (Ref 7.23) uses the following criteria to assess significance: evidential value; historical value; aesthetic value; and communal value. These criteria are still used in Historic England’ draft Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (Ref 7.35).
- 4.7.4.38 Shipwreck sites can specifically be assessed using Historic England’s Ships and Boats: Prehistory to Present - Designation Selection Guide (Ref 7.28) with the following criteria: period; rarity; documentation; group value; survival/condition; and potential. Criteria presented in On the Importance of Shipwrecks (Ref 7.49) also assesses significance based on a vessel’s build, use, loss, survival and investigation. To further supplement this approach, the Aggregate Levy Sustainability Fund funded Marine Class Description and principles of selection for aggregate producing areas project (ALSF 5383), undertaken by Wessex Archaeology (Ref 7.51), proposed a composite timeline that considers wrecks in five distinct date ranges: pre-1500 AD; 1500 - 1815; 1816 - 1913; 1914 - 1945; post 1945. According to this composite timeline, vessels that pre-date 1816 are likely to be considered of special value based on their rarity and subsequent national and international value in our understanding of maritime activity and shipping movements during these periods. Wrecks that post-date 1816 are more plentiful and their value can be assessed based on various themes, such as whether they illustrate a key narrative of the period. The perceived value of each marine archaeological asset is generally assessed and assigned on a case-by-case basis, and in line with research such as Assessing Boats and Ships (Ref 7.52, Ref 7.53 and Ref 7.54) and Early Ships and Boats (Ref 7.55).
- 4.7.4.39 The nature of the archaeological resource is such that there is a high level of uncertainty concerning the distribution of potential, unknown archaeological material on the seabed. It is often the case that data concerning the nature and extent of sites is out of date, extremely limited or entirely lacking. As a precautionary measure, unknown potential cultural heritage receptors are therefore considered to be of high sensitivity and high value, until further information is available to refine this.
- 4.7.4.40 The value of the marine archaeological assets is defined in Table 4.7.9.

**Table 4.7.9: Criteria to assess the archaeological value of heritage assets.**

<b>Value</b>	<b>Definition</b>
Very high	Best known or only example and/or significant potential to contribute to knowledge and understanding and/or public engagement. Assets with a demonstrable international

Value	Definition
	<p>dimension to their importance are likely to fall within this category.</p> <p>Receptors with a demonstrable international dimension to their importance are likely to fall within this category.</p> <p>Wrecked ships and aircraft that are protected under the Protection of Wrecks Act 1973 (Ref 7.2), Ancient Monuments and Archaeological Areas Act 1979 (Ref 7.3) or Protection of Military Remains Act 1986 (Ref 7.4) with an international dimension to their importance, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value.</p> <p>Known submerged prehistoric sites and landscapes with the confirmed presence of largely <i>in situ</i> artefactual material.</p>
High	<p>Above average example and/or high potential to contribute to knowledge and understanding and/or public engagement.</p> <p>Receptors with a demonstrable national level dimension to their importance are likely to fall within this category.</p> <p>All other wrecked ships and aircraft with statutory protection under the Protection of Wrecks Act 1973 (Ref 7.2), Ancient Monuments and Archaeological Areas Act 1979 (Ref 7.3) or Protection of Military Remains Act 1986 (Ref 7.4), plus as-yet undesignated sites that are demonstrably of equivalent archaeological value.</p> <p>Palaeogeographic features with demonstrable potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.</p>
Medium	<p>Average example and/or moderate potential to contribute to knowledge and understanding and/or public engagement.</p> <p>Receptors with a demonstrable district level dimension to their importance are likely to fall within this category.</p> <p>Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation.</p> <p>Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.</p>
Low	<p>Below average example and/or low potential to contribute to knowledge and understanding and/or public engagement.</p> <p>Receptors with a demonstrable local dimension to their importance are likely to fall within this category.</p> <p>Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have low potential</p>

Value	Definition
	based on a formal assessment of their importance in terms of build, use, loss, survival and investigation.  Prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment.
Negligible	Poor example and/or little or no potential to contribute to knowledge and understanding and/or public engagement. Assets with little or no surviving archaeological interest.

4.7.4.41 Determining the overall sensitivity of a receptor is achieved by balancing out the considerations, adaptability or vulnerability, tolerance, recoverability and value, as presented in Table 4.7.10: Sensitivity criteria.

4.7.4.42

Table 4.7.10: Sensitivity criteria.

Sensitivity	General criteria
Very High	Very high importance and rarity, valued at an international level and limited potential for recovery or substitution
High	High importance and rarity, valued at a national level and limited potential for recovery or substitution
Medium	Medium importance and rarity, valued at a regional level, some potential for recovery or substitution
Low	Low or medium importance and rarity, valued at a local level, good potential for recovery or substitution
Negligible	Very low importance and rarity, valued at a local level, easy to replace.

### Magnitude

4.7.4.43 The magnitude of an effect upon known and potential marine archaeological receptors ranges from between large to negligible, and is defined by the following factors:

- scale of change (severity) – the degree of change to or from the baseline environment relative to existing environmental conditions caused by the impact being described;
- spatial extent – the extent of an impact is the full area over which an impact occurs; and
- duration and frequency – a measure of how long the impact is expected to last and how often the impact would occur (it may be continuous or periodic).

4.7.4.44 Within this assessment, the magnitude of impact is defined by the criteria presented in Table 4.7.11.

Table 4.7.11: Criteria to assess the magnitude of impact.

Magnitude	Definition
Large	<p>Adverse: Loss of resource and/or quality and integrity of resource or severe damage to key characteristics, features or elements, such that the post-development character of the archaeological asset would be fundamentally or considerably changed.</p> <p>Beneficial: Total or considerable protection and understanding gained from key elements or features above and beyond the pre-development conditions, such that the post-development character and quality of the archaeological heritage asset would be fundamentally better understood.</p>
Medium	<p>Adverse: Loss of resource, but not adversely affecting the integrity, or partial loss of/damage to key characteristics, features or elements, such that the post-development character of the archaeological heritage asset would be partially changed.</p> <p>Beneficial: Protection and understanding gained from key elements or features above the pre-development conditions, such that the post-development character and quality of the archaeological heritage asset would be considerably better understood.</p>
Small	<p>Adverse: Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.</p> <p>Beneficial: Minor benefit to, or in addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk or negative impact occurring.</p>
Negligible	<p>Adverse: Very minor loss of detrimental alteration to one or more characteristics, features or elements.</p> <p>Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.</p>

### Significance of effects

- 4.7.4.45 As set out in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**, the general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels.
- 4.7.4.46 Evaluations of the magnitude of impacts will be combined with evaluations of the sensitivity of receptors, undertaken using professional judgement, to provide a resulting significance of effect that will be considered as **Significant** or **Not Significant** for the purposes of the PEIR assessment.

