XLINKS MOROCCO-UK POWER PROJECT

Preliminary Environmental Information Report

Volume 3, Chapter 7: Marine Archaeology and Cultural Heritage

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Glossary

Term	Definition
Terminology Relating to the Proposed Development	
BP	An archaeological dating convention (“before present”)– the present assumed in this report to be 1950 (i.e. based on uncalibrated radiocarbon dates).
EEA	European Economic Area
HER	Historic Environment Record
Intertidal area	The area between Mean High Water Springs and Mean Low Water Springs.
Landfall	The proposed area in which the offshore cables make landfall in the United Kingdom (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Cornborough Range, Devon, between Mean Low Water Springs and the Transition Joint Bay inclusive of all construction works, including the offshore and onshore cable routes, and landfall compound(s).
Maritime archaeology	Maritime archaeology, in its most basic form, is the study of material culture related to human interaction with the sea. It involves the study of ships and shipwrecks, maritime infrastructure, heritage exploitation, maritime identities and landscapes, seascapes, and other types of heritage, both tangible and intangible.
Offshore Cable Corridor	The proposed corridor within which the offshore cables are proposed to be located, which is situated within the United Kingdom Exclusive Economic Zone.
Offshore Cables	The cables, situated within the UK Exclusive Economic Zone, would bring electricity from its generation source to the landfall.
Offshore Infrastructure Area	The area within the Proposed Development Order Limits up to Mean Low Water Springs within which the offshore infrastructure are proposed to be located.
Proposed Development	The element of the Xlinks Morocco-UK Power Project within the UK, which includes the offshore cables (from the UK Exclusive Economic Zone to landfall), landfall site, onshore Direct Current and Alternating Current cables, converter stations, road upgrade works and, based on current assumptions, the Alverdiscott Substation Connection Development.
Study area	This is an area which is defined for each environmental topic which includes the Proposed Development Draft Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Survey area	The area within which each survey has been undertaken. This may differ from the study area as a survey area will be based on species or survey-specific guidance on the extent of survey required, which may be limited by, for example, habitat conditions, or be defined in terms of buffer areas around an area of potential impact.
Xlinks Morocco UK Power Project (the ’Project’)	This relates to the overall scheme from Morocco to the United Kingdom's national grid, including all onshore and offshore elements of the transmission network (referred to as the ’Project’)

Acronyms

Acronym	Meaning
AC	Alternating Current
ADS	Archaeological Data Service

Acronym	Meaning
AEZ	Archaeological Exclusion Zones
AONB	Area of Outstanding Natural Beauty
BEIS	The former Department for Business, Energy & Industrial Strategy
BGS	British Geological Survey
CCC	Climate Change Committee
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CIfA	Chartered Institute for Archaeology
CITiZAN	Coastal and Intertidal Zone Archaeological Network
COP	Conference of the Parties
COWRIE	Collaborative Offshore Wind Research Into the Environment
DC	Direct Current
DCO	Development Consent Order
DHER	Devon Historic Environment Record
DEFRA	Department for Environment, Food & Rural Affairs
DESNZ	The Department for Energy Security and Net Zero
EEA	European Economic Area
EEZ	Exclusive Economic Zone
ES	Environmental Statement
EIA	Environmental Impact Assessment
EU	European Union
FTE	Full Time Equivalent
GB	Great Britain
GHI	Global Horizontal Irradiance
GIS	Geospatial Information Systems
GHG	Greenhouse Gas
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
JNAPC	Joint Nautical Archaeology Policy Committee
LGM	Last Glacial Maximum
LNR	Local Nature Reserve
MBES	Multibeam Echosounder
MCZs	Marine Conservation Zones
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MPS	Marine Policy Statement
NHLE	National Heritage List of England
NHSC	National Historic Seascape Characterisation
NMHR	National Marine Heritage Record

Acronym	Meaning
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OS	Ordnance Survey
PAD	Protocol for Archaeological Discoveries
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PINS	The Planning Inspectorate
SAC	Special Area of Conservation
SBP	Sub-bottom Profiler
SPAs	Special Protection Areas
SSS	Side Scan Sonar
SSSI	Site of Special Scientific Interest
UCH	Underwater Cultural Heritage
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation

Units

Units	Meaning
nm	Nautical mile
km	Kilometre
m	metre

7 MARINE ARCHAEOLOGY AND CULTURAL HERITAGE

7.1 Introduction

7.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary findings of the Environmental Impact Assessment (EIA) work undertaken to date for the United Kingdom (UK) elements of the Xlinks Morocco-UK Power Project. For ease of reference, the UK elements of the Xlinks Morocco-UK Power Project are referred to in this chapter as the 'Proposed Development'.

7.1.2 The marine historic environment (archaeology and cultural heritage) comprises potential submerged prehistoric landscapes, archaeological remains of watercraft, aircraft crash sites and structural remains other than watercraft. This includes designated Heritage Assets and assets identified by the local planning authority (including local listing), which are protected by law or local policy.

7.1.3 The terms 'archaeology' and 'cultural heritage' are, in general, perceived as interchangeable. Strictly, though, 'archaeology' refers to the process of obtaining information from the material culture of past societies. For the purposes of this document, 'archaeology' refers to cultural heritage that has the potential to provide information about the past through scientific and academic research, whereas 'cultural heritage' refers more broadly to all aspects of the material and intangible culture of past societies. The term 'underwater cultural heritage' (UCH) refers to cultural heritage within or on the seabed or within estuaries, rivers, lakes and other bodies of water.

7.1.4 This chapter (and its associated figures and appendices) is intended to be read as part of the wider PEIR, with particular reference to Volume 1, Chapter 3: Project Description, Volume 3, Chapter 8: Physical Processes, Volume 4, Chapter 2: Landscape, Seascape and Visual Resources and Volume 2, Chapter 2: Historic Environment.

7.1.5 The PEIR will inform pre-application consultation. Following consultation, comments on the PEIR and any refinements in design will be reviewed and taken into account, where appropriate, in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate for development consent.

7.2 Legislative and Policy Context

Legislation

7.2.1 The Proposed Development is located within the UK EEZ, and the Offshore Cable Corridor extends through the English Territorial Sea (up to 12 nautical miles) from the coast into the UK EEZ. The following legislation applies to archaeology and cultural heritage within both the UK Territorial Sea and the UK EEZ:

- Protection of Wrecks Act 1973: Sections One and Two;
- The Marine and Coastal Access Act (2009);

- Ancient Monuments and Archaeological Areas Act 1979 (as amended);
- Protection of Military Remains Act 1986; and
- Merchant Shipping Act 1995.

7.2.2 The above legislation provides protection for wrecks of high historical, archaeological or artistic value, as well as allowing military wrecks and aircraft remains to be protected. There are currently no known protected wrecks within the study area (**section 7.4**). If encountered, all military aircraft crash sites are automatically protected under the Protection of Military Remains Act 1986. Ownership of any wreck remains is determined in accordance with the Merchant Shipping Act 1995.

7.2.3 In 2000, the UK government ratified The European Convention on the Protection of the Archaeological Heritage (Revised) 1992 (The Valletta Convention). The convention binds the UK to implement protective measures for the archaeological heritage within their jurisdiction, including sea areas.

7.2.4 The UNESCO Convention on the Protection of Underwater Cultural Heritage, adopted in 2001, is intended to enable States to better protect their submerged cultural heritage. The UK was one of a number of States that abstained from the 2001 vote and has not ratified the Convention. However, the UK has adopted 'The Rules', an Annex to the Convention that sets out a standard for archaeological investigations, as government policy for underwater cultural heritage.

Planning Policy Context

7.2.5 The Proposed Development will be located within UK inshore waters and the UK EEZ offshore waters - beyond 12 nautical miles (nm) from the English coast (with the onshore infrastructure located wholly within Devon, England). As set out in Volume 1, Chapter 1: Introduction of the PEIR, the Secretary of State for the Department for Energy Security and Net Zero (DESNZ) has directed that elements of the Proposed Development are to be treated as development for which development consent is required under the Planning Act 2008, as amended.

National Policy Statements

7.2.6 There are currently six energy National Policy Statements (NPSs), three of which contain policy relevant to the Proposed Development, specifically:

- Overarching NPS for Energy (NPS EN-1) which sets out the UK Government's policy for the delivery of major energy infrastructure (Department for Energy Security & Net Zero 2023a);
- NPS for Renewable Energy Infrastructure (NPS EN-3) (Department for Energy Security & Net Zero 2023b); and
- NPS for Electricity Networks Infrastructure (NPS EN-5) (Department for Energy Security & Net Zero 2023c).

7.2.7 **Table 7.1** sets out key archaeology and cultural heritage aspects from the NPSs relevant to the Proposed Development, with particular reference to the need for, and approach to, consenting such infrastructure.

Table 7.1: Summary of relevant NPS policy

Summary of NPS requirement	How and where considered in the PEIR
NPS EN-1	
Paragraph 5.9.9: "The applicant should undertake an assessment of any likely significant heritage impacts of the proposed development as part of the EIA and describe these along with how the mitigation hierarchy has been applied in the ES. This should include consideration of heritage assets above, at, and below the surface of the ground. Consideration will also need to be given to the possible impacts, including cumulative, on the wider historic environment. The assessment should include reference to any historic landscape or seascape character assessment and associated studies as a means of assessing impacts relevant to the proposed project."	The significance of the archaeological receptors considered in this chapter, and the contribution of setting to that significance, have been detailed in **sections 7.5-7.14**. Issues relating to the setting of onshore heritage assets have been considered as part of Volume 2, Chapter 2 of this PEIR: Historic Environment.
Paragraph 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 asset, accurate representative visualisations may be necessary to explain the impact."	**Section 7.5** of this chapter provides a full assessment of the baseline environment.
Paragraph 5.9.12: "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. Studies will be required on those heritage assets affected by noise, vibration, light and indirect impacts, the extent and detail of these studies will be proportionate to the significance of the heritage asset affected."	This chapter provides an account of the potential impacts of the Proposed Development on heritage assets and their significance (**sections 7.7-7.14**).
NPS EN-3	
Paragraph 2.8.77: "To inform micrositing/microrouting applicants should undertake high-resolution survey work and make provision for investigative work, such as archaeological examination, to assess the impacts of any proposed cables or foundation placement on potential heritage assets."	The assessment has been undertaken in accordance with section 2.8 of EN-3. The geophysical survey data will be reviewed and analysed by a suitable archaeological contractor and the results will be published in the ES chapter.
Paragraph 2.8.78: "Applicants should submit an outline archaeological Written Scheme of Investigation (WSI) as part of the DCO submission, with a commitment to complete a project specific WSI post-consent in consultation with Historic England."	A project-specific Offshore Outline Archaeological WSI will be submitted as part of the DCO submission package, with a draft Offshore Outline Archaeological WSI appended to this PEIR chapter (**paragraph 7.15.1**).
Paragraph 2.8.168: "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 pre-application, taking into	A summary of consultation undertaken to date with Historic England is included in **Table 7.6.** Consultation will be ongoing throughout the development process.

Summary of NPS requirement	How and where considered in the PEIR
account any applicable guidance (e.g., offshore renewables protocol for archaeological discoveries."	
Paragraph 2.8.173: "Applicants are required to determine how any known heritage assets might best be avoided."	This PEIR chapter and the subsequent ES chapter provide an account of how the known heritage assets should be avoided (**Table 7.16**).
Paragraph 2.8.175: "Once a site has been chosen, it may be necessary to undertake further archaeological assessment, including field evaluation investigations prior to construction, to understand a known site's significance and full extent, and, to identify as yet unknown heritage assets when considering the options for detailed site development, in accordance with an archaeological written scheme of investigation included with the application."	Areas for further investigation will be identified in the subsequent ES chapter.
Paragraphs 2.8.252 - 2.8.255: "The avoidance of important heritage assets to ensure their protection in situ, is 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. 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."	The avoidance of heritage assets is mentioned in **section 7.7** of the PEIR chapter and will be detailed in the subsequent ES chapter.
Paragraph 2.8.325: "The Secretary of State should be satisfied that any proposed offshore wind farm and/ or offshore transmission project has appropriately considered and mitigated for any impacts to the historic environment, including both known heritage assets, and discoveries that may be made during the course of development."	This PEIR chapter considers the potential impacts on the known and hitherto unknown maritime heritage assets and makes appropriate recommendations to mitigate any adverse impact on them.
Paragraphs 2.10.137- 2.10.138: "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. Where requested by the applicant, the Secretary of State should consider granting consents which allow for the micrositing within a specified tolerance of elements of the permitted infrastructure so that precise locations can be amended during the construction phase if unforeseen circumstances, such as the discovery of previously unknown archaeology, arise."	The heritage assets will be avoided by means of microrouting during detailed project design and during installation, where applicable. The 500 m (minimum) Offshore Cable Corridor provides flexibility for microrouting.
NPS EN-5	
Paragraph 2.2.10: "…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	Potential impacts upon sites and objects of offshore archaeological and heritage interest are set out in **sections 7.8-7.14** along with a proposed approach to mitigation.

Summary of NPS requirement	How and where considered in the PEIR
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."	

The National Planning Policy Framework

7.2.8 The National Planning Policy Framework (NPPF) was published in 2012 and updated in 2018, 2019, 2021 and 2023 (Department for Levelling Up, Housing and Communities, 2023). The NPPF sets out the Government's planning policies for England. This assessment has been undertaken in a manner consistent with the National Planning Policy Framework (NPPF).

7.2.9 Provision for the historic environment is principally given in section 16: 'Conserving and enhancing the historic environment' of the NPPF, which directs local authorities to 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". Local planning authorities should recognise that heritage assets are "an irreplaceable resource and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations" (DLUHS, 2023).

7.2.10 The aim of NPPF section 16 is to ensure that local planning authorities, developers and owners of heritage assets adopt a consistent and holistic approach to their conservation and to reduce complexity in planning policy relating to proposals that affect them.

7.2.11 **Table 7.2** sets out a summary of the NPPF policies relevant to this chapter.

Table 7.2: Summary of NPPF requirements relevant to this chapter

Policy	Key provisions	How and where considered in the PEIR
16 (Paragraph 195)	Recognises that heritage assets are an irreplaceable resource.	The PEIR chapter recognises this and sets out the proposed approach to mitigation in **section 7.8**.
16 (Paragraph 200)	Requires applicants to provide a level of detail that is proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance.	**Section 7.5** provides an assessment of the baseline environment and the significance of the archaeological receptors is detailed in **sections 7.9-7.14**.
16 (Paragraph 203)	Takes into account the desirability of sustaining and enhancing the significance of heritage assets, including any contribution made by their setting, and putting them to viable uses consistent with their conservation.	The significance of the archaeological receptors and the contribution of setting to that significance have been detailed in **sections 7.9-7.14**.

Policy	Key provisions	How and where considered in the PEIR
16 (Paragraphs 205-208)	Places weight on the conservation of designated heritage assets (which include world heritage sites, scheduled monuments, listed buildings, protected wreck sites, registered parks and gardens, registered battlefields or conservation areas), with any anticipated substantial harm weighed against the public benefits of the proposal.	**Section 7.5** provides an assessment of the baseline environment and **section 7.8** sets out the proposed approach to mitigation.
16 (Paragraph 209)	Requires applicants to include a consideration of the effect of an application on the significance of non-designated heritage assets, giving regard to the scale of any harm or loss and the significance of the heritage asset.	**Sections 7.9-7.11** provide an assessment of the effect of the Proposed Development on non-designated heritage assets.
16 (Paragraph 211)	Requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible.	**Section 7.8** sets out the proposed approach to mitigation and a project-specific Offshore Outline Archaeological WSI will be submitted as part of the DCO submission package as well (c.f. Appendix Volume 3, Appendix 7.2 of this PEIR).
16 (Paragraph 212)	Regards proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) favourably.	**Sections 7.9-7.11** provide an assessment of the setting of heritage assets and set out the proposed approach to mitigation.

7.2.12 The Planning Practice Guidance (PPG) (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2019) supports the NPPF and provides guidance across a range of topic areas. The PPG includes further information and guidance on how national planning policy is to be interpreted and applied locally. Although the PPG is an important and relevant consideration with respect to the Proposed Development, EN-1 (the Overarching NPS for Energy) is the key decision-making document.

Marine Policy

UK Marine Policy Statement

7.2.13 This assessment also takes account of the UK Marine Policy Statement (MPS) (DEFRA, 2020). The MPS sets out high-level objectives for marine planning, which have directed development of the plan at a local level. Marine Plans must be in accordance with other relevant national policy and are intended to contribute to the achievement of sustainable development in the UK marine area. Of relevance to the Proposed Development is the South West Inshore and South West Offshore Marine Plan (DEFRA, 2021) ('South West Marine Plan').

South West Inshore and South West Offshore Marine Plan

7.2.14 The South West Marine Plan has been prepared to address Section 51 of the Marine and Coastal Access Act 2009, which states “a marine plan authority may prepare a marine plan for an area consisting of the whole or any part of its marine planning region” to include “the authority's policies for and in connection with the sustainable development of the area”, and has been agreed and adopted by the Secretary of State for Environment, Food and Rural Affairs. The South West Marine Plan covers the footprint of the Proposed Development and the associated marine archaeology and cultural heritage study area.