## Assumptions and Limitations

### Archives data

- 4.7.4.47 Data used to compile this report consists of secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this assessment. The assumption is made that the data, as well as that derived from other secondary sources, are reasonably accurate.
- 4.7.4.48 The records held by the United Kingdom Hydrographic Office (UKHO), National Mariner Heritage Record (NMHR), Historic Environment Records (HERs) of Suffolk and Kent, and the other sources used in this assessment are not a record of all surviving cultural heritage assets, rather a record of the discovery of a wide range of archaeological and historical components of the marine historic environment. The information held within these datasets is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown. In particular, this relates to buried archaeological features.
- 4.7.4.49 The data supplied by the UKHO, NMHR and HERs were obtained between March and April 2022 and will not be refreshed for the duration of the proposed Project. As a result, any new records that are entered into these archives may not be included within this, or future, deliverables.
- 4.7.4.50 Data supplied by the UKHO, NMHR and HERs have been converted, from the coordinate system they were supplied in, to the Project coordinate system, ETRS89 UTM31N. However, some records within the NMHR shapefiles (supplied in WGS84 lat/long) were not placing in the correct location on the Wessex Archaeology project GIS according to the BNG positions in the accompanying records. As a result, this dataset had to be recreated using the BNG positions and subsequently converted to ETRS89 UTM31N.

### Geoarchaeological data

- 4.7.4.51 Cores obtained in September 2021 were targeted and used for engineering lab testing prior to their geoarchaeological analysis. Although parts of these cores still exist, Wessex Archaeology's geoarchaeologists believed there was little potential for the next stage of recording of these samples as it is assumed that they had since been at least partly destroyed, disturbed or bagged, losing any stratigraphic context or dating opportunity. Therefore, the vibrocores were not usable for the Stage 2 assessment.
- 4.7.4.52 Additional geoarchaeological surveys are planned for Summer 2023 and eight duplicate vibrocores will be obtained to allow the Stage 2 assessment to be undertaken.
- 4.7.4.53 The 69 vibrocores from the MMT survey were located within the wider Offshore Scoping Boundary and therefore do not cover the entire extent of the Offshore Scheme Boundary. Further marine geotechnical surveys are planned for Summer 2023 to cover these specific areas.
- 4.7.4.54 The results of further geotechnical survey work will be included in the ES.

### Geophysical data

- 4.7.4.55 The geophysical survey is defined as the extents of the SSS dataset, within the wider Offshore Scheme Scoping Boundary. Therefore, the datasets do not cover the entire

extent of the Offshore Scheme Boundary (**Figure 4.7.1 Marine Archaeological study area**). Further marine geophysical surveys are planned for Summer 2023 to cover these specific areas, the results of which will be incorporated into the ES.

4.7.4.56 In terms of the geophysical data collected and assessed in this appendix, the individual data sets were assessed and rated for quality (good, average, below average and variable), and the quality assessment is as follows:

- SBP data – good. Data were mostly clear and largely unaffected by sea state or weather conditions;
- MBES – good. Data were suitable for archaeological assessment of features over 0.2m in size;
- SSS data – average. Some data files displayed weather noise and cable snatching due to sea state and/or weather conditions; and
- Mag. data – average. Some influence from background geology which may have masked some smaller features and some impacts from weather conditions are visible. The 50m line spacing offshore meant that smaller ferrous features were not picked up in the data.

4.7.4.57 The worst-case scenario has been adopted to cope with uncertainties and reduce risk of later design modifications falling outside of the assessment envelope.

#### **Intertidal survey data**

4.7.4.58 An archaeological walkover survey has not yet been undertaken within the intertidal area of the two landfalls. The surveys will take place during the Summer of 2023 and the methodology and results will be included in the ES.

### **4.7.5 Basis of Assessment**

4.7.5.1 This section sets out the assumptions that have been made in respect of design flexibility maintained within the Proposed Project and the consideration that has been given to alternative scenarios and the sensitivity of the preliminary assessment to changes in the construction commencement year.

4.7.5.2 Details of the available flexibility and assessment scenarios are presented in **Volume 1, Part 1, Chapter 4 Proposed Project Description** and **Part 1, Chapter 5 PEIR Approach and Methodology**.

#### **Flexibility Assumptions**

4.7.5.3 The main preliminary assessments have been undertaken based on the description of the Proposed Project provided in **Volume 1, Part 1 Chapter 4 Description of the Proposed Project**. To take account of the flexibility allowed in the Proposed Project, consideration has been given to the potential for preliminary effects to be of greater or different significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LoD) or draft order Limits.

4.7.5.4 The assumptions made regarding the use of flexibility for the main assessment, and any alternatives assumptions are set out in Table 4.7.12 below.

Table 4.7.12: Flexibility assumptions

<b>Element of flexibility</b>	<b>Proposed Project assumption for initial preliminary assessment</b>	<b>Flexibility assumption considered</b>
Lateral LoD marine HVDC cable	The extent of the Offshore Scheme Boundary for the Proposed Project.	The worst-case scenario assessed for the Offshore Scheme is one bundled HVDC (x2) and one fibre optic cable in once trench.  This bundled scenario maybe placed anywhere within the Offshore Scheme Boundary.

## Coordination Including Co-Location

- 4.7.5.5 The Proposed Project includes an option for co-location with National Grid Ventures proposed Nautilus and LionLink interconnector projects as explained in **Volume 1, Part 1, Chapter 5 PEIR Approach and Methodology**.
- 4.7.5.6 Table 4.7.13 details where the option of co-location is relevant to the preliminary marine archaeological assessment and how this option has been assessed and reported in section 4.7.9, preliminary assessment of effects.

Table 4.7.13: Consideration of co-location

<b>Element of coordination</b>	<b>How it has been considered within the preliminary assessment</b>
Suffolk landfall	<b>Sea Link Only</b>  Four Horizontal Directional Drilling (HDD) ducts (one per cable and one spare).  <b>Sea Link (with co-location)</b>  Up to ten HDD ducts.

## Sensitivity Test

- 4.7.5.7 It is likely that under the terms of the draft DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Consideration has been given to whether the preliminary effects reported would be any different if the works were to commence in any year up to year five. Where there is a difference this is reported in section 4.7.9, preliminary assessment of effects.



## 4.7.6 Study Area

- 4.7.6.1 The study area comprises the extent of the Offshore Scheme Boundary supplied 28 February 2023) (**Figure 4.7.1 Marine Archaeological study area**).
- 4.7.6.2 It should be noted that the geophysical and geotechnical surveys are defined as the extent of the SSS dataset within the wider Offshore Scheme Scoping Boundary and does not cover the entire study area.
- 4.7.6.3 Marine archaeological sites identified in the geophysical survey data that are located outside the study area, but their linear/polygon extents or their associated mitigation (in the form of AEZs), intersect with the study area have also been included in this assessment. Sites that are located extremely close to the boundary of the study area (usually within 5m) have also been included where they could represent buried ferrous material and their dimensions are unknown.

## 4.7.7 Baseline Conditions

- 4.7.7.1 The baseline conditions within the study area are summarised below with regard to: palaeogeography; seabed features including maritime and aviation sites; intertidal heritage assets; and the historic seascape character of the region. A technical report comprising the full archaeological assessment of geophysical and geotechnical survey data and the desk-based review of available datasets and research is appended to this chapter (**Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report.**).