7.2.15 **Table 7.3** sets out a summary of the specific policies set out in the South West Inshore and South West Offshore Marine Plans (DEFRA, 2021) relevant to this chapter.

Table 7.3: Summary of inshore and offshore marine plan policies relevant to this chapter

Policy	Key provisions	How and where considered in the PEIR
SW-HER-1	Proposals that may affect heritage assets should demonstrate, in order of preference: a) avoid b) minimise c) mitigate - any harm to the significance of heritage assets. If it is not possible to mitigate, then public benefits for proceeding with the proposal must outweigh the harm to the significance of heritage assets.	**Section 7.5** provides an overview of the heritage assets that may be affected by the Proposed Development and **section 7.8** sets out the proposed approach to mitigate the potential impacts.

Local Planning Policy

7.2.16 The policy context for the Proposed Development is set out in Chapter 2: Policy and legislation context. The onshore elements of the Proposed Development are located within the administrative area of Torridge District Council. The relevant local planning policies applicable to Onshore Cultural Heritage and Archaeology are summarised in Volume 2, Chapter 2 of this PEIR.

North Devon Biosphere Reserve

7.2.17 The Proposed Development is located within the North Devon Biosphere Reserve, which is recognised under UNESCO's Man and the Biosphere (MAB) Programme and designated as an area for testing and demonstrating sustainable development on a sub-regional scale.

7.2.18 The North Devon Biosphere Reserve consists of three zones; a core zone centred around Braunton Burrows SAC / SSSI, a buffer zone consisting of the Taw Torridge Estuary (as far as Barnstaple and Bideford), and a transition zone formed by the catchment area of the rivers and streams that drain to the North Coast of Devon in addition to an area of sea as far out as Lundy.

7.2.19 The Biosphere Reserve is overseen by the North Devon Biosphere Reserve Partnership, which is a collaboration of 26 partnership organisations who work to deliver sustainable development through direct action, through advocacy and providing advice. The non-statutory 'North Devon Biosphere Reserve Strategy for Sustainable Development 2014 to 2024' (NDB undated) provides a context for stakeholders to deliver programmes and plans in support of the sustainable development of the Biosphere Reserve.

7.2.20 Within the North Devon Biosphere Reserve, non-statutory programmes and plans relevant to marine archaeology and cultural heritage include:

- BioCultural Heritage Tourism Project - to increase the economic value of tourism based on their natural and cultural resources, whilst reducing its environmental impact
- North Devon Marine Natural Capital Plan

7.2.21 The extent to which the Proposed Development impacts on the North Devon Biosphere Reserve and its relevant programmes / plans has been considered in this marine archaeology and cultural heritage chapter, and consultation will take place with the North Devon Biosphere Reserve Partnership ahead of ES stage to further characterise any potential impacts. **Table 7.4** presents a summary of the specific policies set out in the North Devon Marine Natural Capital plan (North Devon UNESCO Biosphere Reserve, 2020) and the Strategy for Sustainable Development (NDB undated) relevant to this chapter.

Table 7.4: Summary of North Devon Biosphere Marine Natural Capital Plan and Strategy for Sustainable Development policies relevant to this chapter

Policy	Description	How and where considered in the PEIR
Marine Natural Capital Plan PL01: *Novel and ongoing monitoring of the marine environment should incorporate local knowledge to identify where there may be potential for research and data gathering, and promote partnership working between regulators, academics and local stakeholders.*	*A key function of the Biosphere Reserve is to research, monitor and disseminate the learning from our approaches to sustainable development. In addition, there is a rich heritage of marine and maritime sectors in north Devon with a variety of stakeholder groups. PL01 recognises the value of collaboration with local users of the marine environment to gather novel anecdotal evidence, and to deliver bespoke, locally led approaches to sustainable governance. Furthermore, PL01 highlights that the natural capital assets*	As outlined in **Table 7.16**, relevant results from geotechnical surveys will be shared with the Archaeological Data Service (ADS), with the aim to enhance the palaeogeographic knowledge and understanding of the area. Similarly, relevant results from geotechnical surveys can also be shared with the North Devon Biosphere Reserve Partnership.

Policy	Description	How and where considered in the PEIR
	in MNCP area deliver benefits from multiple ecosystem services and will require multi-agency, cross-jurisdiction working to ensure effective, site level management approaches to underpin flows of ecosystem services benefits.	
Strategy for Sustainable Development SOC5	*Promote the conservation and enhancement of cultural assets and sites and the public participation in their management*	Proactive management of Marine Archaeology and Cultural Heritage throughout the project is part of the embedded mitigation strategy, which is set out in Table 7.16. The Draft Offshore Outline Archaeological WSI (Volume 3, Appendix 7.2) contains further information on the enhancement of cultural heritage assets (recording, reporting, archiving and dissemination of the data).

7.3 Consultation and Engagement

7.3.1 In January 2024, the Applicant submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects for the construction and operational phases of the Proposed Development. It also described those topics or sub-topics which are proposed to be scoped out of the EIA process and provided justification as to why the Proposed Development would not have the potential to give rise to significant environmental effects in these areas.

7.3.2 Following consultation with the appropriate statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on 07 March 2024. Key issues raised during the scoping process specific to marine archaeology and cultural heritage are listed in **Table 7.5**, together with details of how these issues have been addressed within the PEIR.

Table 7.5: Summary of Scoping Responses

Comment	How and where considered in the PEIR
Planning Inspectorate	
It is noted that the Scoping Report includes consideration of potential transboundary effects in relation to the following aspects: • Benthic Ecology; • Fish and Shellfish Ecology; • Commercial Fisheries; • Marine Mammals and Sea Turtles; • Offshore Ornithology; • Other Marine Users; • Marine Archaeology and Cultural Heritage; • Physical Processes;	Transboundary effects are considered within the PEIR in **section 7.12**.

Comment	How and where considered in the PEIR
• Underwater Noise; and • Climate Change. The Inspectorate also notes reference to potential positive impacts on other EEA States at paragraphs 9.4.37 to 9.4.38 in respect of Socio-economic effects but these are proposed to be scoped out on the basis that they are positive. The Inspectorate recommends that the ES should identify whether the Proposed Development has the potential for significant transboundary effects, and if so, what these are, and which EEA States would be affected. The Inspectorate will undertake a transboundary screening on behalf of the SoS in due course.	
Change in hydrodynamic regime (scour and accretion) during construction, operational repair and decommissioning (if the cable is removed) The Scoping Report states that changes could occur from presence of rock berms, which may be required for cable protection at crossings or in isolated hard seabed areas during operation. The Inspectorate notes the predicted construction timetable and two offshore cable laying phases as described at Paragraphs 4.7.10 to 4.7.12 of the Scoping Report. It appears possible that rock berms would be in place for extended periods of construction activity in advance of the cable becoming operational and that mitigation may also be required during this period. The Inspectorate advises that the potential for change to the hydrodynamic regime due to the presence of cable protection should be assessed for the phases during which it is likely to give rise to significant effects and that the ES should describe any mitigation required and explain how this would be secured in the DCO.	Concerns have been noted. Changes to the hydrodynamic regime during the construction phase is scoped in to the assessment and is considered in the PEIR (see **section 7.8**) and will be considered in the ES chapter as part of Impact 4. Mitigation measures adopted as part of the Proposed Development are outlined in **Table 7.16**
Habitat alteration and change in hydrodynamic regime in the construction and both decommissioning phases (ie in situ and removal) The Inspectorate is content for the effect of the introduction of hard substrate to be considered during operational phase and therefore agrees this matter can be scoped out of the construction stage assessment. The ES should however consider the removal of subsequent hard substate in the decommissioning (removal) phase, where likely significant effects could occur, or provide evidence demonstrating agreement with the relevant consultation bodies that significant effects are not likely to occur.	The impact of potential removal of the cable and any of its protections (e.g. rock berm) has been scoped into the assessment and is considered in the PEIR (see **section 7.8**) and will be considered in the ES chapter as part of Impacts 10 and 11.
Direct impacts to cultural heritage assets within the footprint of the Proposed	The scoped out elements have been summarised in **Table 7.9**.

Comment	How and where considered in the PEIR
Development during operation (excluding repair) and decommissioning (in-situ) The Inspectorate notes that no justification is presented in the Scoping Report to scope this matter out from these stages of the Proposed Development. However, it considers that a pathway for effect is unlikely to arise during operation (excluding repair) and decommissioning (in situ) given the limited activities involved. The Inspectorate agrees that this matter can be scoped out of the assessment.	
Direct and indirect impacts as a result of geo-morphological changes during decommissioning (in situ) The Inspectorate notes that no justification is presented in the Scoping Report to scope this matter out from the decommissioning (in situ) option. Where the offshore cable is proposed to remain in situ there could be future effects with geomorphological changes, akin to potential effects by remaining in-situ during operation. It is not clear why this matter is not required to be scoped in and therefore the Inspectorate cannot agree to scope this matter out at this stage. The ES should include an assessment of this matter, where likely significant effects could occur, or evidence to support that significant effects are not likely.	Indirect physical impacts from geomorphological changes during decommissioning (*in-situ*) have been reconsidered and scoped into the assessment. This impact has been considered in the PEIR (see **section 7.8**) and will be considered in the ES chapter as part of Impact 9.
Potential effects to the setting of onshore cultural heritage assets – all phases The Inspectorate is content to scope out this matter as all onshore cultural heritage assets are located away from the marine environment, therefore any activity is unlikely to impact the setting of any onshore assets.	The scoped out elements have been summarised in **Table 7.9**.
Potential effects arising from the decommissioning of the Proposed Development The general approach and justification to scoping out the decommissioning phase is described in Table 8.8.3; however, it is not confirmed whether this relates to decommissioning (in situ) or decommissioning (removal). It is however assumed it relates to decommissioning (in situ) as Table 8.8.2 confirms that decommissioning (removal) would be assessed in the ES. As such, the Inspectorate agrees that this matter can be scoped out.	The scoping for aspects of the decommissioning phase has been clarified in **Table 7.8** and **Table 7.9**.
Heritage Assets The Inspectorate considers that the Hartland Heritage Coast should be included on Figure 8.8.1, which shows other heritage assets in the vicinity of the Proposed Development.	The Heritage Coasts that lay within the boundary of the study area have been added to the figure and are considered within the assessment (c.f. paragraph 7.5.5 of this PEIR chapter).
Mitigation measures	Proposed mitigation measures are outlined in **Table 7.16** and the results of archaeological review of the geophysical and geotechnical surveys undertaken in

Comment	How and where considered in the PEIR
The ES should clearly identify the proposed mitigation measures to be included in respect of marine archaeology. A WSI should steer the final design of the offshore cable and appropriate mechanisms should be clearly laid out to deal with any finds during implementation. Mitigation measures including any Archaeological Exclusions Zones (AEZs) should be clearly identified and the distance justified accordingly. The ES should also explain how the WSI, including any AEZs, are to be appropriately secured and effort made to agree the WSI with consultation bodies.	2023 will allow for a detailed targeted mitigation strategy to be identified for the ES chapter. A Draft Offshore Outline Archaeological WSI (Volume 3, Appendix 7.2) accompanies the PEIR and will be updated in line with the results of the survey reviews for the ES.
Assessment criteria Tables 8.8.4 and 8.8.5 describe how the value/sensitivity and magnitude of change is defined; however, there is no explanatory text to confirm where this has been derived from. The ES should include information regarding any guidance used to inform the assessment criteria.	The guidance used to inform the value/sensitivity definitions is described in **paragraph 7.4.15** in the PEIR. The guidance used to inform the magnitude of change definitions is described in **paragraph 7.4.20** in the PEIR.
Potential inter-related effects The Scoping Report states that data gathered for the onshore archaeological and cultural heritage assessment will be reviewed as part of the marine archaeology assessment. Consideration should be given to including onshore archaeology and cultural heritage aspect chapter within an inter-related effects section, should it be appropriate following consultation feedback and further design work.	Onshore archaeology and cultural heritage data will be reviewed to provide context for the potential marine archaeology and cultural heritage assets. The onshore cultural heritage chapter will be considered within the inter-related effects section.
The Scoping Report states that the construction phase would not be lengthy enough for significant climate change risks to occur compared to the present-day baseline. The Applicant states that they would employ good health and safety practices with respect to risks such as heatstroke or storm events offshore. A construction programme of approximately up to 84 months (7 years) is estimated at Paragraph 4.2.98 of the Scoping Report. The Inspectorate disagrees that during this period of construction the impacts from climate change would not lead to a significant effect, as this does not take into account extreme weather events both onshore and offshore or impacts to human receptors (eg construction workers). The ES should assess impacts from climate change, including extreme weather events over the construction and decommissioning periods, where significant effects are likely to occur and describe and secure any relevant mitigation measures.	The effects of climate change on the future archaeological baseline are most likely to have greatest influence on coastal waters (<20 m); further details are provided in the 'Future Baseline Conditions' section of this chapter. The current baseline marine archaeology characterisation (noting that additional survey data processing is underway and will be presented at ES stage) is deemed appropriate against which to assess construction, operational, and decommissioning phase impacts on cultural heritage features. Further details are provided in the 'Future Baseline Conditions' section of this chapter, and also within Volume 3, Technical appendices 7.1 and 7.2.
The Inspectorate notes the references in the Scoping Report to professional guidance (ie 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (Institute of	Noted.

Comment	How and where considered in the PEIR
Environmental Management and Assessment (IEMA) 2022)) and IEMA's 'Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (IEMA, 2020). The ES should set out the methodologies used to explain any departure from the proposed approach where professional judgement is applied. Outputs from other assessments should be clearly explained where these have been applied.	
Where significance criteria are not explicitly defined within the guidance, the ES should clearly set out where deviation from guidance has occurred and professional judgement has been applied.	Noted.
The Scoping Report states that potential impacts on material assets arising from the Proposed Development will be considered in the other marine users, historic environment, land use and recreation; and socio-economics aspect chapters of the ES and a standalone material assets aspect chapter is not proposed. The Inspectorate agrees with the proposed approach on this basis.	Noted.
Historic England	
At present we consider that the impacts included within table 8.8.2 present a good starting point in which to inform any subsequent EIA. Additionally, that the impacts scoped in or out are acceptable. However, as explained within the Historic England guidance document The Setting of Heritage Assets (Good Planning Advice in Planning 3), impacts to the setting and the significance of heritage assets such as scheduled monuments or Protected Wreck Sites - that are periodically, partly or wholly submerged - are equally applicable in some rare cases. Which in respect to the project's development infrastructure may present such instances where the extent of cable burial is not altogether possible.	The known protected wrecks and scheduled monuments within the marine or intertidal environment within the study area are identified in the baseline in **Table 7.14** and considered within the PEIR assessment (**section 7.8**) and will be considered within the ES.
Regarding only the archaeological science elements of the proposed offshore works, consideration of the potential impact of geomorphological changes is welcomed, as is the assessment of potential impacts through physical process modelling.	Sections **7.8, 7.9, and 7.10** set out the PEIR assessments of these elements with regards marine archaeology. Cross reference also the Physical Processes PEIR chapter Volume 3, Chapter 8, and Volume 3, Technical Appendix 8.1: High Level Assessment of Sediment Dispersion.
The Scoping report explains in summary (within table 8.8.1 and 8.8.27) the EIA's marine archaeology and cultural heritage assessment will be informed by the interpretation of the geophysical and geotechnical survey data. Principally through Multibeam Bathymetry, Sidescan Sonar, Magnetometer and Sub-bottom Profiling geophysical techniques. With reference to up to date standards and guidance included. Whilst we welcome this approach, to support a	Any insufficient data in the geophysical and geotechnical surveys will be identified and recommendations will be made where warranted to ensure that potential remains and associated impacts are accurately identified, characterised, and mitigated. A draft offshore outline archaeological WSI is provided at PEIR stage (Volume 3, Appendix 7.2) which will be refined for the ES.

Comment	How and where considered in the PEIR
clear characterisation level of seabed impacts, if this data is to be solely used for the purposes of the final route design, it runs the risk of being insufficient to inform a more iterative approach to gathering important information about impacts to the historic environment. Therefore, the PEIR archaeological assessment technical reports included at the stage of the pre-application should be given the complete autonomy to issue recommendations as to where such acquired data is insufficient, lacking in resolution or demonstrating gaps in coverage. Such that plans for schemes of further work can be effectively captured within supporting documentation attached to any consent granted. I.e. through an Outline Offshore Written Scheme of Investigation (WSI).	
We note and welcome the alluded to known and recorded nature of maritime and aviation related archaeology within the study area. Such as paragraph 8.8.15. However, we feel the potential for unrecorded sites in or close to the development area is very high. The justification for this uncertainty is given the marine historic environment comprises more than those sites that are currently recorded with in accessible marine datasets. As an example, the seabed around Cornwall contains approximately 4,500 shipwrecks, of which 85% are unaccounted for wrecked, foundered and stranded vessels. Therefore, it is quite possible should th is project progress to consent and construction, such sites may well be encountered, and requiring an effective management response. Furthermore, below the seabed surface important evidence of prehistoric landscapes and associated artefacts dating to past human activity may also exist, yet to be mapped and yet to be understood and shared with the wider community.	The potential for marine archaeological remains is reported at the end of each proposed development phase summary within **section 7.5** in the PEIR. This will be detailed in the desk-based assessment to appended to the ES chapter.
We note that as a form of 'embedded mitigation' the "micro-routing of the cable corridor will be undertaken where possible and archaeological exclusion zones applied to avoid direct impacts on cultural heritage assets and submerged land surfaces beneath marine sediments where possible". As such, there are some points the Environmental Statement (ES) should look to consider in further detail on this provision. The first being that, as illustrated in figures 8.6.2: 'Navigational features and 8.7.4: 'Subsea cables', there is a high level of seabed coverage in or close to the proposed route already being utilised. As a result, affording effective micro-routing may require careful planning, with survey data and	Noted. The extent of archaeological exclusion zones will be conservatively determined where uncertainty exists by experienced marine archaeologists. This will be reported in the ES chapter and will be used to inform the mitigation strategy. Micro-routing of the route will take into account any areas of constriction and the mitigation strategy in those areas will be carefully designed to minimise impact to the assets.