### Palaeogeography

#### Current baseline

- 4.7.7.2 There are no designated sites or known sites of prehistoric date within the study area.
- 4.7.7.3 The identified geology of the study area has been divided into four distinct units, summarised as:
- Units 1 a - b: solid, pre-Quaternary bedrock not considered to be of archaeological potential;
  - Unit 2: Plio-Pleistocene marine deposit pre-dating the earliest known occupation of Britain and therefore not considered to be of archaeological potential;
  - Units 3 a - d: Pleistocene and early Holocene sediments visible in SBP data as both buried and underfilled palaeochannels, and cut and fill features containing deposits of sands, gravels, silts, clays and peats. These deposits have the potential to contain both *in situ* and derived archaeological material, alongside preserved organic remains of potential palaeoenvironmental importance; and
  - Unit 4: modern seabed sediment that have the potential to contain re-worked artefacts and may cover wreck sites and other cultural heritage in areas of sufficient thickness.
- 4.7.7.4 The palaeogeographic assessment, supported by the geotechnical review, for the study area identified several features of archaeological potential located within the Unit 3 sediments (**Figure 4.7.2 Palaeogeographic receptors of archaeological potential and geoarchaeological priority of vibrocores A-H**), comprising:

- Eleven channels: one of which contained alluvium and peat interpreted as being of high paleoenvironmental potential (**75006**) and another two that contained organic material interpreted as being of medium paleoenvironmental potential (**75015** and **75032**). The remaining channels may relate to features of archaeological interest and have the potential to contain palaeoenvironmental material although no corresponding vibrocore data was obtained;
- One high amplitude reflector (**75017**) located within a channel (**75018**) that may suggest possible organic material is present and is considered to be of high archaeological potential;
- Three channel complexes that are potentially part of the offshore route of the Thames/Medway river system and have the potential to contain palaeoenvironmental material (**75029**, **75030** and **75031**);
- Eleven simple cut and fill features: one of which contained alluvium interpreted as being of medium paleoenvironmental potential (**75024**);
- One complex cut and fill feature that is considered to be of medium archaeological potential since the origin of the feature cannot be confirmed without further investigation (**75023**); and
- Three areas of acoustic blanking that have the potential to be shallow gas which may have been caused by the microbial breakdown of organic matter and therefore may contain sediments of palaeoenvironmental interest (**75007**, **75009** and **75016**).

### **Value and sensitivity**

- 4.7.7.5 Whilst there are no designated sites or known sites of prehistoric date within the study area, there is potential for prehistoric archaeological material to be discovered during seabed works associated with the Proposed Project.
- 4.7.7.6 Based on age and the rarity of Palaeolithic and Mesolithic finds in marine contexts, if any sites or material was discovered, they would likely be of **very high**, probably national, archaeological importance. A guidance note published by English Heritage (now Historic England) Identifying and Protecting Palaeolithic Remains: archaeological guidance for planning authorities and developers (1998) indicated that sites containing Palaeolithic features are so rare in Britain that they should be regarded as nationally important and wherever possible should remain undisturbed. This was reiterated in Historic England's 2023 guidance, Curating the Palaeolithic.
- 4.7.7.7 All palaeogeographic features and material are fragile and non-renewable and have the potential to be damaged or destroyed if they are directly impacted during the seabed preparation and construction phases of the Proposed Project. Any damage to archaeological sites or material is permanent and recovery is limited to stabilisation or reburial, limiting further impact. There is no potential for the recoverability of any buried deposits if they are affected following a direct impact. Therefore, the overall sensitivity of palaeogeographic features and material should be regarded as **very high**.

## Seabed features

### Current baseline

- 4.7.7.8 There are currently no maritime or aviation sites within the study area that are subject to statutory protection.
- 4.7.7.9 Within the study area, a total of 722 geophysical anomalies were identified as being of possible archaeological potential and are discriminated as shown in Table 4.7.14.

Table 4.7.14: Anomalies of archaeological potential within the study area.

Archaeological discrimination	Quantity	Interpretation
A1	26	Anthropogenic origin of archaeological interest
A2_h	295	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature
A2_l	396	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature
A3	5	Historic record of possible archaeological interest with no corresponding geophysical anomaly
<b>Total</b>	<b>722</b>	

- 4.7.7.10 An additional 16 seabed features are also located within the study area beyond the boundary of the geophysical survey area or were not included in the geophysical survey assessment due to the detail in the UKHO record indicating that the site had not been identified for some time or that the site relates to a modern site.
- 4.7.7.11 The geophysical anomalies and additional 16 records are illustrated on **Figure 4.7.3 Seabed receptors of archaeological potential A-T** and can be further classified by probable type, as shown in Table 4.7.15.

Table 4.7.15: Types of anomalies identified.

Anomaly/ record classification	Definition	Number of geophysical anomalies	Number of additional records
Wreck	Areas of coherent structure including wrecks of ships, submarines and some aircraft (where coherent structure survives)	13	-
Debris field	A discrete area containing numerous individual debris items that are potentially anthropogenic, and can include dispersed wreck	31	-

<b>Anomaly/ record classification</b>	<b>Definition</b>	<b>Number of geophysical anomalies</b>	<b>Number of additional records</b>
	sites for which no coherent structure remains		
Debris	Distinct objects on the seabed, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin	70	-
Seabed disturbance	An area of disturbance without individual, distinct objects. Potentially indicates wreck debris or other anthropogenic features buried just below the seabed.	16	-
Rope/chain	Curvilinear dark reflectors, often with a small amount of height, indicating rope or chain (if ferrous)	35	-
Bright reflector	Individual objects or areas of low reflectivity, characteristic of materials that absorb acoustic energy, such as waterlogged wood or synthetic materials. Precise nature is uncertain	1	-
Dark reflector	Individual objects or areas of high reflectivity, displaying some anthropogenic characteristics. Precise nature is uncertain	89	-
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris.	39	-
Magnetic trend	Linear trend of individual magnetic anomalies which appear to be associated, with no associated seabed surface expression, and have the potential to represent possible ferrous debris.	2	-
Magnetic	No associated seabed surface expression, and have the potential to represent possible buried ferrous debris or buried wreck sites	421	-
Recorded Wreck	Position of a recorded wreck at which previous surveys have identified definite seabed anomalies, but for which no associated feature has been identified within the current data set.	5	10

<b>Anomaly/ record classification</b>	<b>Definition</b>	<b>Number of geophysical anomalies</b>	<b>Number of additional records</b>
Obstruction	Recorded by the UKHO or NMHR as a seabed obstruction.	-	6
<b>Total</b>		<b>722</b>	<b>16</b>

4.7.7.12 There are no known aircraft crash sites in the study area. Nonetheless, there is the potential for aircraft or aircraft-related debris to exist on the seafloor of the study area, potentially as one of the 691 A2 anomalies.

### **Value and sensitivity**

4.7.7.13 The perceived value of an individual asset is generally assessed and assigned on a site-by-site basis. Those regarded as being of special interest may be designated under relevant legislation.

4.7.7.14 There are no known records of aircraft crash sites within the study area.

4.7.7.15 Fourteen of the named vessels were lost during the First or Second World Wars and are all considered to have high archaeological value due to the importance of their military involvement during the wars (**2007-2008, 2015-2018, 7558, 7173, 7414, 7346, 7472, 7269, 7494 and 7495**).

4.7.7.16 Three records relate to relatively recent losses, and whilst they are still potential seabed hazards, they are considered to have negligible archaeological value (**2006, 2012, 2020**).

4.7.7.17 In accordance with the precautionary approach, the un-named wrecks are considered as high value assets until proven otherwise (**7116, 7120, 7176, 7232, 7426, 7721 7231, 7241, 7284 and 7500**). Similarly, as the value of potential shipwrecks and aircraft cannot be evaluated until they are discovered, potential wrecks of all periods should be expected to be of high value until proven otherwise.

4.7.7.18 As there is insufficient information to assess the value of each individual unidentified anomaly identified in the geophysical assessment (A1, A2\_h and A2\_l), all these additional anomalies must be considered to have **high** archaeological value until more information becomes available.

4.7.7.19 As the value of potential shipwrecks cannot be evaluated until they are discovered, potential wrecks of all periods should be expected to be of **high** value, in accordance with the precautionary approach. Aircraft are considered to have significance for remembrance and commemoration, but also have an implicit heritage value as historic artefacts, providing information on the aircraft itself and also the circumstances of its use and loss (Ref 7.19). In addition, all aircraft that crash while in military service are protected under the Protection of Military Remains Act 1986, and therefore should be considered as designated sites until proven to be non-military. On this basis, all potential aircraft sites are of **high** value.

4.7.7.20 Derived artefacts are likely to be of limited archaeological value as individual discoveries. However, the occurrence of a number of seemingly isolated objects within a particular area has the potential to indicate shipping routes or maritime battlegrounds, or possibly even indicate the presence of a hitherto unknown wreck site. Isolated maritime finds are, therefore, regarded as being of **medium** archaeological

value. Isolated aircraft finds are considered as being of **medium** archaeological value as they may provide insight into patterns of historical aviation across the Study Area or indicate the presence of uncharted aircraft crash sites.

- 4.7.7.21 There is potential for the presence of archaeological material of a maritime nature, spanning from the Mesolithic period to the present day within the study area. The potential is summarised by general date ranges, based on the Selection Guide: Boats and Ships in Archaeological Contexts (Ref 7.51) and is presented in **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**.
- 4.7.7.22 The potential for further discoveries has been explored further through the assessment of Recorded Losses, navigational hazards and potential for preservation. These are summarised here but discussed in more detail in **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**.
- 4.7.7.23 Recorded Losses refer to ships and aircraft that are recorded as having been lost, but for which the exact locations are not known, and no material has been encountered on the seabed within the Named Location. The NMHR, SHER and KHER datasets have 103 records of Recorded Losses located within five Named Location polygons that intersect with the boundary of the study area. This total comprises 102 ships and one aircraft. Further details regarding these losses are provided in **Volume 2, Appendix 4.7.A, Marine Archaeological Technical Report**. Overall, Recorded Losses suggest general potential for types and character of vessels moving through the study area and aircraft losses over time. The vessels date from the 13th century to the modern period, cover a wide range of vessel types and suggest causes of loss including being driven ashore, loss during storms and collision. The NMHR Recorded Loss for an aircraft crash site records the location of a B-17 Flying Fortress within the study area (NMHR\_1602379). A walkover survey was undertaken in 2017 to inform the Thanet Extension Offshore Wind Farm and the remaining material associated with the aircraft were located on Sandwich Flats to the south of Pegwell Bay (Ref 7.56). The NMHR record for this site has not since been updated and therefore the position for the aircraft is incorrect and does not impact the Proposed Project.
- 4.7.7.24 In terms of navigational hazards, the study area traverses several coastal and offshore AMAPs (generally associated with the navigational hazards above) that are all defined as having fine-grained sediments and therefore a high potential of preservation. The remaining study area covered by the project assessment comprises a mixture of the high potential fine-grained sediments and further offshore, more coarse-grained sediments that have a lower potential of preservation (Ref 7.57).
- 4.7.7.25 The study area is generally considered to be an exposed coastal area with offshore banks that, at the Kent landfall, may provide shelter. The northern element of the study area is characterised as being particularly exposed to north-easterly and easterly winds with shallow muddy foreshore and banks inshore. The study area also traverses an offshore area that is considered to be exposed to all wind directions, which is proven by the substantial number of Recorded Losses for vessels that foundered as a result of poor weather conditions. Furthermore, the mudflats of Pegwell Bay and Sizewell Bank also present a considerable navigational hazard at both landfalls. Due to this region being a heavily used shipping route around the UK, into London and also internationally, another hazard to maritime vessels would be collision. This is recorded on several records associated with Recorded Losses across the study area.
- 4.7.7.26 A summary of the value of the currently known and potential seabed features, are presented in Table 4.7.16.

Table 4.7.16: Archaeological value of seabed features.

<b>Asset type</b>	<b>Definition</b>	<b>Total</b>	<b>Value</b>	
Known assets	Named shipwreck sites of anthropogenic origin (A1) - sunk during the First and Second World Wars ( <b>7558, 7173, 7414, 7346, 7472, 7269, 7494</b> )	7	<b>High</b>	
	Un-named shipwreck sites of anthropogenic origin (A1) ( <b>7116, 7120, 7176, 7232, 7426, 7721</b> )	6	<b>High</b>	
	Debris of anthropogenic origin (A1)	2	<b>High</b>	
	Debris fields of anthropogenic origin (A1)	5	<b>High</b>	
	Magnetic anomalies of anthropogenic origin (A1)	6	<b>High</b>	
	Historic record of possible archaeological interest with no corresponding geophysical anomaly	Named recorded A3 wreck ( <b>7495</b> )	1	<b>High</b>
		Un-named recorded A3 wrecks ( <b>7231, 7241, 7284</b> and <b>7500</b> )	4	<b>High</b>
		Additional recorded UKHO and NMHR modern named wrecks ( <b>2006, 2012, 2020</b> )	3	<b>Negligible</b>
		Additional recorded UKHO and NMHR named wrecks sunk during the First and Second World Wars ( <b>2007-2008, 2015-2018</b> )	6	<b>High</b>
		Additional recorded UKHO and NMHR un-named wrecks ( <b>2005</b> )	1	<b>High</b>
Additional recorded UKHO and NMHR obstructions ( <b>2002, 2003, 2009, 2013, 2014</b> and <b>2019</b> )		6	<b>Medium</b>	
Additional geophysical anomalies	Anomalies identified during the geophysical assessment that are of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature (A2_h).	295	<b>High</b>	
	Anomalies identified during the geophysical assessment that are of possible anthropogenic origin, but interpretation is uncertain; may be anthropogenic or a natural feature (A2_l)	396	<b>High</b>	
Potential wrecks	Shipwrecks that are yet to be discovered within the study area.	-	<b>High</b>	

Asset type	Definition	Total	Value
	Aircraft that are yet to be discovered within the study area.	-	High
Potential derived maritime artefacts	Isolated artefacts lost from a boat or ship or moved from a wreck site.	-	Medium
	Isolated artefacts lost from an aircraft or moved from an aircraft crash site.	-	Medium

4.7.7.27 All archaeological seabed features are fragile and non-renewable and have the potential to be damaged or destroyed if they are directly or indirectly impacted during the seabed preparation and construction phases of the Proposed Project. Any damage to archaeological sites or material is permanent and recovery is limited to stabilisation or reburial, limiting further impact. There is no potential for the recoverability of any seabed features if they are affected by a direct or adverse indirect impact. Therefore, the overall sensitivity of known and potential wrecks, aircraft and associated material and debris should be regarded as **very high**.