Comment	How and where considered in the PEIR
other strategies of investigation important in identifying any constrictive area issues early on. Secondly, whilst in many cases the use of a full suite of high-resolution geophysical survey methods can provide confidence as to the extent of an archaeological exclusion zone. There are always some instances where, due to a range of factors (e.g. wrecking process or subsequent clearance activities) where the full extent of a wreck sites remains uncertain. With some outlying geophysical anomalies, which may seem less significant, in fact on closer inspection forming part of a broader wreck assemblage. It is therefore through the referenced (forthcoming) ES and supporting WSI, that mechanisms for targeting and adapting to these cases should be coherently considered.	
A draft Offshore Outline Archaeological WSI should be included at the PEIR stage. Thereby providing a systematic link with the impacts identified, with the description of resulting measures of evaluation and mitigation (or offsetting) through targeted schemes of investigation, set out clearly (and in good time) between any potential consent and seabed preparations. Specifically, these schemes of investigation will need to evaluate and further characterise features of the known or unknown historic environment - through ground truthing surveys - that may present a potential seabed constraint. Which we wholly recommend utilise onboard archaeological expertise during such surveys, to maximise the information outputs.	A draft Offshore Outline Archaeological WSI has been included (Volume 3, Appendix 7.2) and will be refined for the ES following the completion of the baseline, archaeological review of the geophysical data, and any further geoarchaeological reviews of the geotechnical data (c.f. Volume 3 Appendix 7.1).
In doing so we feel this will align closely with the stated policy provisions of EN-1, paragraph 5.9.13 whereby the "applicant is encouraged, where opportunities exist, to prepare proposals which can make a positive contribution to the historic environment". And paragraph 5.9.19 "Where there is a high probability (based on an adequate assessment) that a development site may include, as yet undiscovered heritage assets with archaeological interest, the Secretary of State will consider requirements to ensure appropriate procedures are in place for the identification and treatment of such assets . .. ".	The stage 1 geoarchaeological review of the geotechnical borehole logs forms Appendix 7.1 of this PEIR (Volume 3, Appendix 7.1). The review includes recommendations for further investigation where necessary and further mitigation activities. A draft Offshore Outline Archaeological WSI has been completed and is appended to the PEIR in draft form (Volume 3, Appendix 7.2); this contains further information on the planned investigations.
This we feel also fits closely to the EN-3 provision we would like to see considered appropriately in an ES assessment, to "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" - paragraph 3.8.191.	
To do this we request that input of archaeological expertise (to accredited standards and utilising a	

Comment	How and where considered in the PEIR
range of appropriate specialists where necessary), to maximise design and survey planning opportunities, needs to be fully confirmed throughout the ES and Offshore Outline Archaeological WSI.	
Specifically, as noted above, an experienced offshore/onshore geoarchaeologist is necessary to fully assess the submerged prehistoric potential, based upon a comprehensive ground model (of sub-surface deposits).	
In order to consider the potential impact on the geoarchaeological and palaeoenvironmental significance of deposits, the heritage assessment should include a detailed geoarchaeological and palaeoenvironmental desk based assessment which considers recent palaeoenvironmental studies with in the Taw Torridge estuary, this should be supported by a review of current, previous and any intended geotechnical assessment or targeted geoarchaeological boreholes. With clear reference to applicable Historic England guidance.	
With respect to measures to mitigate impacts to known and potential archaeological features and deposits within the intertidal, nearshore and punch-out area onshore, a full strategy to assess and survey this area needs to be discussed and agreed upon with Historic England and the Local Authority ahead of any PEIR submission.	Consultations are on-going and discussions include a survey and assessment strategy (see **Table 7.6**).

7.3.3 Following scoping, consultation and engagement with interested parties specific to marine archaeology and cultural heritage has continued. Two meetings with Historic England, as the archaeological advisors to the Planning Inspectorate, have been undertaken to date.

7.3.4 A summary of the key issues raised during consultation activities undertaken to date is presented in **Table 7.6**, together with how these issues have been considered in the production of this PEIR chapter.

Table 7.6: Summary of consultation relevant to this chapter

Date	Consultee and type of meeting	Issues raised	How and where considered in the PEIR
12 December 2023	Project Introduction Meeting with Historic England and the project team	Consenting overview, project introduction, route review, data gathering, methodology, and Historic England's expectations.	As per project description (Volume 1 of this PEIR) and methods discussions (**section 7.4**).
25 January 2024	Progress update meeting	White Cross windfarm – both developers to share spatial scheme data and work collaboratively.	Cumulative projects considered in **section 7.10.** Further geo-archaeological investigation will be considered as part of additional mitigation.

Date	Consultee and type of meeting	Issues raised	How and where considered in the PEIR
		Locations of geotech cores to be shared with Historic England. Historic England encouraged by gap between consenting and construction, which would allow time to be able to address (plan or mitigate) any significant archaeological remains prior to works commencing.	
17 April 2024	Progress update meeting	Geophysical and geotechnical surveys were discussed. Expectation of acquisition of more detailed UXO level survey to support construction. The 'sea bed features assessment' and the 'geoarchaeology assessment' will be provided for the purposes of the ES.	A draft Offshore Outline Archaeological WSI has been included (Volume 3, Appendix 7.2) and will be refined for the ES following the completion of the baseline, archaeological review of the geophysical data, and any further geoarchaeological reviews of the geotechnical data (c.f. Volume 3 Appendix 7.1). The stage 1 geoarchaeological review of the geotechnical borehole logs forms Appendix 7.1 of this PEIR (Volume 3, Appendix 7.1).

7.4 Methodology

Relevant Guidance

7.4.1 In demonstrating adherence to industry good practice, this chapter has been compiled in accordance with the following relevant standards and guidance shown below in **Table 7.7**.

Table 7.7: Guidance relevant to the Marine Archaeology and Cultural Heritage assessment

Relevant Guidance	Relevance to assessment
Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007)	Guidance on survey, appraisal and monitoring of the historic environment for renewables projects
Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (Oxford Archaeology, 2008)	Guidance on the assessment of cumulative impacts on the historic environment for renewables projects
Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee and The Crown Estate, 2006)	The aim of the Code is to ensure a best practice model for seabed development. The Code offers guidance to developers on issues such as risk management and legislative implications
Guidance for Offshore Geotechnical Investigations and Historic Environment Analysis: guidance for the renewable energy sector (COWRIE, 2011)	Guidance on how best to achieve the integration of offshore geotechnical investigations and their data outputs, arising from offshore renewable energy projects, with archaeological historic environment analysis, and ensure optimum use of geotechnical data
Assessing Boats and Ships 1860-1913, 1914-1938 and 1939-1950. Archaeological Desk-Based Assessments in 3 volumes (Wessex Archaeology, 2011)	Guidance to assess the significance of shipwrecks from the 19th and 20th centuries.
Protocol for Archaeological Discoveries: Offshore Renewables Projects (The Crown Estate, 2014)	Outlines a general protocol to be implemented for archaeological discoveries offshore. This is general best practice and will be used to inform the result of mitigation.
The Chartered Institute for Archaeologists (CifA) Codes, Standards and Guidance CifA, 2020a; CifA, 2020b; CifA, 2020c; CifA, 2022)	Range of documents to provide guidance, regulations and standards to use to ensure high ethical and professional standards, such as: Standards and guidance for desk-based assessment (CifA, 2020b); Standards and guidance for commissioning work on, or providing consultancy advice concerning archaeology and the historic environment (CifA, 2020b).
Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects, (The Crown Estate, 2021)	Guidance on the range of archaeological methodologies that may be required as part of the initial investigation stages or the mitigation phase of offshore projects.
People and the Sea: a maritime archaeological research agenda for England (Ransley et al., 2013	An overview of the research questions that inform archaeological investigation within UK territorial waters

Scope of the Assessment

7.4.2 The scope of this PEIR has been developed via the EIA scoping process and in consultation with relevant statutory and non-statutory consultees as detailed in **Table 7.6**.

7.4.3 **Table 7.8** summarises the issues considered as part of this assessment.

Table 7.8: Issues considered within this assessment

Activity	Potential effects scoped into the assessment
Construction Phase	
Direct disturbance of features	Impact 1: Direct impact of sediment removal containing undisturbed archaeological contexts during seabed preparation ahead of construction activities leading to the total or partial loss of marine heritage receptors.
	Impact 2: Direct impact by penetration, compression and disturbance during seabed preparation, laying of cables and laying of rock berm over cable crossings leading to the total or partial loss of marine heritage receptors.
	Impact 3: Direct impact by penetration, compression and disturbance effects of jack-up barges and anchoring of construction vessels during construction activities leading to total or partial loss of marine heritage receptors.
Indirect disturbance of features	Impact 4: Indirect impacts upon known and potential marine archaeological receptors as a result of changes to sedimentation and erosion patterns.
	Impact 5: Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities.
Operational phase	
Direct disturbance of features (Operational – repair)	Impact 6: Direct impact by penetration, compression and disturbance effects during repair activities at the cable corridor leading to further degradation of marine heritage receptors.
	Impact 7: Direct impact by penetration, compression and disturbance effects of jack-up barges and anchoring of maintenance vessels during the operational phase leading to further degradation of marine heritage receptors.
Indirect disturbance of features (Operational-repair and Operational-normal)	Impact 8: Indirect impacts causing disturbance of sediment containing potential marine heritage receptors during maintenance activities (Operational-repair), or from alteration of local currents resulting in scour (Operational-normal) leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.
Decommissioning phase	
Indirect impact of assets (*in-situ*)	Impact 9: Indirect impacts causing disturbance of sediment containing potential marine heritage receptors from leaving the cable and cable protection infrastructure *in-situ* leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.
Direct impact to asset (removal of cable)	Impact 10: Direct impacts by penetration, compression and disturbance through removal activities and the anchoring of vessels during the

Activity	Potential effects scoped into the assessment
	decommissioning phase leading to further degradation of marine heritage receptors.
Indirect impact of assets (removal of cable)	Impact 11: Indirect impacts causing disturbance of sediment containing potential marine heritage receptors from removal of the cable and cable protection infrastructure leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.

7.4.4 Effects which are not considered likely to be significant have been scoped out of the assessment. A summary of the effects scoped out is presented in **Table 7.9**.

Table 7.9: Issues scoped out of the assessment

Activity	Potential effects scoped out of the assessment
Construction Phase	
Setting of onshore features	No intervisibility between the offshore cable corridor and the onshore cultural features is anticipated given the nature of the environment and distance of the onshore cultural heritage assets from the offshore development activity. Potential effects to the setting of onshore cultural heritage assets arising from the visibility of offshore infrastructure during construction of the Project have been scoped out of further assessment.
Operation and Maintenance	
Setting of onshore features	No intervisibility between the offshore cable corridor and the onshore cultural features is anticipated given the nature of the environment and distance of the onshore cultural heritage assets from the offshore development activity. Potential effects to the setting of onshore cultural heritage assets arising from the visibility of offshore maintenance vessels during operation and maintenance of the Project would be short term and temporary and would not constitute a significant change within the setting of the asset and impact how the asset is understood or experienced within its setting and further assessment of these impacts has been scoped out.
Direct impact to features	Normal operation of the cables would not be expected to introduce any additional direct impacts to marine archaeology or cultural heritage features and therefore it is considered there would be no change to the importance of the asset. For this reason, further assessment of this impact has been scoped out.
Decommissioning: *in-situ*	
Direct impact of assets (*in-situ*)	It is anticipated that there will be no direct impacts during decommissioning phase of the development if the cable is de-energised and left *in-situ*. As such, potential direct effects arising from the decommissioning of the Project have been scoped out from further assessment. (Note, indirect disturbance from potential scour is assessed as Impact 9).

Study Area

7.4.5 A marine archaeology study area has been established for the purposes of collating and characterising baseline data as part of this PEIR (Volume 3, Figure 7.1, sheets 1-5). The study area encompasses the Offshore Cable Corridor from Mean High Water Springs (MHWS) to the UK Exclusive Economic Zone

(EEZ) boundary, as well as a 5 km buffer. All receptors landwards of MHWS will be included within Volume 2, Chapter 2: Historic Environment.

7.4.6 The extended marine archaeology study area (5 km buffer) is industry standard and allows for the consideration of direct and indirect effects on marine archaeological and cultural heritage receptors and is designed to accommodate the potential imprecision of historic marine positioning.

7.4.7 The study area will be reviewed and amended for the final ES in response to such matters as refinement of the offshore components, the identification of additional impact pathways and in response where appropriate to feedback from stakeholder engagement and statutory consultation. In addition, data gathered for the onshore assessment will be reviewed to identify whether there is relevant contextual data that could inform the marine archaeology assessment.

7.4.8 There is an intertidal overlap between the onshore and offshore archaeology study areas to ensure that there is total coverage of the PEIR study areas between the two chapters.

Methodology for Baseline Studies

Desk Studies

7.4.9 Information on marine archaeology and cultural heritage assets within the study area was collected through a detailed review of existing studies and datasets. These sources are summarised at **Table 7.13**.

Site-Specific Surveys

7.4.10 The marine geophysical survey data were acquired by GEOxyz in 2023 comprising sub-bottom profiler (SBP), sidescan sonar (SSS), magnetometer (Mag) and multibeam echosounder (MBES) data. Data were acquired on board the survey vessel Geo Ocean VI.

7.4.11 Analysis of the relevant raw data from a marine archaeology and cultural heritage perspective is ongoing and data will be provided to Wessex Archaeology for specialist processing and interpretation. The analysed marine geophysical survey data will be included within the final marine archaeology and cultural heritage ES chapter.

Impact Assessment Methodology

Overview

7.4.12 The impact assessment methodology adopted for marine archaeology and cultural heritage will define heritage assets, and their settings, likely to be impacted by the proposed development and assess the level of any resulting beneficial or adverse impact regarding their significance. The assessment is not limited to direct (physical) impacts, but also assesses possible indirect (physical) impacts upon heritage assets which may arise as a result of changes to hydrodynamic and sedimentary processes and changes to the setting of heritage assets, whether visually, or in the form of noise, dust and vibration, spatial

associations and a consideration of historic relationships between places which may impact their significance.

7.4.13 Loss or disturbance of known and unknown heritage assets, palaeoenvironmental deposits and historic landscapes will be considered qualitatively in line with the principles set out in the relevant marine archaeology and cultural heritage legislation (**section 7.2**). The impact assessment criteria are informed by the guidance, regulations and standards set out in **Table 7.7**.

7.4.14 The approach to determining the significance of effects is a two-stage process that involves defining the magnitude of the impact and the sensitivity of the receptor. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors.

Receptor Importance

7.4.15 It is normal practice within impact assessment for the historic environment topic to describe receptor 'Importance', in preference to value or sensitivity. The NPPF defines importance of a receptor or sensitivity as "The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting". The determination of the importance is based on statutory designation and/or professional judgement against these values (they are also identified in Historic England Conservation Principles revised consultation draft and Historic England Statements of Heritage Significance).

7.4.16 For the purposes of this assessment, the criteria for determining the heritage importance of any relevant heritage assets are described in **Table 7.10**.

7.4.17 The categories and definitions of heritage importance do not necessarily reflect a definitive level of importance of an asset. They are intended to provide a provisional guide to the assessment of perceived heritage importance, which is ultimately based upon professional judgement that incorporates the evidential, archaeological, historical, aesthetic, architectural and communal heritage values of the asset or assets. It is important to note that the importance and cultural significance of an asset can be amended or revised as more information comes to light (i.e. as part of further investigations planned pre-ES, or post-consent).

7.4.18 **Table 7.10** includes heritage assets of uncertain heritage importance i.e. where the importance, existence and / or level of survival of an asset has not been ascertained (or fully understood) from available evidence. Although **Table 7.10** provides a definition for assets of an uncertain heritage importance, where uncertainty occurs, the precautionary approach is to assign the highest likely level of importance. This precautionary approach represents good practice in cultural heritage impact assessment and reduces the potential for impacts to be underestimated. At PEIR stage where there is current uncertainty regarding e.g. the baseline characterisation of heritage assets this may result in a precautionary increase in the Importance rating assigned. Further investigation of the geophysical survey data are planned prior to ES submission, which will reduce uncertainties.