## Intertidal features

### Current baseline

- 4.7.7.28 There are currently no intertidal sites within the study area that are subject to statutory protection. Archaeological walkover surveys within the intertidal area of the two landfalls are planned to take place during the Summer of 2023 and the methodology and results will be included in the ES.
- 4.7.7.29 At present within the study area, there are a total of four records relating to archaeological sites and findspots (**Figure 4.7.4 Intertidal receptors of archaeological potential**).
- 4.7.7.30 At the Suffolk landfall there is one terrestrial site relating to an extensive length of Second World War beach scaffolding, part of a much longer stretch of anti-invasion defence along the east coast. These sites are no longer visible, however, it is possible that material from these features could remain, buried, although, any material is likely to be fragmentary (**1001**).
- 4.7.7.31 There are three terrestrial records located at the Kent landfall, comprising a findspot relating to a circular metal rim that was found protruding from the sand (**1003**); an alignment of 81 posts located in the intertidal zone preventing airborne and seaborne invasion during the Second World War (**1004**); and a rifle range that was first visible on the 1st Edition Ordnance Survey (OS) mapping from 1877 and no longer in use on the 1908 edition (**1005**).

### Value and sensitivity

- 4.7.7.32 The perceived value of an individual asset is generally assessed and assigned on a site-by-site basis. Those regarded as being of special interest may be designated under relevant legislation.
- 4.7.7.33 Most of the terrestrial sites in the intertidal area have since been removed from their context. The value of the findspot is not relevant (**negligible**) as it has most likely been removed from its location and will not be impacted by the Proposed Project. If any



Second World War material is discovered during works associated with the Proposed Project, these would have to be assessed within the wider setting of military events and coastal defences. However, the value of such material, if discovered, would be of **low** archaeological value as it will relate to a modern site which were a common occurrence on most coastlines of south and east Britain during the war. It is unknown whether material associated with the rifle range is still present in the intertidal area (**1005**), however such material would be considered of **low** archaeological value since 19th century ranges were common across Britain.

4.7.7.34 A summary of the value of the intertidal archaeological resource is presented in Table 4.7.17.

Table 4.7.17: Archaeological value of intertidal heritage assets.

Asset type	Definition	Total	Value
Known features	Findspots ( <b>1003</b> )	1	<b>Negligible</b>
	Military structures ( <b>1001</b> , <b>1004</b> and <b>1005</b> )	3	<b>Low</b>
Potential derived intertidal sites	Sites discovered within the intertidal area.	-	<b>High</b>
Potential derived intertidal artefacts	Isolated artefacts and findspots dating to all periods which are located within the intertidal area.	-	<b>Medium</b>

4.7.7.35 All intertidal heritage assets are fragile and non-renewable and have the potential to be damaged or destroyed if they are directly impacted during the seabed preparation and construction phases of the Proposed Project. Any damage to archaeological sites or material is permanent and recovery is limited to stabilisation or reburial, limiting further impact. There is no potential for the recoverability of any intertidal heritage assets if they are affected by a direct impact. Therefore, the overall sensitivity of known and potential intertidal heritage assets should be regarded as **very high**.

## Historic Seascape Characterisation

### Current baseline

4.7.7.36 The assessment of the HSC within the study area was undertaken using the results of LUC's 2107 Historic Seascape Characterisation (HSC): Consolidating the National HSC Database (Ref 7.47), which consolidated the eight existing HSC implementation projects (undertaken between 2008 and 2015) into a single national database.

4.7.7.37 The method assesses and defines areas with HSC types that promote an understanding of historic trends and processes, to inform the sustainable management of change over time.

4.7.7.38 The study area has been characterised as having the following elements:

- reclaimed land (from tidal marsh);
- cultural topography landward (wetland);

- recreation (open ground, wildlife watching);
- reclaimed land (from tidal marsh);
- settlement (urban);
- recreation (parks and gardens; wildlife watching);
- reclaimed land (from tidal marsh);
- fishing (bottom trawling, drift netting, potting);
- maritime safety (buoyage, safety area);
- navigation (wreck hazard, hazardous water, navigation route, shoals and flats, ferry crossing);
- ports and docks (dockyard, harbour);
- recreation (leisure beach, leisure sailing, wildlife watching);
- cultural topography landward (wetland);
- cultural topography marine (palaeochannel);
- energy industry (submarine power cable, renewable energy installation (wind)); and
- telecommunications (submarine telecommunications cable).

### Value and sensitivity

- 4.7.7.39 The HSC of the study area is considered to be of **medium** archaeological value, due to the region's important and prolonged maritime history and its continued use today. The nature of HSC is such that it reflects not only the past character of the seascape but also the present, and the current HSC is already characterised by the broad category of energy industry, more specifically, submarine power cables. Therefore, the overall character of the area will remain predominantly the same during the construction and operation of the Proposed Project.
- 4.7.7.40 Furthermore, the HSC will be able to tolerate and recover from the activities associated with the Proposed Project and therefore has an overall **medium-low** sensitivity.

### Future Baseline

- 4.7.7.41 If undisturbed by the Proposed Project, there would be no change to the baseline conditions discussed above beyond those caused by natural physical processes and natural deterioration.
- 4.7.7.42 Direct impact to the physical baseline resource may occur post-consent where mitigation measures are insufficient to protect the archaeological resource or are not established prior to interaction with the seabed occurring. Physical environment processes may also occur that could have either a beneficial or adverse secondary impact on marine heritage.
- 4.7.7.43 With regards to HSC, the study area already includes submarine power cables and therefore the Proposed Project will not cause additional impact on the HSC of the study area.

- 4.7.7.44 When considered alongside other developments in the region, it is possible that the Proposed Project could have a cumulative impact on the current baseline resource.
- 4.7.7.45 An archaeological walkover survey will be undertaken within the intertidal area of both landfalls during the Summer of 2023 and the methodology and results will be included in the ES. The results of the walkover survey will provide up-to-date understanding of the baseline for the intertidal areas and will supplement the intertidal heritage assessment.
- 4.7.7.46 Further marine geophysical and geotechnical surveys will also be carried out in Summer 2023; the results of which will be incorporated into the overall marine archaeological assessment for the study area and presented in the ES. Again, the results will provide an update to the overall baseline for the study area.

## 4.7.8 Mitigation

- 4.7.8.1 As set out in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**, mitigation measures typically fall into one of the three categories: embedded measures; control and management measures; and mitigation measures.

### Embedded Measures

- 4.7.8.2 Embedded measures have been integral in reducing the effects of the Proposed Project on the marine archaeological resource. Measures that have been incorporated are:
- Sensitive routing and siting of infrastructure and temporary works; and
  - Commitments made within **Volume 2, Appendix 1.4.F, Outline Schedule of Environmental Commitments and Mitigation**.

### Control and Management Measures

- 4.7.8.3 The following measures have been included within **Volume 2, Appendix 1.4.A, Outline Code of Construction Practice** relevant to the control and management of impacts that could affect marine archaeological receptors:
- H01 - Locations of known archaeological interest/value, or areas where archaeological work is planned, will be signposted/fenced off to avoid unintentional damage;
  - H02 - Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the project will inform the local planning authority and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the project parameters;
  - GM01 - Designated (and as minimal as possible) anchoring areas and protocols shall be employed during marine operations to minimise physical disturbance of the seabed;
  - GM02 - As-built locations of cable and external protection will be supplied to UKHO (Admiralty) and Kingfisher (KIS-ORCA);

MA01 - A Written Scheme of Investigation (WSI) including a Protocol for Archaeological Discoveries will be agreed with the Archaeological Curator via the Regulator and implemented (**Appendix 4.7.B Written Scheme of Investigation**) prior to works commencing. Unavoidable impacts to potential archaeological receptors would be addressed through a series of agreed control and management measures to deal with the discoveries once impacts have occurred. These measures would be outlined in a WSI and would be in place throughout the construction, operation, maintenance and decommissioning phases. The WSI would address unavoidable impacts that may occur anywhere in the Offshore Scheme and particularly where the nature of the Proposed Project means that some details have not been confirmed when an application is submitted, allowing flexibility within clearly defined parameters (Rochdale Envelope or Design Envelope) in accordance with archaeological best practice. A project-specific Protocol for Archaeological Discoveries will be established to support the reporting of unexpected archaeological material during the lifetime of the Project. Impact to unexpected archaeological material is reduced by promptly receiving archaeological advice and undertaking recording and/or conserving any objects that have been disturbed. Additional investigation of features with an uncertain identity or archaeological value can often mean their true nature and value can be better understood. A Protocol for Archaeological Discoveries reduces the impact on the marine historic environment by enabling Project staff to report their finds in a manner that is convenient and effective. Any additional marine geophysical survey, diver or ROV survey footage that takes place within the area will be assessed by a suitably qualified marine geophysicist or marine archaeologist, as appropriate. If an archaeologically important site is subsequently discovered during Project works, a temporary exclusion zone (TEZ) will be established to allow for further investigation to take place. The TEZ would then be re-evaluated, removed or expanded, based on the results of further investigations;

- MA02 - A Written Scheme of Investigation (WSI) will also include offsetting of archaeological impact where necessary through the completion of a palaeo-environmental assessment of deposits of high geoarchaeological potential which may be disturbed;
- MA03 - The project will be run in compliance with all relevant legislation, consents and permits, for example the Marine and Coastal Access Act 2009 (Ref 7.1), Protection of Military Remains 1986 (Ref 7.4), Merchant Shipping Act 1995 (Ref 7.5), Protection of Wrecks Act 1973 (Ref 7.2) and Ancient Monuments and Archaeological Areas Act 1979 (Ref 7.3);
- MA04 - Locations of known marine archaeological interest/value within the marine environment will be avoided by all marine vessels by the implementation of appropriately sized Archaeological Exclusion Zones (AEZs). No works that could impact the seabed will be undertaken within the extent of an AEZ during the construction, operation and maintenance, or decommissioning phases of the Offshore Scheme. AEZs may be amended (enlarged, reduced, moved or removed) because of further data assessment or archaeological field evaluation and must be undertaken in consultation with the Archaeological Curator, Historic England. The locations and extents of all recommended AEZs are shown in Table 4.7.18, and are presented in the Written Scheme of Investigation (**Volume 2, Appendix 4.7.B, Written Scheme of Investigation**);
- MA05 - Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of

application, the project will inform the MMO, as advised by Historic England, and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the project parameters;

- MA06 - Archaeological features of lower archaeological value will be avoided where practicable. Micro-siting of the cable route and siting of infrastructure and temporary works will help to avoid seabed features, such as geophysical anomalies of archaeological potential. It is recommended that consultation with the archaeological consultant is undertaken with regards to routing around such anomalies of archaeological potential;
- MA07 – Archaeological input at the planning stages of any further survey work should be undertaken. Archaeological Method Statements will be prepared for the following additional works: ground truthing of anomalies (e.g. Remotely Operated Vehicle (ROV), diver survey or coordination with UXO campaigns); marine geophysical or geotechnical surveys; intertidal or marine watching briefs; measures to protect marine heritage assets from indirect impacts (e.g. physical buffers); and post-construction monitoring works. Method Statements will be prepared by a suitably qualified, experienced, and accredited marine archaeological consultant and will require approval by the Regulator (the MMO), and the Archaeological Curator (Historic England for marine works and the respective local authority curatorial bodies that serve Suffolk and Kent for works in the intertidal zone). See the Mitigation Measures section below for additional works that will require archaeological Method Statements;
- MPE01 - During the course of cable route clearance, specific activities will be completed to remove items from the seabed. Out of Service cables will be removed as per industry guidelines, larger debris including lost fishing gear will be removed prior to cable installation and a pre-lay grapnel run will be completed to ensure smaller debris is removed. In the event that abandoned, lost or discarded fishing gear ('ALDFG') is encountered, it may be necessary in certain circumstances to bring ALDFG onto the vessel deck. In these instances, marked ALDFG will be returned to the local MMO/ Inshore Fisheries and Conservation Authority (IFCA) for onward retrieval by the owner of the marked gear, in line with existing best practice. Not all gear (particularly 'active' gear) is marked; if necessary to bring onto the vessel deck, unmarked gear will be disposed of via conventional onshore waste channels. Recovered objects identified as 'wreck' must be reported to the Receiver of Wreck within 28 days under the obligations of the Merchant Shipping Act 1995 (Ref 7.5) and must be stored and maintained at the finder's expense until a decision is made on ownership. It is recommended that advice is sought from the marine archaeological consultant with regards survey campaigns and data assessments, to ensure, where possible, 'wreck' of possible or known archaeological interest can be avoided and left *in situ*;
- MPE02 - The minimum depth of lowing (DOL) to the top of the cable is 0.5 m (in areas of bedrock), with a target DOL for the Proposed Project approximately 1.5 m to 2.5 m, to be achieved where possible dependant on the seabed geology; and
- MPE03 - Cable protection features (e.g. rock placement, mattresses and grout bags) will be installed only where considered necessary for the safe operation of the Project.

Table 4.7.18: Recommended AEZs within the study area.