7.4.19 The criteria for defining importance in this chapter are outlined in **Table 7.10** below.

Table 7.10: Importance (Sensitivity) criteria

Importance / Sensitivity	Definition
Very High	This category contains heritage assets that will be considered to be of international importance either for historic associations or their informative potential. This category includes World Heritage Sites (including nominated sites) and assets of acknowledged international importance.
High	This category contains heritage assets that will be considered to be of national importance either for historic associations or their informative potential. This category includes heritage assets designated as scheduled monuments, protected military remains, protected wrecks and those heritage assets of scheduled quality and importance. Also includes palaeoenvironment remains that are either very well-preserved or particularly important for understanding specific periods.
Medium	Heritage assets of regional importance for historic associations or their informative potential. This category includes well-preserved live wrecks that are not suitable for designation, or palaeoenvironmental remains that are typical of a region.
Low	Non-designated heritage assets of local importance for historic associations or their informative potential may include marine debris or less well-preserved marine material, or generally representative archaeological material or feature types.
Negligible	These include those features that are recorded but no longer extant, which are suggestive of further activity but not of intrinsic value (e.g. records of losses without identified wreck sites, some 'dead' wrecks, isolated finds of debris).
Uncertain	Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow significance to be determined

Magnitude of Change

7.4.20 Magnitude broadly equates as the degree to which heritage interest may be positively or negatively changed by an individual impact as discussed in the Historic England Conservation Principles, Policies and Guidance (Historic England 2008).

7.4.21 Direct physical impacts, indirect physical impacts and impacts from a change in setting that may affect heritage assets are considered relevant. Impacts may be adverse or beneficial. Depending on the nature and duration of the potential effect, impacts can also be temporary and / or reversible or permanent and / or irreversible.

7.4.22 The finite nature of archaeological remains means that physical impacts are almost always permanent and irreversible as the 'fabric' of the asset and, hence, its potential to inform our historical understanding, will be removed. By contrast, impacts resulting from the change in the setting of heritage assets will depend upon the longevity of construction and operation of the proposed development and the sensitivity with which the seascape is re-instated where applicable.

7.4.23 The magnitude of adverse impact with respect to offshore archaeology and cultural heritage directly relates to the extent of harm to, or loss of, key elements of the asset's cultural significance, which may include its setting.

7.4.24 The magnitude of beneficial impact with respect to offshore archaeology and cultural heritage directly relates to the level of public benefit associated with an

individual impact. Benefits may correspond directly to the Proposed Development itself where a project will enhance the historic environment (e.g. through measures which will improve the setting of a heritage asset or public access to it).

7.4.25 Alternatively, benefits may occur on the basis of data gathering exercises undertaken for the purpose of a project which will enhance public understanding by adding to the archaeological record (e.g. through the accumulation of publicly available information and data). The measure of beneficial impact (high / medium / low) is, therefore, necessarily situational and specific to a given site, area or subject. One such example of a positive magnitude of impact could be relevant to, for example, new survey data being acquired, which will ultimately be made publicly accessible.

7.4.26 The criteria for defining magnitude in this chapter are outlined in **Table 7.11** below.

Table 7.11: Definition of magnitude criteria for Marine Archaeology and Cultural Heritage

Magnitude of impact		Definition
High	Adverse	Total or substantial change to an asset. Loss or disturbance of defining features of the asset. Comprehensive changes to setting such as extreme visual effects, gross change of noise or change to sound quality, or fundamental changes to use or access.
	Beneficial	Preservation of a heritage asset *in situ* where it would otherwise be completely or almost lost. Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated, and experienced.
Medium	Adverse	Changes to many key archaeological materials or elements, such that the cultural significance of the heritage asset is clearly modified. Changes that negatively affect the way in which the heritage asset is understood, appreciated, and experienced.
	Beneficial	Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored. Changes that improve the way in which the heritage asset is understood, appreciated, and experienced.
Low	Adverse	Slight changes to key archaeological materials or elements, such that the cultural significance of the heritage asset is slightly altered. Changes that result in a slight decline in the way a heritage asset is understood, appreciated, and experienced.
	Beneficial	Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
Negligible	Adverse	Changes to archaeological materials or historic buildings elements such that alterations to the cultural significance of the heritage asset are very minor. Very minor changes to setting such as virtually unchanged visual effects, or very slight changes to use or access.
	Beneficial	Very minor changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Very minor changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.

Magnitude of impact		Definition
No Change	N/A	Changes to fabric or setting that leave cultural significance unchanged.

Significance of Effect

7.4.27 The significance of the effect upon Marine Archaeology has been determined by taking into account the importance of the receptor and the magnitude of the impact. The method employed for this assessment is presented in **Table 7.12**. Where a range of significance levels is presented, the final assessment for each effect is based upon expert judgement. Broad definitions of each level of significance are provided below.

7.4.28 In all cases, the evaluation of receptor importance, impact magnitude and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.

7.4.29 For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 7.12: Assessment Matrix

Importance of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
Very High	Major	Major	Major or Moderate	Minor
High	Major	Major or Moderate	Moderate or Minor	Minor
Medium	Major or Moderate	Moderate	Minor	Minor or Negligible
Low	Minor	Minor	Minor or Negligible	Minor or Negligible
Negligible	Minor	Minor or Negligible	Minor or Negligible	Negligible

7.4.30 Where the magnitude of impact is ‘no change’, no effect would arise.

7.4.31 Broad definitions for significance of effect levels are described as follows:

- **Major**: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process. For the historic environment, in terms of the NPPF, this equates to substantial harm to, or loss of, an asset of very high, high, or medium heritage importance, as a result of changes to its physical form or setting.
- **Moderate**: These beneficial or adverse effects have the potential to be important and may influence the key decision-making process. For the historic environment, this equates to less than substantial harm to an asset of very high, high, or medium heritage importance, as a result of changes to its physical form or setting.
- **Minor**: These beneficial or adverse effects are generally, but not exclusively, raised as local factors. For the historic environment, this equates to less than substantial harm to an asset of very high, high, or medium heritage importance, because of changes to its physical form or setting, or substantial harm to, or the loss of, an asset of low heritage importance.
- **Negligible**: No effects or those that are beneath levels of perception as a result of the Proposed Development, within normal bounds of variation or within the margin of forecasting error.

- **No change**: No loss or alteration of characteristics, features or elements; no observable impact in either direction.

7.4.32 Effects that are classified as moderate or above are considered to be ‘significant’ in EIA terms. Effects classified as minor or below are considered to be ‘not significant’. The language used in the NPPF (for example, substantial or less than substantial harm) has been correlated with the standard EIA methodology. A significant effect (major or moderate effect significance) equates to 'substantial harm', and non-significant effects (minor or less effect significance) are considered 'less than substantial harm'.

Assumptions and Limitations of the Assessment

7.4.33 The assessment is based on the current design information provided in Volume 1, Chapter 3 of this PEIR: Project Description. The design of the Proposed Development will continue to be reviewed and assessed in advance of the DCO Application submission.

7.4.34 The records held by the United Kingdom Hydrographic Office (UKHO), Historic England (National Heritage List for England (NHLE) and maritime records), Devon Historic Environment Record (DHER), and Coastal and Intertidal Zone Archaeological Network (CITiZAN) 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.

7.4.35 Due to the nature of marine archaeological remains, their identification and assessment necessarily requires an element of assumption. The nature, extent, survival, and even the precise location, of marine heritage asset remains are often uncertain, as many sites have not been subject to archaeological investigation to modern standards. Assessment of the value of such sites (as part of the assessment process) is often, therefore, heavily reliant on informed extrapolation from limited data, comparison with similar assets in similar contexts and, ultimately, on professional judgment.

7.4.36 In addition, the relevant raw marine geophysical survey data have not been assessed fully in the context of marine archaeology and cultural heritage, and therefore have not informed this PEIR chapter. These geophysical data will be provided to Wessex Archaeology for detailed processing and interpretation, and will be individually assessed for quality and their suitability for archaeological purposes. The analysed marine geophysical survey data will be included within the relevant ES chapter.

7.5 Baseline Environment

7.5.1 A summary of the Marine Archaeology and Cultural Heritage baseline environment is provided in the following sections.

Desk Study

7.5.2 Information on Marine Archaeology and Cultural Heritage within the study area was collected through a detailed review of existing studies and datasets. These are summarised at **Table 7.13**.

Table 7.13: Summary of desk study sources used

Source	Summary
UKHO records	Records of wrecks and obstructions data including 'dead' and salvaged wrecks that are no longer charted as navigational hazards.
Maritime records maintained by Historic England	Maritime records, including documented losses of vessels, and records of terrestrial monuments and findspots, including the archaeological excavation index.
National Heritage List of England (NHLE)	Records of designated heritage assets within England, maintained by Historic England. Geospatial Information Systems (GIS) data for all Protected Wrecks, Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Registered Battlefields.
Devon Historic Environment Record (DHER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources.
British Geological Survey (BGS)	Historic borehole logs and the wider geological background for the region.
Coastal and Intertidal Zone Archaeological Network (CITiZAN)	Interactive mapping of intertidal heritage in England.
Existing archaeological studies and published sources	Background information on the archaeology of the Celtic Sea and the Atlantic Ocean, including recent work undertaken in the wider Atlantic Ocean area. Background information relating to submerged landscapes within the Celtic Sea and the Bristol Channel.

Identification of designated sites

7.5.3 There are four Scheduled Monuments within the study area that are protected under the Ancient Monuments and Archaeological Areas Act 1979.

7.5.4 All designated sites within the study area that could be affected by the construction, operation and maintenance phases of the Proposed Development are set out in **Table 7.14** and are shown on Volume 3, Figure 7.1 and Volume 3, Figure 7.2 of this PEIR.

Table 7.14: Designated sites and relevant qualifying interests

Designated Site	Distance to the Proposed Development Site	Relevant Qualifying Interest
Wreck at Westward Ho! (NHLE 1432418)	2.5 km	Scheduled Monument
Wreck off Northam Burrows (NHLE 1432949)	2.7 km	Scheduled Monument
HMS *Montagu* (ex-Montague) (NHLE 1440450)	4.5 km	Scheduled Monument
Montagu Steps (NHLE 1461607)	4.8 km	Scheduled Monument

Identification of non-designated sites

Overview of known non-designated assets

7.5.5 The north end of the OCC extends into the Hartland Heritage Coast. The study area also extends into the Lundy Heritage Coast. Heritage Coasts are areas of coastline defined by Natural England for their natural beauty, terrestrial, coastal and marine flora and fauna, and their heritage features. The heritage features of the two Heritage Coasts located within the study area are included within the non-designated heritage assets listed below and are considered individually throughout the baseline and assessment sections. The natural environment aspects of the Heritage Coasts, namely the undeveloped natural beauty and the terrestrial, coastal and marine flora and fauna, are considered in the corresponding chapters of this PEIR. The terrestrial heritage features are described and assessed as part of Volume 2, Chapter 2 of this PEIR: Historic Environment.

7.5.6 There are 298 recorded non-designated heritage assets recorded by the UKHO, DHER, HE and CITiZAN databases within the study area (see Volume 3, Figure 7.1 of this PEIR), including seven within the Offshore Cable Corridor (OCC) boundary itself, all of which are unspecified obstructions or foul ground (UKHO Wreck ID 16050, 16874, 16967, 17275, 12202, 12198, and 62763).

7.5.7 Within the study area, there are 25 DHER records relating to wrecks (MDV108384, MDV112345, MDV43297, MDV53576, MDV57572, MDV57573, MDV57574, MDV57575, MDV57576, MDV57578, MDV57924, MDV57925, MDV57936, MDV57937, MDV57938, MDV57940, MDV57955, MDV58099, MDV58175, MDV58176, MDV58177, MDV58179, MDV58198, MDV63743, MDV63744) and 224 wrecks and obstructions recorded by UKHO. The UKHO records comprise 138 unspecified obstructions or foul ground, 54 unidentified wrecks, an aircraft wreck, and 31 named wrecks (Volume 3, Figure 7.1 of this PEIR). These records largely date between the 18th and 21st centuries, with some dating earlier.

7.5.8 Other than wreck sites, the HER and CITiZAN databases hold records related to the following:

- Palaeolandscape features and sub-seabed deposits of palaeoenvironmental interest (MDV107325, MDV107372, MDV107374, MDV107375, MDV107427, MDV107428, MDV107429, MDV107430, MDV107431, MDV107433, MDV107434, MDV107435, MDV44568, MDV50845, MDV63742, MDV53224, MDV71573, MDV71574, MDV71575, MDV102445 and CITiZAN ID 72731, 73148, 73148);
- Prehistoric occupation sites and midden deposits (MDV107373, MDV107377, MDV14854, MDV44569, MDV44570, MDV44571, MDV468, MDV70164, and CITiZAN ID 73021, 74283);
- Aviation remains (MDV102477);
- World War 2 (WWII) defence remains (MDV50849 and CITiZAN ID 69099); and
- Occupation activity related to all periods of human activity within the intertidal zone (MDV19484, MDV45996, MDV107314, MDV125638, MDV125645, and CITiZAN ID 73592, 74278, 74309, 75303, 84767, 84768).

Historical and Archaeological Background

Prehistoric (970,000 BC –43 AD)

7.5.9 The Lower (800,000–250,000 BC) and Middle (250,000–40,000 BC) Palaeolithic saw intermittent, perhaps seasonal Hominin occupation of Britain as the climate alternated between long cold (glacial) and short warm (interglacial) stages. The glacial cycles resulted in periods of lower and higher sea-level compared to modern levels. The site and study area have been shaped by three major glaciations over the past 970,000 years which each led to lower sea levels and, periods when the general area was partially exposed as land suitable for hominin occupation (Wenban-Smith, 2002). The sea level is hypothesised at least 120 m lower than today in this area of the Celtic Sea after the Last Glacial Maximum (LGM); therefore, the coastline would have been located further west than its current location until inundation around the end of the Mesolithic period. This would have been limited to the north of the study area within the Celtic Sea near the Bristol Channel. The terrestrial landscape would have included the existing Isle of Lundy located to the north of the OCC. These periods of intermittent colonisation are associated with the retreat of icesheets following the last three glacial maximums:

- Anglian: Lower Palaeolithic c. 350 – 280,000 BCE (glacial maximum);
- Wolstonian: Lower Palaeolithic c. 250 – 150,000 BCE (glacial maximum); and
- Devensian: Upper Palaeolithic c. 100 – 22,000 BCE (glacial maximum).

7.5.10 The West Coast Palaeolandscapes Survey mapped sections of the Celtic Sea and all of the Bristol Channel revealing floodplains, series of lakes, river channels and seabed features (Fitch and Gaffney, 2011). Fragmented submerged areas with occasional finds, such as flints, were identified along the North Devon coastline, including submerged forests at Northam Beach (MDV107325) 3.4 km to the north east of the landfall end of the OCC, and at Westward Ho! (MDV44568 and MDV107374) 2.2 km and 2.3 km to the north east of the OCC respectively. Areas of sandwaves, megaripples and Quaternary deposits were observed in the area of the identified palaeolandscapes and would protect any underlying

deposits, in combination with relatively low tidal stresses (Fitch and Gaffney, 2011).

7.5.11 The Upper Palaeolithic is the last of the Old Stone Age periods (40,000–10,000 BC), spanning the last glacial cycle of the Pleistocene (the British Devensian). The archaeology of the Upper Palaeolithic is characterised by new stone-working techniques, the use of bone and other materials, art and anatomically modern humans (*Homo sapiens sapiens*). After the last glacial maximum (c. 20,000 BC), the Devensian ended with the improved climatic conditions of the Holocene (c. 10,000 BC), and the environment changed from steppe-tundra to birch and pine woodland. Evidence suggests that the Bristol Channel valley, located to the north east of the study area, was largely open tundra with lakes, rivers, grasses and shrubs that would have supported animal life and in turn early humans during the Late Upper Palaeolithic until c. 12,500 BCE. It is likely that the area of the study area that would have been terrestrial at this point would have also been comprised of a similar landscape.

7.5.12 By the Mesolithic period (10,000–4000 BC), the Bristol Channel changed drastically, with sea level rise causing the coastline to retreat further inland. The isle of Lundy remained connected to the mainland at the beginning of the Mesolithic period. The rate of sea-level change had slowed considerably by c. 6,000 BCE creating a similar coastline to the modern day. Evidence of occupation and resource exploitation is found within the study area in the Mesolithic midden deposits (MDV14854, MDV107377) and late Mesolithic flint tools (MDV468) recorded on the DHER at Westward Ho! beach, 2 km north east of the OCC.

7.5.13 By the Neolithic period (4000–2200 BC), sea-level was near modern levels and the coastline has retreated to near its historic position, leaving the Isle of Lundy isolated. The coastline begins to be impacted by coastal change processes including erosion and deposition. Bideford Bay, in which the north end of the OCC is located, appears to have been sheltered from this period as organic deposits containing peats dated to the Neolithic are recorded within the DHER and CITiZAN datasets c. 2.6 km north east of the OCC (MDV107375, MDV107427, MDV107428, MDV107429, MDV107431, MDV107433, MDV107434, MDV53224, MDV63742, MDV71573, MDV71574, MDV71575, MDV102445, and CITiZAN ID 73366, 73430, 74186, 74220, 74099 and 75307). The creation of these deposits suggests that the interface between Bideford Bay and the estuary of the Rivers Torridge and Taw included marshland. Evidence of occupation and use of the marshland during this period is limited to finds of flint tools (MDV104112, MDV11722, MDV43860) 1.4 to 2.5 km from the north end of the OCC.