WA ID	Classification/ Wreck category	Position (ETRS89 UTM31N)		Exclusion zone
		Easting	Northing	
2005	Dangerous wreck	407527	5759249	50m buffer around UKHO position
2006	Dangerous wreck (dead)	407342	5757133	25m buffer around UKHO position
2007	Dangerous wreck	406725	5756364	100m buffer around UKHO position
2008	Dangerous wreck (dead)	406124	5750234	25m buffer around UKHO position
2012	Dangerous wreck	399656	5700989	50m buffer around UKHO position
2015	Dangerous wreck	396319	5687285	100m buffer around UKHO position
2016	Dangerous wreck	396677	5687300	100m buffer around UKHO position
2017	Wreck	396601	5686840	25m buffer around NMHR position
2018	Dangerous wreck	396458	5686181	100m buffer around UKHO position
2020	Wreck (dead)	389200	5685809	25m buffer around UKHO position
7116	Wreck	407157	5779594	50m buffer around current feature extent
7120	Wreck	407875	5778194	50m buffer around current feature extent
7173	Wreck	408301	5772170	50m buffer around current feature extent
7174	Debris field	408312	5772193	25m buffer around current feature extent
7176	Wreck	408288	5772083	50m buffer around current feature extent
7177	Debris	408291	5772108	25m buffer around recorded position
7178	Debris field	408294	5772085	25m buffer around current feature extent
7231	Recorded wreck	408207	5764777	100m around recorded position
7232	Wreck	406866	5761733	50m buffer around current feature extent

WA ID	Classification/ Wreck category	Position (ETRS89 UTM31N)		Exclusion zone
		Easting	Northing	
7241	Recorded wreck	406658	5759338	100m around recorded position
7269	Wreck	406448	5750777	50m buffer around current feature extent
7270	Debris field	406438	5750789	25m buffer around current feature extent
7284	Recorded wreck	407938	5747882	100m around recorded position
7346	Wreck	412020	5733762	50m buffer around current feature extent
7414	Wreck	399938	5701754	50m buffer around current feature extent
7426	Wreck	399876	5700385	50m buffer around current feature extent
7430	Debris field	399891	5700390	25m buffer around current feature extent
7433	Debris	399846	5700382	25m buffer around recorded position
7434	Debris field	399899	5700368	25m buffer around current feature extent
7472	Wreck	400613	5693545	50m buffer around current feature extent
7487	Magnetic	399532	5691524	50m around recorded position
7494	Wreck	398780	5690035	50m buffer around current feature extent
7495	Recorded wreck	398693	5689906	100m around recorded position
7500	Recorded wreck	399517	5691466	100m around recorded position
7558	Wreck	396356	5685266	50m buffer around current feature extent
7608	Magnetic	394774	5685247	50m around recorded position
7612	Magnetic	394619	5685125	50m around recorded position
7613	Magnetic	394568	5685116	50m around recorded position
7631	Magnetic	393912	5684931	50m around recorded position

WA ID	Classification/ Wreck category	Position (ETRS89 UTM31N)		Exclusion zone
		Easting	Northing	
7647	Magnetic	393042	5685011	50m around recorded position
7721	Wreck	389778	5685519	50m buffer around current feature extent

## Mitigation Measures

4.7.8.4 Mitigation measures are additional topic and site-specific measures that have been applied to mitigate or offset any likely significant effects. Mitigation measures included that are relevant to marine archaeological receptors are:

- Where sensitive routeing and siting of infrastructure and temporary works around marine heritage assets is not possible, anomaly investigation will be undertaken to confirm the nature and value of the seabed anomaly. Methods of ground truthing assessment could include ROV or diver survey and could be undertaken in conjunction and in coordination with other surveys associated with the Offshore Scheme, for example unexploded ordnance (UXO) or obstruction surveys. All relevant information and data derived from such surveys should be assessed by a suitably qualified, experienced and accredited marine archaeological consultant, and in accordance with the associated WSI (**Volume 2, Appendix 4.7.B, Written Scheme of Investigation**) and accompanying Method Statements;
- Alongside the additional pre-consent surveys planned during Summer 2023, any further marine geophysical or geotechnical surveys undertaken, for instance post-consent or post-construction, will be archaeologically assessed and interpreted by a suitably qualified, experienced and accredited marine archaeological geophysicist or geoarchaeologist. Work will be undertaken in accordance with the associated WSI (**Volume 2, Appendix 4.7.B, Written Scheme of Investigation**) and accompanying Method Statements. The results of such surveys will be integrated with previous interpretations and reported on accordingly to inform the EIA process. It is also recommended that archaeological specialists are included in the design of any geophysical and geotechnical surveys to ensure that opportunities are maximised where possible;
- Watching briefs will be utilised in the intertidal or marine areas where any intrusive works are planned. These could include pre-lay grapnel runs or intertidal cable-laying in an excavated trench. The proposed methodology will be presented in a Method Statement and agreed through consultation with the Regulator, the MMO, and the Archaeological Curator, Historic England, for marine works and the respective local authority curatorial bodies that serve Suffolk and Kent for works in the intertidal zone; and
- Once the design of the Offshore Scheme has been confirmed, it may be possible to ascertain measures to protect heritage assets that could be indirectly impacted, for instance by scouring, exposure or erosion, caused by direct impacts to the seabed. For instance, 'physical buffers' may be placed around a heritage asset to protect it from scour. This will be confirmed following review of the Physical Environment Chapter (**Volume 1, Part 4, Chapter 2, Physical Environment**) and recommendations made. The proposed methodology for such works will be



outlined in a Method Statement and approved by the Archaeological Curator, Historic England and the Regulator, the MMO.

- 4.7.8.5 The measures above will require archaeological Method Statements prepared by an archaeological consultant and approved by the Archaeological Curator and Regulator prior to the commencement of any works that could cause impact to marine or intertidal heritage receptors.

## 4.7.9 Preliminary Assessment of Effects

- 4.7.9.1 The preliminary assessment of the effects of the Offshore Scheme described in this section considers the embedded, control and management and mitigation measures described in section 4.7.8.
- 4.7.9.2 For the sensitivity test outlined in section 4.7.5, preliminary effects reported would not be any different if the works were to commence in any year up to year five.
- 4.7.9.3 Table 4.7.19 presents the preliminary assessment of marine archaeology effects.
- 4.7.9.4 The preliminary effects reported below are the same for the Proposed Project on its own, and the Proposed Project with co-location.

Table 4.7.19: Preliminary assessment of marine archaeology effects.

<b>Preliminary assessment</b>	
Receptor	Sub-seabed heritage receptors (known and potential palaeogeography and buried maritime and aviation features)
Potential Impact	<b>Physical disturbance activities causing direct damage and/or loss to the sub-seabed</b> caused by: Trenched marine cable installation for bundled (x2 HVDC cables) and one Fibre Optic cable in one trench (including cable lay and post lay burial, ploughs, jet trenching, mechanical trenching, MFE and CFE, and simultaneous cable lay and burial methods).
Proposed Project phase	Construction, maintenance and decommissioning
Duration	Duration of physical sub-seabed disturbance works
Mitigation	Embedded mitigation, MA01, MA02, MA03, MA04, MA05, MA06 and MA07
Preliminary sensitivity	Palaeogeography receptors – very high sensitivity (with value ranging from negligible to high). See section 4.7.6.5 for more details.  Buried maritime and aviation receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.16 for more details.
Preliminary magnitude	Large adverse
Preliminary likely significance of effect	<b>Not Significant</b> with mitigation in place