7.5.14 Although boat building is known within Britain during the Neolithic and Early Bronze Age periods, the known remains suggest that technology was limited to logboats and sewn-plank boats that are generally restricted to coastal or riverine environments. This limit is likely to be the result of survivor bias as the only boats found have been within riverine or marshy coastal environments. Sewn-plank construction techniques can be used to construct seaworthy vessels but no examples of seagoing vessels dated to the Neolithic have been identified within the British Isles to date. Evidence of occupation and activity is present on the Isle of Lundy, c. 5 km north of the OCC, which would have been isolated within the Celtic Sea following the sea level change by this period. The evidence includes a chambered tomb (NHLE1015931, MDV7112) and two standing stones (NHLE 1018266, MDV45993; NHLE 1015929) on the southern cliffs of the island. This

activity suggests the possibility that maritime activity was utilised during this period to facilitate or supplement the island activities.

7.5.15 During the Bronze Age (2200–800 BC), shipbuilding technology continued to advance allowing for a broadening of trade links. Evidence throughout Britain suggests that the population was trading with people in Ireland and potentially the European mainland. The routes taken are unknown but are likely to have included the study area. Within the vicinity of the OCC and the study area, the Isles of Scilly, located 51 km to the south east of the closest point of the OCC at the southern end, and the Isle of Lundy contain evidence of Bronze Age activities suggesting that they were accessible. Settlement activity was found as well as changes in the pollen profile detected, indicating that people from the mainland have accessed these islands (Ransley *et al*., 2013). Bronze Age occupation is further evidenced from the study area by seven beaker type sherds that were found on the foreshore in Bideford Bay (MDV70164), 2.3 km to the north east of the OCC.

7.5.16 Although no evidence dated to the Iron Age (800 BC–AD 43) has been identified within the study area, it is considered likely that activity continued within Bideford Bay and on the Isles of Scilly and the Isle of Lundy. Seafaring activity continued through the period and likely would have included the area of the OCC as routes to the estuaries of the Taw, Torridge and Severn rivers.

7.5.17 There is high potential for further evidence of prehistoric landscapes and remains dating from the Palaeolithic and Mesolithic periods. There is moderate potential for prehistoric remains following the rising of the sea levels in the Neolithic, these remains would include evidence of maritime activity including near shore resource exploitation, trade, and travel as well as further peat deposits which suggest a changing landscape that included a marshy intertidal. Prehistoric remains could be of up to high importance based on archaeological and historic interest. The importance of the receptors would be dependent on the type, survival and extent of the remains identified.

Roman (AD 43–410)

7.5.18 During the Roman period, there is historic evidence for seaborne and coastal activity along the English coastline; however, there is limited known physical evidence within the archaeological record for coastal sites and maritime activity. Indirect evidence within the archaeological record includes the proliferation of manufactured goods like Samian pottery, olive oil, and wine from mainland Europe and raw materials including copper, lead, and tin from Cornwall and Devon in use within Imperial Roman sites in mainland Europe and other regions within the British Isles suggest that regional trade links were well established during this period (Walsh *et al.* 2013). Manufactured goods and raw materials would have been transported from the Devon and Cornish coasts to settlements within the British Isles and to the European mainland.

7.5.19 Known trade routes in the Roman period have emphasis on cabotage or coastal tramping in which a ship calls at a series of ports along a route on the coast conducting mercantile activity along the way (Walsh *et al.* 2013, 107). It is likely that the study area would have been included within the known sea routes along the western coast of Britain utilised when travelling to important settlements including Brean Down, Sea Mills, Cardiff, and Caerwent on the Severn Estuary and Chester on the Dee Estuary. Bideford Bay is one of the only natural harbours within this region of the south west coast of Britain and would have acted as an

important anchorage particularly given the exposed cliffs along the Hartland coast to the south west and to the north east to Somerset (Carr 1992). Given the paucity of evidence for coastal Roman sites and Roman ships, the potential for Roman activity within the study area as a result of trade activity cannot be discounted.

7.5.20 The only known heritage asset dating to the Romano-British period within the study area is a wooden stake alignment (MDV44570, CITiZAN ID 73248) which has been recorded 2.5 km north east of the Offshore Cable Corridor. The finding of pottery from South Devon or Dorset at the Roman period site of Beacon Hill on the Isle of Lundy suggests that the inhabitants of the island were integrated into the local coastal trading network (Lundy Field Society 2024).

7.5.21 There is moderate potential for Roman remains including evidence of near shore resource exploitation, trade and travel. Roman remains could be of up to high importance based on archaeological and historic interest. The importance of the remains would be dependent on the type, survival and extent of the remains identified.

Early Medieval (AD 410–1066)

7.5.22 It is currently unclear how Devon and Cornwall were impacted by the removal of Roman administration and the military, though there would have been a corresponding decline in Roman maritime activity. The archaeological record in Devon and Cornwall suggest that the nature of Romano-British society was different to the rest of the south of England making it possible that the local impact was relatively minimal (Webster *et al.* 2024). In the wake of the Roman departure, North Devon remained largely independent of the Saxon influx. Graves found on the Isle of Lundy suggested that the island became the home of a monastic community in the same manner as many islands around the British mainland (Lundy Field Society 2024). By the 10th century, Devon had been incorporated into the Saxon kingdom of Wessex following nearly a century of regular battles (Carver *et al*. 2013). The impact that this change in political governance had on the study area is currently unclear.

7.5.23 There is currently a lack of evidence, both onshore and within the marine environment, regarding the nature and extent of foreign trade or domestic coastal activity following the Roman withdrawal. It is likely that maritime activity within the study area continued throughout the early medieval period in spite of the possible reduction of foreign trade during the 5th and 6th centuries. Evidence suggests that trade links with continental Europe increased in the late 6th century continuing into the 9th century. Maritime vessels continued to increase in size and complexity through the early medieval period; however, smaller craft were commonly used for coastal and inshore activities.

7.5.24 Ships heading to port towns established during Anglo-Saxon rule including Barnstaple in the River Taw, 15 km to the north east of the north end of the OCC, and Bricgstow (modern Bristol) on the Severn estuary would likely have taken refuge in the bay during the early medieval period. The local coastal networks previously established would have continued during this period and the OCC would have been subject to regular activity within proximity to the coasts and for access to nearby islands including Lundy and the Scillies.

7.5.25 There is no known direct evidence of Norse activity within the study area but it is likely that the study area would have been traversed as part of the raiding and mercantile activity undertaken by the Norse. The North Devon coast was

reportedly attacked by Norse raiders in the late 9th century and late 10th century. There are some reports that there were attempts to intercept the raiding ships at sea with varying success (McGrail 1992).

7.5.26 It is possible that some of the 54 UKHO and two DHER unidentified wrecks within the study area are related to early medieval vessel losses. The ships would be of the clinker-style seen in the remains of Norse ships as well as Anglo-Saxon ship burials. Short distance travel may still have been undertaken in smaller logboats and willow and hide coracles in sheltered areas of the coast.

7.5.27 Resource exploitation activities, including but not limited to fishing and shellfish gathering, would have continued within the bay, Celtic Sea, and Atlantic Ocean. Evidence of resource extraction includes midden remains containing deposits of limpet shells were identified in Abbotsham 1.7 km to the east of the north end of the OCC. Further evidence of medieval activity is concentrated on the coast of Bideford Bay which includes a sand and clay layer containing animal hoof prints (MDV76315) thought to represent a medieval land surface, revealed on Northam Burrows foreshore, 4.5 km to the north east of the north end of the OCC.

7.5.28 There is moderate potential for early medieval remains including evidence of resource exploitation, trade and travel. Early medieval remains could be of up to high importance based on archaeological and historic interest. The importance of the remains would be dependent on the type, survival and extent of the remains identified.

Medieval (AD 1066–1540)

7.5.29 Maritime trade and transport continued to be an important activity within the study area following the conquest of the Anglo-Saxon kingdoms by the Normans. The ports on the west coast of Britain, including Barnstaple on the River Taw, Bideford on the River Torridge, and Bristol on the Severn continued to grow bringing in both domestic and foreign trade. The port of Barnstaple was important for local trade within the area as well as trade with Bristol, Wales and Ireland but never achieved the prominence of Bristol or the southern Devon ports of Plymouth, Exeter, or Dartmouth (Kowaleski 1992). Trade from the ports around Bideford Bay was dominated by cloth which by the late 15th century was distinctive enough to be sold as Barnstaples for export further afield (Childs 1992). The natural harbour of Bideford Bay would have been an important anchorage for any ships travelling along the western coast of Britain to the port of Bristol, ports in Wales, or the north west of England and would have seen high levels of activity throughout the period.

7.5.30 Historical documentation from the 13th century suggests that the Isle of Lundy was occupied by a village in the north of the island and two farms within the south with areas of common grazing (Lundy Field Society 2024). It is reported that the island was owned by the de Newmarch family from the 12th century who leased it to the de Mariscos in around 1150 (Landmark Trust 2024). Piratical activity began when Henry II gave the island to the Knights Templar in 1155, with the de Mariscos using the island as a base until William de Marisco was captured in 1242 following a failed murder plot on Henry III in the mid-13th century. Marisco Castle (NHLE 1016034), a fortress constructed on the orders of Henry III in 1243 when he recovered the island from William de Marisco, was built on a small bay on the south east end of the island, 5.1 km north of the OCC, to secure the island against future misuse (Landmark Trust 2024.).

7.5.31 Like in the early medieval period, resource exploitation activities would have continued within Bideford Bay, the Celtic Sea and Atlantic Ocean. The population within the land surrounding the bay and along the coasts continued to grow and would have made the area enticing for mercantile activity. It is possible that some of the 54 UKHO and two DHER unidentified wrecks within the study area are related to medieval vessel losses. The ships would be of the clinker-style or carvel-style but short distance travel was still undertaken in small logboats and coracles.

7.5.32 There is moderate potential for medieval remains including evidence of resource exploitation, trade, travel and piracy. Medieval remains could be of up to very high importance based on archaeological and historic interest. The importance of the remains would be dependent on the type, survival and extent of the remains identified.

Post-medieval (AD 1540–1900)

7.5.33 Britain as a whole became increasingly dependent on maritime activities as a result of advances in shipbuilding technology, the expansion of trade routes to south and east Asia and colonial expansion throughout the world. The increasing outward focus on maritime activity during the period built up the prominence and wealth of ports like Bristol, Swansea and Liverpool on the west coast of Britain. Local maritime trade continued with coastal routes servicing both large ports like Bristol as well as smaller ones like Barnstaple and Bideford. Merchant vessels were required to register their movements between English ports from the 16th century which allowed for a more accurate understanding of the nature, scale and routes of the local coastal shipping activity in the early post-medieval period (Youings and Cornford 1992, p.100). Maritime losses could also be tracked more easily as a result of better record keeping which became increasingly centralised following the creation of the Society for the Registry of Shipping, later the Lloyd's Register, formed in the mid-18th century though it was focused on ships over a certain tonnage so is limited in its scope as a complete record.

7.5.34 The OCC crosses portions of the Bristol Channel, Celtic Sea, and Atlantic Ocean which were exceptionally busy sea lanes during this period as the British Empire continued to grow. The western British ports in particular were heavily involved in what is called the 'triangle trade' in the 18th and 19th centuries which comprised the trade of slaves from the west coast of Africa to the United States and Caribbean to produce predominantly cash crops of cotton, tobacco and sugar. The raw materials would be shipped to ports like Bristol, Liverpool and Glasgow to be used in the manufacture of goods and the manufactured goods then shipped out to Africa for the purchase of slaves. Merchants in the western ports became wealthy and powerful from the goods and materials passing through the ports facilitated by this trade network.

7.5.35 Like in earlier periods, shipbuilding continued to be decentralised and local shipbuilding technologies exhibited the general trends with local variations. Shipwrecks are considered to provide 'significant information about shipyard practices and innovation and variation in ship design, as well as the origin of timber used and the repair and maintenance of vessels' for which information has not survived on land (Dellino-Musgrave and Ransley 2013,p.173). The ship material and building techniques evolved during this period from the traditional wooden carvel ships in the early centuries to predominantly iron and steel in the

later centuries in response to changing needs from both commercial and military organisations and pressures on natural resources.

7.5.36 Local resource exploitation activities would have continued within Bideford Bay, the Celtic Sea and Atlantic Ocean. Coastal and fishing vessels are likely to have been locally built and predominantly remained built of wood. The development of local types of smaller vessels exhibiting a mix of traditional features and new innovations created distinctive types including the Picarooner, a small fishing vessel common to the North Devon coast.

7.5.37 There is high potential for further post-medieval remains including evidence of resource exploitation, trade, military activity and travel. Post-medieval remains could be of up to high importance based on archaeological and historic interest. The importance of the remains would be dependent on the type, survival and extent of the remains identified.

Modern (AD 1900 – modern day)

7.5.38 The size of the ships in use for both the transport of goods and passengers as well as the military increased through the 20th century as the ship-building technology continued to evolve in response to changing needs from both commercial and military organisations. The development of aeroplane technology from a small industry to the main international transport industry of passengers also had an impact on maritime activity (Parham and Maddocks 2013). Goods continued to be shipped by sea but the size of the vessels necessitated the centralisation of ports. Local maritime activity increasingly became marginalised as local ports pivoted to service smaller leisure vessels or local fishing vessels as the transport of goods was undertaken from large container ports by motor vehicle.

7.5.39 In the early 20th century, a civilian airfield, the Barnstaple and North Devon Aerodrome, was constructed on the north shore of the Taw estuary, *c* 10 km to the north east of the northern end of the OCC, which was co-opted by the Royal Air Force in 1940 as part of the war effort to protect the coast (Southwest Airfields Heritage Trust 2017). The airfield was expanded through the construction of an aerodrome on the farmland of the Chivenor Farm and the base was named RAF Chivenor. Throughout the war, training and anti-submarine activities were undertaken from the base and 13 squadrons were stationed at one point or another during the war. The squadrons participated in patrolling the Bay of Biscay, the Celtic Sea and western approaches to the English Channel for protection from U-boats and other enemy submarines which were vulnerable to aerial attack (*ibid.*). Second World War military defence installations are recorded within the DHER and CITiZAN datasets including a site of anti-glider posts (MDV50849), which would have covered the beach at Westward Ho!, 2.5 km to the north east of the north end of the OCC and coastal anti-invasion defences (MDV102477) on the shore west of Northam Burrows on aerial photographs of the 1940s. After the conclusion of the Second World War, the airfield continued in use as an RAF base until the 1990s though predominantly as a training facility. It was taken over by the Royal Marines in the mid-1990s and is kept active for the use of RAF heavy transport aircraft (*ibid.*).

7.5.40 There is high potential for further modern remains including evidence of resource exploitation, military activity (shipwreck and aviation remains) and leisure shipwrecks. Modern remains could be of up to high importance based on

archaeological and historic interest. The importance of the remains would be dependent on the type, survival and extent of the remains identified.

Known wrecks and obstructions

Ship Remains

7.5.41 The majority of the known wrecks recorded within the DHER and UKHO databases within the study area are dated to the later post-medieval or modern periods (see Volume 3, Figure 7.1 of this PEIR). This is likely a result of better record keeping and local sources which reported on the lost ships and isn't representative of the full breadth of the potential wrecks within the study area.

Aviation remains

7.5.42 There is a single UKHO Wrecks and Obstructions record noted as an aircraft wreck (Wreck ID 12224) (see Volume 3, Figure 7.1 of this PEIR). It is possible that some of the 54 UKHO unidentified wrecks within the study area are related to aviation losses.

7.5.43 Where in situ remains associated with any military aviation losses are found and confirmed, they will be archaeologically significant and protected under the Protection of Military Remains Act 1986.

Fishermen's fasteners

7.5.44 Records classed as fishermen's fasteners, or which otherwise remain unidentified and are not associated with vessel or structural remains (including records classified as dead by the UKHO). They are unidentified obstructions reported by fishermen, possibly indicative of a wreck or submerged feature. No other baseline information is available for any of these obstructions, and while they may well represent archaeological remains, this is not possible to ascertain from the existing sources.

7.5.45 Within the study area, there are currently 138 records classed as fishermen's fasteners recorded by the UKHO (see Volume 3, Figure 7.1 of this PEIR).

Site-Specific Surveys

7.5.46 The results of the site-specific sub-bottom profiler (SBP), sidescan sonar (SSS), magnetometer (Mag) and multibeam echosounder (MBES) surveys are being reviewed and will be used to refine the importance / sensitivity of receptors and inform the assessment of effects reported within the Environmental Statement chapter.

Future Baseline Conditions

7.5.47 The existing environment for offshore archaeology and cultural heritage as set out above has been shaped by a combination of factors, with the most prevalent being changes in global sea levels and associated climatic and environmental conditions. These conditions have and continue to affect the burial and preservation of remains. Historic England (2024) recognises, that 'the marine and

inter-tidal zones are dynamic and have always undergone natural environmental change and changing patterns of use and exploitation which are nothing new'.

7.5.48 Marine physical processes, including the cycle of burial and exposure due to storm events, have an ongoing effect on the preservation of archaeological material. Sediment cover provides protection from physical marine processes, reducing the risk of erosion and degradation. It is not possible to assess the effect of this impact upon individual heritage assets as this will depend on the nature of the exposed heritage asset and site-specific conditions.