<b>Preliminary assessment</b>	
Confidence in prediction	High confidence due to the application of committed mitigation.
Receptor	Seabed heritage receptors (known and potential maritime and aviation features)
Potential Impact	<p><b>Physical disturbance activities causing direct damage and/or loss to the seabed</b> caused by:</p> <p>Pre-installation seabed/ground preparation (including pre-lay surveys, cable route clearance, pre-sweeping and UXO clearance);</p> <p>Trenched marine cable installation for bundled (x2 HVDC cables) and one Fibre Optic cable in one trench (including cable lay and post lay burial, ploughs, jet trenching, mechanical trenching, MFE and CFE, and simultaneous cable lay and burial methods);</p> <p>External cable protection (including rock placement, concrete mattresses, rock/gravel/sand/grout bags, protection sleeves/cast-iron shells); and</p> <p>Vessel activities (including cable lay vessel, cable burial vessel, guard vessels, support vessels, rock placement vessels that could all cause impact from anchors, and jack-up platforms).</p>
Proposed Project phase	Construction, maintenance and decommissioning
Duration	Duration of physical seabed disturbance works
Mitigation	Embedded mitigation, MA01, MA03, MA04, MA05, MA06 and MA07
Preliminary sensitivity	Seabed receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.16 for more details.
Preliminary magnitude	Large adverse
Preliminary likely significance of effect	<b>Not Significant</b> with mitigation in place
Confidence in prediction	High confidence due to the application of committed mitigation.
Receptor	Buried intertidal heritage receptors (known and potential palaeogeography, historic terrestrial, marine and aviation features)
Potential Impact	<p><b>Physical disturbance activities causing direct damage and/or loss</b> caused by:</p> <p>Trenchless cable installation activities (using HDD or Direct Pipe) in the intertidal zone at the marine entry point located approximately 5m Lowest Astronomical Tide (LAT), either totalling four HDDs or up to ten HDDs (that would incorporate other projects in addition to the Proposed Project). The cable will extend beneath the</p>

<b>Preliminary assessment</b>	
	intertidal zone to the transition joint bays (TJB) located beyond the MHWS level and therefore beyond the study area.
Proposed Project phase	Construction, maintenance and decommissioning
Duration	Duration of physical disturbance works in the intertidal zone
Mitigation	<p>Embedded mitigation, MA01, MA02, MA03, MA05 and MA07</p> <p>In addition to the mitigation measures that can be used to protect potential archaeological features, all known intertidal assets within the intertidal zone should be avoided using trenchless techniques. These will be used at both landfalls to install the cable ducts, passing below the beach deposits, and thereby avoiding impacts upon intertidal assets.</p>
Preliminary sensitivity	<p>Sub-seabed receptors – very high sensitivity (with value ranging from negligible to high). See section 4.7.6.5 for more details.</p> <p>Seabed receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.16 for more details.</p> <p>Intertidal receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.17 for more details.</p>
Preliminary magnitude	Large adverse
Preliminary likely significance of effect	<b>Not Significant</b> with mitigation in place
Confidence in prediction	High confidence due to the application of committed mitigation.
Receptor	Seabed heritage receptors (known and potential maritime and aviation features)
Potential impact	<b>Physical disturbance activities causing indirect changes to hydrodynamic and sedimentary regimes</b> leading to sediment reduction on the seabed and scour.
Proposed Project phase	Construction, maintenance, operation and decommissioning
Duration	Lifetime of the Offshore Scheme
Mitigation	MA01, MA03, MA04, MA05, MA06 and MA07
Preliminary sensitivity	Seabed receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.16 for more details.
Preliminary magnitude	Medium adverse

<b>Preliminary assessment</b>	
Preliminary likely significance of effect	<b>Not Significant</b> with mitigation in place
Confidence in prediction	High confidence due to the application of committed mitigation.
Receptor	Seabed heritage receptors (known and potential maritime and aviation features)
Potential impact	<b>Physical disturbance activities causing indirect changes to hydrodynamic and sedimentary regimes</b> leading to sediment accretion on the seabed.
Proposed Project phase	Construction, maintenance, operation and decommissioning
Duration	Lifetime of the Offshore Scheme
Mitigation	MA01, MA03, MA04, MA05, MA06 and MA07
Preliminary sensitivity	Seabed receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.16 for more details.
Preliminary magnitude	Medium beneficial since sediment covers archaeological material providing protection from erosion and exposure.
Preliminary likely significance of effect	<b>Not Significant</b> with mitigation in place
Confidence in prediction	High confidence due to the application of committed mitigation.
Receptor	Sub-seabed heritage receptors (known and potential palaeogeography and buried maritime and aviation features). Seabed heritage receptors (known and potential maritime and aviation features). Intertidal heritage receptors (known and potential palaeogeography, historic terrestrial, marine and aviation features).
Potential impact	<b>Project works that temporarily or permanently change the setting of a heritage receptor</b>
Proposed Project phase	Construction, maintenance, operation and decommissioning
Duration	Duration of Offshore Scheme although the impact may be less severe during the operation and maintenance phases when duration is shorter and temporary
Mitigation	Embedded mitigation, MA01, MA02, MA04, MA06 and MA07
Preliminary sensitivity	Sub-seabed receptors – very high sensitivity (with value ranging from negligible to high). See section 4.7.6.5 for more details.

<b>Preliminary assessment</b>	
	Seabed receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.16 for more details. Intertidal receptors – very high sensitivity (with value ranging from negligible to high). See Table 4.7.17 for more details.
Preliminary magnitude	Small adverse
Preliminary likely significance of effect	<b>Not Significant</b> with mitigation in place
Confidence in prediction	High confidence due to the application of committed mitigation
Receptor	Historic seascape character of the region
Potential impact	<b>Project works that temporarily or permanently change the character of the historic seascape</b>
Proposed Project phase	Construction, maintenance, operation and decommissioning
Duration	Duration of the Offshore Scheme
Mitigation	No mitigation recommended
Preliminary sensitivity	Medium-low sensitivity (with a medium value). See section 4.7.6.37-38 for more details.
Preliminary magnitude	Small adverse
Preliminary likely significance of effect	<b>Not Significant</b>
Confidence in prediction	High confidence due to the application of committed mitigation and a complete baseline to inform the prediction.

## 4.7.10 Transboundary Effects

- 4.7.10.1 A transboundary effect is any significant adverse effect on the environment resulting from human activity, the physical origin of which is situated wholly or in part within an area under the jurisdiction of another State.
- 4.7.10.2 All works associated with the Proposed Project fall within the UK jurisdiction (12 NM). Given the distance of the Proposed Project from French waters (approximately 25 km), no significant transboundary effects have been identified. Predicted disturbance from the Proposed Project is short term and local and are therefore not anticipated to be sufficient to influence marine archaeological receptors outside UK waters, and subsequently cause transboundary effects.
- 4.7.10.3 Furthermore, the PEIR has concluded no significant effects for marine archaeological receptors in UK waters.

## 4.7.11 Summary

- 4.7.11.1 The themes relevant to the marine archaeological baseline assessed in this chapter relate to known and potential sites of palaeogeography, seabed features including maritime and aviation sites, intertidal features relating to marine activity, and the historic seascape character in and around the Offshore Scheme. The known and potential archaeological resources have been summarised in this chapter and assessed for their sensitivity, and in particular their archaeological value/importance.
- 4.7.11.2 Mitigation measures, in the form of embedded mitigation, control and management measures and additional mitigation measures, have been recommended to manage potential impacts caused by the Proposed Project that could affect the archaeological resource (4.7.8). With the implementation of the mitigation measures outlined, the preliminary likely significance of effect on the receptors are all considered to be not significant. Therefore, effects on archaeological receptors should be reduced to a manageable and workable level for the adequate protection of the marine archaeological resource, to not be significantly impacted by the Proposed Project.

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