7.5.49 One of the key climate change induced changes to the baseline environment is predicted to be effects on extreme weather events, which could result in increased wave action. For the majority of the Offshore Cable Corridor this is expected to have negligible influence on the marine archaeological baseline over the course of the Proposed Development, on account principally of water depth (the sea bed would be beyond the reach of any wave action influence in deep waters; c.f. Volume 3, Chapter 8 of this PEIR: Physical Processes). Any heritage features in the shallower water depths will also be somewhat protected by existing sediment cover. The scale of potential change to significant wave heights is described broadly in Volume 3, Chapter 8 of this PEIR: Physical Processes. The current (PEIR stage reporting) baseline marine archaeology characterisation is deemed sufficient against which to assess construction, operational, and decommissioning phase impacts of the Proposed Development. The influence of increased future wave scour (climate induced) would be considered in conjunction with impacts from the proposed development within any site-specific mitigation strategies on any known or currently unknown heritage assets within the nearshore (<20 m water depth).

7.5.50 Underwater cultural heritage is also under threat from warming waters caused by climate change. As the sea levels rise the impact of the tidal activity on heritage assets within and adjacent to the intertidal will increase. In addition, warming waters result in the northward migration of invasive species, which may include the blacktip shipworm (Lyrodus pedicellatus), which is considered to be a major threat to wooden wrecks and other wooden structures within the marine environment.

7.5.51 Further marine infrastructure projects within the region will all have the potential to cause adverse direct impacts on heritage assets or contribute to beneficial impacts. This includes large-scale enhanced understanding of the archaeological resource through large area geophysical/geotechnical survey data released to the public domain or the enhanced knowledge of key characteristics, features or elements derived from site-specific survey and investigations.

Key Receptors

7.5.52 The potential key receptors that may be present within the Offshore study area are summarised as:

- Palaeolandscape features and sub-seabed deposits of palaeoenvironmental interest;
- Prehistoric occupation sites;
- Wooden shipwreck remains;
- iron shipwreck remains;

- steel shipwreck remains;
- aviation wreck remains; and
- Maritime occupation or utilisation activity related to all periods of human activity.

7.6 Key Parameters for Assessment

Maximum Design Scenario

7.6.1 The following section identifies the Maximum Design Scenario (MDS) in environmental terms, defined by the project design envelope. This is to establish the maximum potential impact associated with the project on marine heritage receptors. The engineering parameters of the project design envelope are defined in Volume 1, Chapter 3: Project description of the PEIR for further detail.

7.6.0 The maximum design scenarios identified in **Table 7.15** have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope provided in Volume 1, Chapter 3: Project description of the PEIR. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g., micro routing of infrastructure layout), to that assessed here be taken forward in the final design scheme. Therefore, this comprises a conservative assessment of a worst-case scenario.

Table 7.15: Maximum design scenario considered for the assessment of potential impacts

Potential Impact	Phase[1]					Maximum Design Scenario	Justification
	C	Op	Op repair	D *in-situ*	D remove		
Direct physical impacts leading to the total or partial loss of the marine heritage receptors	Yes	No	Yes	No	Yes	**Construction phase** Potential direct impact (to cultural heritage receptors) from seabed disturbance activities i.e. as a result of sandwave clearance, boulder clearance, pre-lay ploughing and seabed debris removal: • 7,400,000 m^2 footprint for sandwave clearance, use of mass flow excavation and/or seabed surface plough. Precautionary estimate assuming clearance along 50% of Offshore Cable Corridor (20 [w] x 370,000 [l] x 2 [n] x 50%). Seabed surface plough with swath width of 10-20 m wide. • 6,000,000 m^2 for boulder clearance, pre-lay plough with swath width of 10-15 m assumed across approximately 200 km of the cable route (15 [w] x 200,000 [l] x 2 [n]). • 740,000 m^2 for max (precautionary) seabed debris removal, pre-lay grapnel run with 1 m width and at maximum penetration depth of 1 m (1 [w] x 370,000 [l] x 2 [n]). • 11,100,000 m^2 for max (precautionary) pre-lay trench ploughing with disturbance width of 15 m (15 [w] x 370,000 [l] x 2 [n].	The Offshore Cable Corridor is 370 km long in UK waters. Whilst the Offshore Cable Corridor is generally 500 m wide, the maximum area of (seabed) disturbance will be determined by the width of the route preparation and installation plant required. The provisional BAS provides seabed and burial risks which provide high level indication of most likely installation techniques.
						Operational phase n/a **Operational phase - repair** Direct impact from disturbance to cultural heritage receptors, localised to the area of the repair. (Infrequent, isolated repair activities).	
						Decommissioning phase - *in-situ*	

Potential Impact	Phase[1]					Maximum Design Scenario	Justification
	C	Op	Op repair	D *in-situ*	D remove		
						n/a **Decommissioning phase - removal** Direct impact from disturbance to cultural heritage receptors adjacent to the cable corridor.	
Indirect impact to cultural heritage receptors (e.g. from disturbance of sediments, or scour)	No	Yes	No	Yes	Yes	**Construction phase** n/a **Operation and Maintenance phases** Indirect impact from disturbance to cultural heritage receptors in close proximity to the Proposed Development during operation/maintenance arising from altered sea-bed conditions, e.g. scour or differential deposition of sediments. Maximum height of rock protection - up to 1.4 m at crossings and <1 m elsewhere. **Decommissioning phase - *in-situ* and removal** Indirect impact on cultural heritage receptors from disturbance of sea-bed conditions adjacent to the installed cable / removal works.	The range of sediment disturbance activities characterised at PEIR by the Physical Processes assessment has been reviewed, with characterisations used to inform the assessment of marine archaeology and cultural heritage receptors.

[1] C=Construction phase, Op=Operational phase, Oprepair=Operational phase repair activities, Din-situ=Decommissioning phase assuming cable de-energised and left in-situ, Dremove=Decommissioning phase assuming cable removed.

7.7 Mitigation Measures Adopted as Part of the Proposed Development

7.7.1 As part of the design process a number of adopted mitigation measures are proposed to reduce the potential for impacts on Marine Archaeological and Cultural Heritage receptors. The adopted mitigation measures will evolve over the development process as the EIA progresses and in response to consultations as necessary. The measures adopted are set out in **Table 7.16**.

7.7.2 The mitigation measures proposed as part of the Proposed Development include the following types of mitigation:

- Primary (inherent) mitigation – measures included as part of the Proposed Development design. The Institute of Environmental Management and Assessment (IEMA) describes these as '*modifications to the location or design of the development made during the pre-application phase that are an inherent part of the Proposed Development and do not require additional action to be taken*'. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself, through the description of the Proposed Development and the parameters secured in the DCO and/or marine licences. For example, a reduction in footprint or height.
- Secondary (foreseeable) mitigation. IEMA describes these as '*actions that will require further activity in order to achieve the anticipated outcome'*. These include measures required to reduce the significance of environmental effects (such as lighting limits) and may be secured through an environmental management plan.
- Tertiary (inexorable) mitigation. IEMA describes these as '*actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects*'. It may be helpful to secure such measures through the Offshore Construction Environmental Management Plan (an outline Offshore CEMP is provided as PEIR Volume 1, Appendix 3.3, which will continue to be developed and submitted as part of the DCO application).

Table 7.16: Mitigation measures adopted as part of the Proposed Development

Measure Adopted	How the Measure Will be Secured
Primary mitigation	
Proactive management of Marine Archaeology and Cultural Heritage throughout the project.	Offshore Cable Corridor has undergone multiple route optimisations, which have included avoidance of known marine archaeological features. Micro-routing of the offshore cable corridor will be undertaken where possible and archaeological exclusion zones applied to avoid direct impacts on archaeology and cultural heritage assets and submerged land surfaces beneath marine sediments where possible.

Measure Adopted	How the Measure Will be Secured
Avoidance of known sites of archaeological significance	Mitigation leading to preservation *in situ* will be advocated and Archaeological Exclusion Zones (recommended of at least 50 m) will be implemented around cultural heritage assets.
Secondary mitigation	
Archaeological assessment of available data	Offshore geophysical surveys (including future UXO surveys as necessitated) and any additional offshore geotechnical campaigns undertaken pre-construction will be subject to archaeological review, where relevant in consultation with Historic England. Relevant results from geotechnical surveys will be released / shared with ADS, with the aim to enhance the palaeogeographic knowledge and understanding of the area.
Tertiary mitigation	
Protocol for Archaeological Discoveries (PAD)	Additional unknown or unexpected cultural heritage and marine heritage receptors identified during the project stages will be reported utilising the project specific PAD, which will form part of the Offshore CEMP.
Identification and recording of sites of unknown archaeological significance	Offshore CEMP to include protocols should archaeological features be identified, which will be linked to the Offshore Outline Archaeological WSI (a draft outline WSI accompanies this PEIR, which will be refined for the ES). An outline Offshore CEMP is provided as PEIR Volume 1, Appendix 3.3.
Reporting and recording of items of potential archaeological interest	A draft Offshore Outline Archaeological WSI (Volume 3, Appendix 7.2) accompanies this PEIR. This will be refined for the ES, with site-specific WSIs produced prior to commencing construction, to inform specific investigation activities to record cultural heritage assets and subsequently the production of a post-excavation report.

7.8 Preliminary Assessment of Construction Effects

7.8.1 It should be noted that at PEIR stage, the archaeological and cultural heritage reviews of the survey data are ongoing and as such the baseline characterisations and resultant impact assessment on maritime heritage receptors is provisional. The following assessment has been undertaken on a worst-case scenario and has assumed that the mitigation measure utilised would be preservation by record scoped through a WSI. The confidence in the assessment at the PEIR stage is low.

7.8.2 The preliminary potential impacts arising from the construction phase of the Proposed Development are summarised in **Table 7.8**, along with the maximum design scenario against which each impact has been assessed.

7.8.3 A description of the potential effect on receptors caused by each identified impact is given below.

Impact 1: Direct disturbance of sediment during seabed preparation works

7.8.4 Direct impact of sediment removal containing undisturbed archaeological contexts during seabed preparation ahead of construction activities leading to the total or partial loss of marine heritage receptors.

Sensitivity of the Receptors

7.8.5 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings will be moderated.

7.8.6 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. To inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.8.7 Palaeolandscape features are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.8 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.9 Prehistoric occupation sites are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.10 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.11 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.12 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.8.13 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.14 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.8.15 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.8.16 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate impact to the receptor.

7.8.17 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.8.18 A revised assessment will be provided at the detailed ES stage.

7.8.19 The impact to palaeolandscape features is predicted to be a partial change to the receptor and permanent. The magnitude is **low adverse**.

7.8.20 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a partial change to the receptor and permanent. The magnitude is **low adverse**.

7.8.21 The impact to prehistoric occupation sites is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium adverse**.

7.8.22 The impact to wooden shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium adverse**.

7.8.23 The impact to iron shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium adverse**.

7.8.24 The impact to steel shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium adverse**.

7.8.25 The impact to aviation wreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium adverse**.

7.8.26 The impact to remains of maritime occupation or utilisation activity is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium adverse**.

Significance of the Effect

7.8.27 Overall, the magnitude of the impact to palaeolandscape feature remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate or minor adverse** significance, which is significant.

7.8.28 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate or minor** adverse significance, which is significant.

7.8.29 Overall, the magnitude of the impact to prehistoric occupation sites is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major or moderate** adverse significance, which is significant.

7.8.30 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** adverse significance, which is significant.

7.8.31 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** adverse significance, which is significant.

7.8.32 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.8.33 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major or moderate** adverse significance, which is significant.

7.8.34 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

Further Mitigation

7.8.35 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- Geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation (ongoing, see PEIR Volume 3, Appendix 7.1: Stage 1 Geoarchaeological Review of Marine Geotechnical Investigation);
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision; and

- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison.

7.8.36 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via mitigation measures provided in the final Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms (Draft Offshore Outline Archaeological WSI is available at the time of PEIR drafting: PEIR Volume 3, Appendix 7.2).

Impact 2: Direct disturbance from compression or penetration during construction

7.8.37 Direct impact by penetration, compression, and disturbance during seabed preparation, laying of cables and laying of rock berm over cable crossings leading to the total or partial loss of marine heritage receptors.

Sensitivity of the Receptors

7.8.38 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.8.39 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.8.40 Palaeolandscape features are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.41 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.42 Prehistoric occupation sites are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.43 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.44 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.45 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.8.46 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.47 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.8.48 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.8.49 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.8.50 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.8.51 A revised assessment will be provided at the detailed ES stage.

7.8.52 The impact to palaeolandscape features is predicted to be a partial change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.8.53 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a partial change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.8.54 The impact to prehistoric occupation sites is predicted to be a substantial change to the receptor and permanent. The magnitude is expected to be no more than **medium** adverse.

7.8.55 The impact to wooden shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is expected to be no more than **medium** adverse.

7.8.56 The impact to iron shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is expected to be no more than **medium** adverse.

7.8.57 The impact to steel shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is expected to be no more than **medium** adverse.

7.8.58 The impact to aviation wreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is expected to be no more than **medium** adverse.

7.8.59 The impact to remains of maritime occupation or utilisation activity is predicted to be a substantial change to the receptor and permanent. The magnitude is expected to be no more than **medium** adverse.

Significance of the Effect

7.8.60 Overall, the magnitude of the impact to palaeolandscape feature remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor adverse** significance, which is significant.

7.8.61 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate or minor** adverse significance, which is significant.

7.8.62 Overall, the magnitude of the impact to prehistoric occupation sites is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.63 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.64 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.65 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.8.66 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.67 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

Further Mitigation

7.8.68 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision, and
- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison.

7.8.69 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via final mitigation measures provided in the Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

Impact 3: Direct disturbance from compression or penetration by anchoring during seabed preparation works and construction

7.8.70 Direct impact by penetration, compression, and disturbance effects of jack-up barges and anchoring of construction vessels during construction activities leading to total or partial loss of marine heritage receptors.

Sensitivity of the Receptors

7.8.71 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.8.72 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource

exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.8.73 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.74 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.75 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.76 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.77 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.78 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.8.79 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.80 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.8.81 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.8.82 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.8.83 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or

- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.8.84 A revised assessment will be provided at the detailed ES stage (see also '**Further Mitigation**' section below).

7.8.85 The impact to palaeolandscape features is predicted to be a slight alteration to the receptor and permanent. The magnitude is **negligible** adverse.

7.8.86 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a slight alteration to the receptor and permanent. The magnitude is **negligible** adverse.

7.8.87 The impact to prehistoric occupation sites is predicted to be a partial change to the receptor and permanent. The magnitude is **medium** adverse.

7.8.88 The impact to wooden shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium** adverse.

7.8.89 The impact to iron shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium** adverse.

7.8.90 The impact to steel shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium** adverse.

7.8.91 The impact to aviation wreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium** adverse.

7.8.92 The impact to remains of maritime occupation or utilisation activity is predicted to be a substantial change to the receptor and permanent. The magnitude is **medium** adverse.

Significance of the Effect

7.8.93 Overall, the magnitude of the impact to palaeolandscape feature remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.8.94 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.8.95 Overall, the magnitude of the impact to prehistoric occupation sites is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.96 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.97 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.98 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.8.99 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.100 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.8.101 It is expected that the archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations will reduce the significance of effect of this impact through precise application of the identified mitigation measures (**Table 7.16**).

Impact 4: Indirect disturbance from scour during construction works

7.8.102 Indirect impacts upon known and potential marine archaeological receptors as a result of changes to sedimentation and erosion patterns.

Sensitivity of the Receptors

7.8.103 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.8.104 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.8.105 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.106 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.107 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.108 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.109 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.110 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.8.111 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.112 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.8.113 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.8.114 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.8.115 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.8.116 A revised assessment will be provided at the detailed ES stage.

7.8.117 The impact to palaeolandscape features is predicted to be a partial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.118 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a partial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.119 The impact to prehistoric occupation sites is predicted to be a substantial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.120 The impact to wooden shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.121 The impact to iron shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.122 The impact to steel shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.123 The impact to aviation wreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is **low** adverse.

7.8.124 The impact to remains of maritime occupation or utilisation activity is predicted to be a substantial change to the receptor and permanent. The magnitude is **low** adverse.

Significance of the Effect

7.8.125 Overall, the magnitude of the impact to palaeolandscape feature remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.126 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.127 Overall, the magnitude of the impact to prehistoric occupation sites is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.128 Overall, the magnitude of the impact to wooden shipwreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.129 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.130 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.8.131 Overall, the magnitude of the impact to aviation wreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.132 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **low** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

Further Mitigation

7.8.133 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision,
- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison, and
- the introduction of material to consolidate soft soils overlying archaeological remains to limit the impact of scouring.

7.8.134 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via final mitigation measures provided in the Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

Impact 5: Indirect disturbance from discovery

7.8.135 Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities.

Sensitivity of the Receptors

7.8.136 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.8.137 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel

infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.8.138 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.139 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.140 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.141 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.142 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.143 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.8.144 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.8.145 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.8.146 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.8.147 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.8.148 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.8.149 A revised assessment will be provided at the detailed ES stage.

7.8.150 The impact to palaeolandscape features is predicted to be slight benefits to understanding of the receptor. The magnitude is therefore **low beneficial**.

7.8.151 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a slight alteration to the receptor and permanent. The magnitude is therefore **low beneficial**.

7.8.152 The impact to prehistoric occupation sites is predicted to be a slight alteration to the receptor and permanent. The magnitude is therefore **low** adverse.

7.8.153 The impact to wooden shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is therefore **moderate** adverse.

7.8.154 The impact to iron shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is therefore **moderate** adverse.

7.8.155 The impact to steel shipwreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is therefore **moderate** adverse.

7.8.156 The impact to aviation wreck remains is predicted to be a substantial change to the receptor and permanent. The magnitude is therefore **moderate** adverse.

7.8.157 The impact to remains of maritime occupation or utilisation activity is predicted to be a substantial change to the receptor and permanent. The magnitude is therefore **low** adverse.

Significance of the Effect

7.8.158 Overall, the magnitude of the impact to palaeolandscape feature remains is **low** beneficial and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** beneficial significance, which is significant.

7.8.159 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** beneficial and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.160 Overall, the magnitude of the impact to prehistoric occupation sites is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.8.161 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.162 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.163 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.8.164 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.8.165 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **low** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

Further Mitigation

7.8.166 It is recommended that the limits of the prehistoric occupation sites, shipwreck sites of all types, aircraft wrecks and the maritime occupation or utilisation sites be determined and the remains within the determined limits be recorded as soon as possible following discovery in order to record a baseline for the receptors. This recording would mitigate the impact of potential illicit activity on the receptor through preservation by record and enable an accurate AEZ to be implemented around the newly identified receptor.

Future Monitoring

7.8.167 Future monitoring of activity and impact within the AEZ boundary will be required to ensure that the identified receptors have not been impacted.

7.8.168 Any remains that have the potential to be designated as either scheduled monuments or protected wrecks or are under consideration for designation will need to regular monitoring to ensure that the regulations governing activities within the boundaries are adhered to.

7.9 Assessment of Operational Effects

7.9.1 The impacts of the operation and maintenance phase of the Proposed Development have been assessed. The potential impacts arising from the operation and maintenance phase of the Proposed Development are listed in **Table 7.8**, along with the maximum design scenario, described in **Table 7.15,** against which each impact has been assessed.

7.9.2 A description of the potential effect on receptors caused by each identified impact is given below.

Impact 6: Direct disturbance from compression or penetration as a result of maintenance activities

7.9.3 Direct impact by penetration, compression and disturbance effects of maintenance activities at the cable corridor leading to total or partial loss of marine heritage receptors.

Sensitivity of the Receptors

7.9.4 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.9.5 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.9.6 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.7 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.8 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.9 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.10 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.11 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.9.12 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.13 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is medium.

Magnitude of Impact

7.9.14 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.9.15 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.9.16 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.9.17 A revised assessment will be provided at the detailed ES stage.

7.9.18 The impact to palaeolandscape features is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **negligible** adverse.

7.9.19 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **negligible** adverse.

7.9.20 The impact to prehistoric occupation sites is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.9.21 The impact to wooden shipwreck remains is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.9.22 The impact to iron shipwreck remains is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.9.23 The impact to steel shipwreck remains is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.9.24 The impact to aviation wreck remains is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

7.9.25 The impact to remains of maritime occupation or utilisation activity is predicted to be a slight change to the receptor and permanent. The magnitude is expected to be no more than **low** adverse.

Significance of the Effect

7.9.26 Overall, the magnitude of the impact to palaeolandscape feature remains is negligible adverse and the sensitivity of the receptor is high. The effect will, therefore, be of minor adverse significance, which is not significant.

7.9.27 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.28 Overall, the magnitude of the impact to prehistoric occupation sites is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.9.29 Overall, the magnitude of the impact to wooden shipwreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.9.30 Overall, the magnitude of the impact to iron shipwreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.9.31 Overall, the magnitude of the impact to steel shipwreck remains is **low** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.32 Overall, the magnitude of the impact to aviation wreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of moderate or **minor** adverse significance, which is significant.

7.9.33 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **low** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

Further Mitigation

7.9.34 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision, and
- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison.

7.9.35 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via final mitigation measures provided in the Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

Impact 7: Direct disturbance from compression or penetration by anchoring as a result of maintenance activities

7.9.36 Direct impact by penetration, compression, and disturbance effects of jack-up barges and anchoring of operation and maintenance vessels during the operation and maintenance phase leading to total or partial loss of marine heritage receptors.

Sensitivity of the Receptors

7.9.37 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.9.38 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.9.39 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.40 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.41 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.42 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.43 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.44 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.9.45 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.46 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.9.47 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.9.48 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.9.49 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.9.50 A revised assessment will be provided at the detailed ES stage.

7.9.51 The impact to palaeolandscape features is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.9.52 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.9.53 The impact to prehistoric occupation sites is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.9.54 The impact to wooden shipwreck remains is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.9.55 The impact to iron shipwreck remains is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.9.56 The impact to steel shipwreck remains is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.9.57 The impact to aviation wreck remains is predicted to be a slight alteration to the receptor and permanent. The magnitude is therefore **low** adverse.

7.9.58 The impact to remains of maritime occupation or utilisation activity is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

Significance of the Effect

7.9.59 Overall, the magnitude of the impact to palaeolandscape feature remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.60 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.61 Overall, the magnitude of the impact to prehistoric occupation sites is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.62 Overall, the magnitude of the impact to wooden shipwreck remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.63 Overall, the magnitude of the impact to iron shipwreck remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.9.64 Overall, the magnitude of the impact to steel shipwreck remains is **negligible** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** or **negligible** adverse significance, which is not significant.

7.9.65 Overall, the magnitude of the impact to aviation wreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.9.66 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **negligible** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** or **negligible** adverse significance, which is not significant.

7.9.67 It is expected that the archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations will reduce the significance of effect of this impact through precise application of the identified mitigation measures (**Table 7.16**).

Impact 8: Indirect disturbance from scour during operation

7.9.68 Indirect impacts causing disturbance of sediment containing potential marine heritage receptors during maintenance activities leading to the exposure of those

marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.

Sensitivity of the Receptors

7.9.69 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.9.70 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.9.71 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.72 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.73 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.74 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.75 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.76 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.9.77 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.9.78 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.9.79 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.9.80 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.9.81 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.9.82 A revised assessment will be provided at the detailed ES stage.

7.9.83 The impact to palaeolandscape features is predicted to be a slight change to the receptor and permanent. The magnitude is therefore **low** adverse.

7.9.84 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a slight change to the receptor and permanent. The magnitude is therefore **low** adverse.

7.9.85 The impact to prehistoric occupation sites is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.9.86 The impact to wooden shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.9.87 The impact to iron shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.9.88 The impact to steel shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.9.89 The impact to aviation wreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.9.90 The impact to remains of maritime occupation or utilisation activity is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

Significance of the Effect

7.9.91 Overall, the magnitude of the impact to palaeolandscape feature remains is low adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.9.92 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.9.93 Overall, the magnitude of the impact to prehistoric occupation sites is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.9.94 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.9.95 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.9.96 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.9.97 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.9.98 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

Further Mitigation

7.9.99 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision,
- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison, and
- the introduction of material to consolidate soft soils overlying archaeological remains to limit the impact of scouring.

7.9.100 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via final mitigation measures provided in the Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

Future Monitoring

7.9.101 Future monitoring of activity and impact within the AEZ boundaries will be required to ensure that the identified receptors have not been impacted.

7.9.102 Any remains that have the potential to be designated as either scheduled monuments or protected wrecks or are under consideration for designation will need regular monitoring to ensure that the regulations governing activities within the boundaries are adhered to.

Potential Changes to the Assessment as a Result of In-Combination Climate Impacts

7.9.103 Climate change has the potential to introduce invasive species that may directly affect maritime cultural assets that have been exposed or disturbed as a result of the proposed development works. Additionally, any remains that are exposed as a result of direct impact from construction or maintenance activities or as a result indirect impact from scour may be subject to more intense physical and chemical processes resulting in accelerated degradation of the asset.

7.10 Assessment of Decommissioning Effects

Impact 9: Indirect disturbance from scour during decommissioning (*in-situ*)

7.10.1 Indirect impacts causing disturbance of sediment containing potential marine heritage receptors from leaving the cable and cable protection infrastructure *in-situ* leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.

Sensitivity of the Receptors

7.10.2 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.10.3 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of

high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.10.4 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.5 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.6 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.7 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.8 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.9 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.10.10 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is high.

7.10.11 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.10.12 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.10.13 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.10.14 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.10.15 A revised assessment will be provided at the detailed ES stage.

7.10.16 The impact to palaeolandscape features is predicted to be a slight change to the receptor and permanent. The magnitude is therefore **low** adverse.

7.10.17 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a slight change to the receptor and permanent. The magnitude is therefore **low** adverse.

7.10.18 The impact to prehistoric occupation sites is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.19 The impact to wooden shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.20 The impact to iron shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.21 The impact to steel shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.22 The impact to aviation wreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.23 The impact to remains of maritime occupation or utilisation activity is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

Significance of the Effect

7.10.24 Overall, the magnitude of the impact to palaeolandscape feature remains is low adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate or minor** adverse significance, which is significant.

7.10.25 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.10.26 Overall, the magnitude of the impact to prehistoric occupation sites is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.27 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.28 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.29 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.10.30 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is high. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.31 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

Further Mitigation

7.10.32 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision,
- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison, and
- the introduction of material to consolidate soft soils overlying archaeological remains to limit the impact of scouring.

7.10.33 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via final mitigation measures provided in the Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

Impact 10: Direct impact from compression, penetration, or disturbance during decommissioning (removal of cable)

7.10.34 Direct impacts by penetration, compression and disturbance through removal activities and the anchoring of vessels during the decommissioning phase leading to further degradation of marine heritage receptors.

Sensitivity of the Receptors

7.10.35 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.10.36 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.10.37 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.38 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.39 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.40 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.41 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.42 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.10.43 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.44 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.10.45 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.10.46 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.10.47 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.10.48 A revised assessment will be provided at the detailed ES stage.

7.10.49 The impact to palaeolandscape features is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.10.50 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.10.51 The impact to prehistoric occupation sites is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.10.52 The impact to wooden shipwreck remains is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.10.53 The impact to iron shipwreck remains is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.10.54 The impact to steel shipwreck remains is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

7.10.55 The impact to aviation wreck remains is predicted to be a slight alteration to the receptor and permanent. The magnitude is therefore **low** adverse.

7.10.56 The impact to remains of maritime occupation or utilisation activity is predicted to be a very limited alteration to the receptor and permanent. The magnitude is therefore **negligible** adverse.

Significance of the Effect

7.10.57 Overall, the magnitude of the impact to palaeolandscape feature remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.10.58 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.10.59 Overall, the magnitude of the impact to prehistoric occupation sites is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.10.60 Overall, the magnitude of the impact to wooden shipwreck remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of minor adverse significance, which is not significant.

7.10.61 Overall, the magnitude of the impact to iron shipwreck remains is **negligible** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **minor** adverse significance, which is not significant.

7.10.62 Overall, the magnitude of the impact to steel shipwreck remains is **negligible** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** or **negligible** adverse significance, which is not significant.

7.10.63 Overall, the magnitude of the impact to aviation wreck remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.10.64 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **negligible** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **minor** or **negligible** adverse significance, which is not significant.

Further Mitigation

7.10.65 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision, and
- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison.

7.10.66 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via mitigation measures provided in the Offshore Outline Archaeological WSI (final

version) result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

Impact 11: Indirect disturbance from scour during decommissioning (removal of cable)

7.10.67 Indirect impacts causing disturbance of sediment containing potential marine heritage receptors from removal of the cable and cable protection infrastructure leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.

Sensitivity of the Receptors

7.10.68 The sensitivity (importance) of the receptors presented at PEIR stage is considered provisional and is considered a worst-case scenario (see **Table 7.10** for criteria definitions). For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow a more detailed assessment to be presented. Where justified, based on the detailed characterisations, the local sensitivity (importance) ratings may be moderated.

7.10.69 A review of the existing archival research and available data from the DHER, UKHO, and Historic England databases (see **section 7.5**) has shown that the study area contains high potential for remains from the early prehistoric periods through the modern period. In order to inform the PEIR assessment, assumptions have been used in regard to the survival of the potential remains and the importance of those remains. A worst-case scenario of high survival of remains of high importance has been assumed for all receptor types with the exception of steel shipwrecks and remains of maritime occupation or utilisation activity which are assumed to have medium importance for the following reasons. Steel shipwrecks date to the late post-medieval and modern periods and are the most common wreck type recorded in the available databases; therefore, their historic and archaeological interest is more understood within the study area. Remains of maritime occupation or utilisation activity is generally comprised of local resource exploitation (i.e. fishing, salt production, seaweed cultivation, etc.) and local travel infrastructure and its archaeological and historic interest can be more easily characterised and understood.

7.10.70 Palaeolandscape features are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.71 Sub-seabed deposits of palaeoenvironmental interest are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.72 Prehistoric occupation sites are vulnerable to physical impact within the footprint of the proposed works. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.73 Wooden shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.74 Iron shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.75 Steel shipwreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

7.10.76 Aviation wreck remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **high**.

7.10.77 Maritime occupation or utilisation activity remains are vulnerable to impact. The receptor does not recover once impacted. The sensitivity of the receptor is **medium**.

Magnitude of Impact

7.10.78 The description of potential magnitude of effects on marine archaeology and heritage features is considered provisional at PEIR stage (see **Table 7.11** for definitions). The Proposed Development includes embedded mitigation measures (**section 7.7** of this chapter) that are specifically intended to minimise the magnitude of potential effects; these include preservation *in-situ* (micro-routing around known sites of archaeological significance and the use and adherence to AEZs) and preservation by record (archaeological recording of remains prior to, during, or after impact).

7.10.79 The Proposed Development embedded mitigation includes archaeological assessment of the offshore geophysical surveys. The results of these detailed archaeological reviews are unavailable at PEIR stage. The worst case mitigation scenario has been assumed within this preliminary assessment i.e. assumes preservation by record which does not fully mitigate the impact to receptor.

7.10.80 For the final ES, the detailed archaeological review of the geophysical survey data and the borehole cores will allow specific mitigation to be developed and targeted, hence there may be potential to:

- reduce the potential magnitude for some impacts;
- remove the pathway for effect; or
- increase confidence in the assessment such that a lower magnitude rating is deemed appropriate.

7.10.81 A revised assessment will be provided at the detailed ES stage.

7.10.82 The impact to palaeolandscape features is predicted to be a slight change to the receptor and permanent. The magnitude is therefore **low** adverse.

7.10.83 The impact to sub-seabed deposits of palaeoenvironmental interest is predicted to be a slight change to the receptor and permanent. The magnitude is therefore **low** adverse.

7.10.84 The impact to prehistoric occupation sites is predicted to be a partial change to the receptor and permanent. The magnitude is therefore medium adverse.

7.10.85 The impact to wooden shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.86 The impact to iron shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.87 The impact to steel shipwreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.88 The impact to aviation wreck remains is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

7.10.89 The impact to remains of maritime occupation or utilisation activity is predicted to be a partial change to the receptor and permanent. The magnitude is therefore **medium** adverse.

Significance of the Effect

7.10.90 Overall, the magnitude of the impact to palaeolandscape feature remains is **low** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **moderate or minor** adverse significance, which is significant.

7.10.91 Overall, the magnitude of the impact to sub-seabed deposits of palaeoenvironmental interest is **low** adverse and the **sensitivity** of the receptor is high. The effect will, therefore, be of **moderate** or **minor** adverse significance, which is significant.

7.10.92 Overall, the magnitude of the impact to prehistoric occupation sites is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.93 Overall, the magnitude of the impact to wooden shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.94 Overall, the magnitude of the impact to iron shipwreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.95 Overall, the magnitude of the impact to steel shipwreck remains is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

7.10.96 Overall, the magnitude of the impact to aviation wreck remains is **medium** adverse and the sensitivity of the receptor is **high**. The effect will, therefore, be of **major** or **moderate** adverse significance, which is significant.

7.10.97 Overall, the magnitude of the impact to remains of maritime occupation or utilisation activity is **medium** adverse and the sensitivity of the receptor is **medium**. The effect will, therefore, be of **moderate** adverse significance, which is significant.

Further Mitigation

7.10.98 Detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing. These detailed reviews will allow a mitigation strategy specific to each identified feature of archaeological interest to be developed. The mitigation strategy may include, but is not limited to:

- geoarchaeological assessment and testing of the surviving borehole cores taken during the 2023 geotechnical investigation,
- taking and analysing additional targeted boreholes under geoarchaeological direction and supervision,

- recording the limits of any potential wreck sites identified during the 2023 geophysical surveys to provide a baseline record of the site in order to enable future comparison, and
- the introduction of material to consolidate soft soils overlying archaeological remains to limit the impact of scouring.

7.10.99 The mitigation strategy will be determined through consultation with Historic England. It is anticipated that adverse effects on all identified receptors will, via final mitigation measures provided in the Offshore Outline Archaeological WSI result in impacts of minor adverse significance or less i.e. not significant in EIA terms.

7.11 Cumulative Environmental Assessment

7.11.1 The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Proposed Development together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see Volume 1, Appendix 5.3: CEA screening matrix). Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

7.11.2 The Marine Archaeology CEA methodology has followed the methodology set out in Volume 1, Chapter 5: EIA methodology of the PEIR. As part of the assessment, all projects and plans considered alongside the Proposed Development have been allocated into ‘tiers’ reflecting their current stage within the planning and development process (as advocated under the Planning Act, 2008).

- Tier 1
  - Under construction;
  - Permitted application(s), but not yet implemented;
  - Submitted application(s), not yet determined; and
  - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact
- Tier 2
  - Scoping report has been submitted
- Tier 3
  - Scoping report has not been submitted
  - Identified in the relevant Development Plan
  - Identified in other plans and programmes.

7.11.3 This tiered approach is adopted to provide a clear assessment of the Proposed Development alongside other projects, plans and activities.

7.11.4 The specific projects, plans and activities scoped into the CEA, are outlined in **Table 7.17**.

Table 7.17: List of cumulative developments considered within the CEA

Project	Status	Distance from Proposed Development (nearest point, km)	Description	Dates of Construction (if available)	Dates of Operation (if available)	Overlap with the Proposed Development?
Tier 1						
Celtic Interconnector	Permitted	Crosses offshore cable corridor	700 MW high-voltage direct current submarine power cable under construction between the southern coast of Ireland and the north-west coast of France. The UK elements of the Celtic Interconnector comprise: • A submarine cable within the UK EEZ approximately 211km in length placed on or beneath the seabed. It passes approximately 30km west of the Isles of Scilly and approximately 75km west of Land's End, but does not enter UK Territorial Waters. • Secondary rock protection using rock placement (if required), where target depth of cable lowering is not fully achieved or at cable crossings, with a linear extent of between 0km and 80km or 0 to 270 tonnes. • A fibre optic link shall be laid along the cable route for operational control, communication and telemetry purposes.	It is programmed that installation phase of the offshore route will commence in 2024	Fully operational by 2027	No construction overlap, however, there will be operational overlap
White Cross Floating Offshore Windfarm	Permitted	7.8, with the Offshore Cable Corridor overlapping / directly adjacent to the White Cross Cable Corridor.	Proposed offshore windfarm located in the Celtic Sea with a capacity of up to 100 MW. The Windfarm Site is located over 52km off the North Cornwall and North Devon coast (west-north-west of Hartland Point), in a water depth of 60m – 80m. The Windfarm Site covers 50km2. The current wind turbine design envelope for the project is a WTG capacity of 12-24 MW, 6-8 three	Construction is anticipated to commence in mid-2024.	Anticipated to be operational by 2026	Offshore Cable Corridor overlapping / directly adjacent to the White Cross Cable Corridor.

Project	Status	Distance from Proposed Development (nearest point, km)	Description	Dates of Construction (if available)	Dates of Operation (if available)	Overlap with the Proposed Development?
			bladed horizontal axis turbines with a rotor diameter of 220-300 m.			
Tier 2						
N/A						
Tier 3						
The Crown Estate's Celtic Sea Floating Offshore Wind Leasing Round 5 - Project Development Area 3 (PDA3)	Future Planned Development	Overlaps with portion of the offshore cable corridor	PDA 3 sits within English Governance and is one of three suitable PDAs identified within the Celtic Sea for floating offshore wind development, each of which having a potential capacity of up to 1.5 GW.	N/A (Currently in the early stages of the project, the schedule for PDA 3 is unknown, however, pre-consent metocean surveys are planned for early 2024 and geotechnical investigations are planned for summer 2024.)	N/A	As the schedule for PDA3 is currently unknown, there remains the potential for construction and operational overlap with the Proposed Development

Cumulative Effects Assessment

7.11.5 A description of the significance of cumulative effects upon marine archaeology and cultural heritage receptors arising from construction and operation is given below.

Construction

Tier 1 Projects

7.11.6 Impacts from the Celtic Interconnector and White Cross Floating Offshore Windfarm have the potential to impact on the same marine archaeology and cultural heritage receptors where the developments overlap, cross or run adjacent. The impacts would be direct, through impacts from penetration or compression and impacts during seabed preparation, and indirect through changes in the geomorphology of the seabed. The significance of effect would be dependent on the type of receptor impacted and the footprint of impact.

7.11.7 The significance of any cumulative assessment with Tier 1 projects will be presented at ES stage, following identification of features of archaeological interest, (detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing). The detailed reviews will allow a mitigation strategy specific to each identified feature to be developed, and thus potential for cumulative impacts to be better understood.

Tier 2 Projects

7.11.8 There are no Type 2 projects expected to cause cumulative effects for marine archaeology and cultural heritage.

Tier 3 Projects

7.11.9 Impacts from The Crown Estate's Celtic Sea Floating Offshore Wind Leasing Round 5 - Project Development Area 3 (PDA3) have the potential to impact on the same marine archaeology and cultural heritage receptors where the developments overlap, cross or run adjacent. The impacts would be direct, through impacts from penetration or compression during maintenance activities, and indirect, as a result of geomorphological changes from sea bed disturbance. The significance of effect would be dependent on the type of receptor impacted and the type of impact.

7.11.10 The significance of any cumulative assessment with Tier 3 projects will be presented at ES stage, following identification of features of archaeological interest, (detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing). The detailed reviews will allow a mitigation strategy specific to each identified feature to be developed, and thus potential for cumulative impacts to be better understood.

Operation and Maintenance

Tier 1 Projects

7.11.11 Impacts from the Celtic Interconnector and White Cross Floating Offshore Windfarm have the potential to impact on the same marine archaeology and cultural heritage receptors where the developments overlap, cross or run adjacent. The impacts would be direct, through impacts from penetration or compression during maintenance activities, and indirect, as a result of geomorphological changes from sea bed disturbance. The significance of effect would be dependent on the type of receptor impacted and the type of impact.

7.11.12 The significance of any cumulative assessment with Tier 1 projects will be presented at ES stage, following identification of features of archaeological interest, (detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing). The detailed reviews will allow a mitigation strategy specific to each identified feature to be developed, and thus potential for cumulative impacts to be better understood.

Tier 2 Projects

7.11.13 There are no Type 2 projects expected to cause cumulative effects for marine archaeology and cultural heritage.

Tier 3 Projects

7.11.14 Impacts from The Crown Estate's Celtic Sea Floating Offshore Wind Leasing Round 5 - Project Development Area 3 (PDA3) have the potential to impact on the same marine archaeology and cultural heritage receptors where the developments overlap, cross or run adjacent. The impacts would be direct, through impacts from penetration or compression during maintenance activities, and indirect, as a result of scour from sea bed disturbance. The significance of effect would be dependent on the type of receptor impacted and the type of impact.

7.11.15 The significance of any cumulative assessment with Tier 3 projects will be presented at ES stage, following identification of features of archaeological interest, (detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing). The detailed reviews will allow a mitigation strategy specific to each identified feature to be developed, and thus potential for cumulative impacts to be better understood.

Decommissioning

7.11.16 The potential for any cumulative decommissioning phase effects with other projects is largely dependent on the specific features of archaeological interest. All of the identified projects will have completed their construction phase activities at the time of the Proposed Development’s decommissioning. However, the Proposed Development's final decommissioning plan and the associated environmental appraisals (including supporting EIA or similar) will be undertaken in the final years prior to decommissioning (the Proposed Development’s operational lifetime is anticipated as c.50 years) and this will include review of other plans and projects relevant at that time. The final construction phase

mitigation plan (e.g. final offshore archaeological WSI and mitigation strategy specific to each identified feature) will also be used to inform decommissioning phase mitigation strategies. Given that the footprint of disturbance associated with decommissioning activities would be less than at construction (same seabed but lesser area; c.f. Volume 1, Chapter 3, Project Description of this PEIR) there is confidence that no significant cumulative effects will be associated with the decommissioning phase.

7.12 Transboundary Effects

7.12.1 A screening of transboundary impacts has been carried out and any potential for significant transboundary effects with regard to Marine Archaeology from the Proposed Development upon the interests of other states has been assessed as part of this PEIR. The potential transboundary impacts assessed within Volume 1, Appendix 5.2: Transboundary screening are summarised below.

- Geomorphological change as a result of dredging during pre-lay activities, jetting during cable laying and cable repairs may change the local hydrodynamic and sedimentary processes. This change may cause affected receptors to be exposed to physical or chemical degradation. Disturbance from geomorphological change within the UK EEZ may have an impact on any marine archaeological and cultural heritage receptors within the French EEZ.
- Direct change to receptors located adjacent to or within the immediate boundary of the UK EEZ.

7.12.2 The impacts would be direct, through impacts from penetration or compression during construction and maintenance activities, and indirect, as a result of scour from sea bed disturbance. The significance of effect would be dependent on the type of receptor impacted and the type of impact which is not clear at this time.

7.12.3 The equivalent level of environmental surveys are being undertaken within the French jurisdiction (equivalent to those undertaken in UK waters) i.e. SBP, SSS, Mag and MBES surveys. Detailed archaeological review and geotechnical investigations will also be carried out to identify features of archaeological interest in French waters. The significance of any impact on these features from activities in UK waters will be feature and mitigation strategy specific which are not known at this time.

7.12.4 Given the Proposed Development's commitment to develop archaeological mitigation strategies along the entire Xlinks MUPP length, no residual significant impacts (following mitigation strategies) are anticipated. The provisional conclusions of the Physical Processes PEIR assessment are also noted, which suggest that any pathways change (e.g. sediment mobilisation) that may affect archaeological receptors would be negligible in deep water. The potential for transboundary impacts will be reviewed further at ES stage.

7.13 Inter-related Effects

7.13.1 Inter-relationships are the impacts and associated effects of different aspects of the Proposed Development on the same receptor. These are as follows.

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Proposed Development (construction,

operation and maintenance), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases (e.g., construction noise effects from piling and operational substation noise).

- Receptor led effects: Assessment of the scope for all effects (including inter-relationships between environmental topics) to interact, spatially and temporally, to create inter-related effects on a receptor. Receptor-led effects may be short term, temporary or transient effects, or incorporate longer term effects.

7.13.2 A description of the likely interactive effects arising from the Proposed Development on Marine Archaeology and Cultural Heritage is provided in Volume 4, Chapter 5: Inter-related effects of the PEIR.

7.14 Summary of Impacts, Mitigation Measures and Monitoring

7.14.1 Information on Marine Archaeology and Cultural Heritage within the study area was collected through desktop review and consultation with Historic England.

7.14.2 **Table 7.18** presents a summary of the impacts, measures adopted as part of the Proposed Development and residual effects with respect to Marine Archaeology. The impacts assessed include:

- Direct impact of sediment removal containing undisturbed archaeological contexts during seabed preparation ahead of construction activities leading to the total or partial loss of marine heritage receptors;
- Direct impact by penetration, compression, and disturbance during seabed preparation, laying of cables and laying of rock berm over cable crossings leading to the total or partial loss of marine heritage receptors;
- Direct impact by penetration, compression, and disturbance effects of jack-up barges and anchoring of construction vessels during construction activities leading to total or partial loss of marine heritage receptors
- Indirect impacts upon known and potential marine archaeological receptors as a result of changes to sedimentation and erosion patterns;
- Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities;
- Direct impact by penetration, compression and disturbance effects of maintenance activities at the cable corridor leading to total or partial loss of marine heritage receptors;
- Direct impact by penetration, compression, and disturbance effects of jack-up barges and anchoring of operation and maintenance vessels during the operation and maintenance phase leading to total or partial loss of marine heritage receptors; and
- Indirect impacts causing disturbance of sediment containing potential marine heritage receptors during maintenance activities leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.

- Indirect impacts causing disturbance of sediment containing potential marine heritage receptors from leaving the cable and cable protection infrastructure *in-situ* leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.
- Direct impacts by penetration, compression and disturbance through removal activities and the anchoring of vessels during the decommissioning phase leading to further degradation of marine heritage receptors.
- Indirect impacts causing disturbance of sediment containing potential marine heritage receptors from removal of the cable and cable protection infrastructure leading to the exposure of those marine heritage receptors to physical, chemical or biological processes and indirectly causing or accelerating their loss.

7.14.3 Based on the information available at PEIR stage, a precautionary conclusion determines several potential significant effects arising from the Proposed Development during the construction, operation and maintenance or decommissioning phases. The ongoing geophysical reviews and the development of feature specific mitigation strategies will likely moderate any impacts to an acceptable level. The final assessment provided within the ES will include full details.

7.14.4 The assessment of cumulative impacts will be presented at ES stage, following identification of features of archaeological interest, (detailed archaeological review of the site-specific SBP, SSS, Mag and MBES surveys and the geotechnical investigations is ongoing). The detailed reviews will allow a mitigation strategy specific to each identified feature to be developed, and thus potential for cumulative impacts to be better understood.

7.14.5 Overall, it is concluded that there is the potential for significant cumulative effects from the Proposed Development alongside other projects/plans but at the PEIR stage the specific receptors impacted cannot be determined due to insufficient baseline information.

7.14.6 The following potential transboundary impacts has been identified in regard to effects of the Proposed Development (PEIR stage):

- Geomorphological change as a result of dredging during pre-lay activities, jetting during cable laying and cable repairs may change the local hydrodynamic and sedimentary processes.
- Change to receptors located within the immediate boundary of the UK EEZ.

Table 7.18 Summary of potential environmental effects

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Construction phase							
Palaeolandscape feature remains	High	Truncation, removal or disturbance of remains as a result of seabed preparation, or	Long term	Low Adverse	Moderate or minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact upon potential marine archaeological	Long term	Low Beneficial	Moderate or Minor Beneficial	Significant	Further characterisation

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		receptors as a result of discovery during pre-construction assessment and construction activities					of features and mitigation development will inform the final (ES) assessment.
Sub-seabed deposits of palaeoenvironmental interest	High	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Low Beneficial	Moderate or Minor Beneficial	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Prehistoric occupation sites	High	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
							of features and mitigation development will inform the final (ES) assessment.
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Wooden shipwreck remains	High	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
							inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Iron shipwreck remains	High	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
							(ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Steel shipwreck remains	Medium	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Low Adverse	Minor Adverse	Not Significant	
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Aviation wreck remains	High	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Maritime occupation or utilisation activity remains	Medium	Truncation, removal or disturbance of remains as a result of seabed preparation	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Truncation, removal or disturbance of remains as a result of construction activities	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Low Adverse	Minor Adverse	Not Significant	
		Indirect impact upon potential marine archaeological receptors as a result of discovery during pre-construction assessment and construction activities	Long term	Low Adverse	Minor Adverse	Not Significant	
Operational phase							

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Palaeolandscape feature remains	High	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Sub-seabed deposits of palaeo-environmental interest	High	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Prehistoric occupation sites	High	Truncation, removal or disturbance of remains as a	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		result of maintenance activities					development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Wooden shipwreck remains	High	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Iron shipwreck remains	High	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Steel shipwreck remains	Medium	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Low Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor or Negligible Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Aviation wreck remains	High	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Maritime occupation or utilisation activity remains	Medium	Truncation, removal or disturbance of remains as a result of maintenance activities	Long term	Low Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring	Long term	Negligible Adverse	Minor or Negligible Adverse	Not Significant	
		Indirect impact from geomorphological changes	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
							mitigation development will inform the final (ES) assessment.
Decommissioning phase							
Palaeolandscape feature remains	High	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Sub-seabed deposits of palaeoenvironmental interest	High	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
							inform the final (ES) assessment.
Prehistoric occupation sites	High	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Wooden shipwreck remains	High	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a	Long term	Negligible Adverse	Minor Adverse	Not Significant	

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		result of anchoring and cable removal					
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Iron shipwreck remains	High	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Negligible Adverse	Minor Adverse	Not Significant	
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Steel shipwreck remains	Medium	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Low Adverse	Minor Adverse	Not Significant	

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Negligible Adverse	Minor or Negligible Adverse	Not Significant	
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
Aviation wreck remains	High	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Low Adverse	Moderate or Minor Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Medium Adverse	Major or Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
							(ES) assessment.
Maritime occupation or utilisation activity remains	Medium	Indirect impact from geomorphological changes as a result of leaving cable *in-situ*	Long term	Low Adverse	Minor Adverse	Not Significant	
		Compression, penetration or disturbance of remains as a result of anchoring and cable removal	Long term	Negligible Adverse	Minor or Negligible Adverse	Not Significant	
		Indirect impact from geomorphological changes as a result of removing cable	Long term	Medium Adverse	Moderate Adverse	Significant	Further characterisation of features and mitigation development will inform the final (ES) assessment.

7.15 Next Steps

7.15.1 The results of the ongoing archaeological analysis of the completed site-specific surveys and geotechnical investigation will be incorporated into the baseline for the marine archaeology and cultural heritage ES chapter to better understand the nature of the underlying deposits, the potential for archaeological remains from all periods and the significance of effect on impacted receptors. The results will allow more precise micro-routing incorporating identified Archaeological exclusion zones (AEZs) around affected receptors where applicable.

7.15.2 A mitigation strategy to address affected receptors, where AEZs are not applicable or where unexpected receptors are identified during site preparation or construction activities, will be determined through consultation with Historic England and set out as part of the draft Offshore Outline Archaeological WSI, appended to the PEIR, and the finalised Offshore Outline Archaeological WSI which will be appended to the ES chapter.

7.16 References

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