Preliminary Environmental Information Report Volume 2

Appendix 26.1 Marine Archaeological Technical Report

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LIONLINK

LionLink

Marine Archaeological Technical Report

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wessexarchaeology

Portway House
Old Sarum Park
Salisbury
Wiltshire
SP4 6EB

www.wessexarch.co.uk

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Project management by	Andrea Hamel
Document compiled by	Stephane Said, Dr Beccy Scott, Laura Andrews, David Howell & Verity Landrock
Contributions from	Hayley Hawkins, Sophie Thorogood, Ciaran Martindale, Iona Cargill & Harry McDade
Graphics by	Kitty Foster

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Summary

Wessex Archaeology was commissioned by Collaborative Environmental Advisers (CEA) to prepare a marine archaeological technical report for the United Kingdom marine component of the proposed LionLink electricity interconnector. The marine elements of the Proposed Scheme (defined as the part of the Project within the British jurisdiction) extends from landfall at Walberswick in Suffolk, across the Southern North Sea to the boundary between the UK and Netherlands Exclusive Economic Zone and are referred to hence with as the Proposed Offshore Scheme.

This document comprises a desk-based assessment of documentary sources and a technical assessment of marine geophysical and geotechnical datasets to describe the marine archaeological baseline in the study area. The aim of the document is to assess the known and potential marine archaeological resource within the study area, as represented by the extent of the area defined by the Draft Order Limits, comprising approximately 182km cable length and a cable corridor that is approximately 500m in width. This informs the assessment for marine archaeology within the Preliminary Environmental Information Report.

Within the marine archaeology technical report study area, the following features have been identified:

- 13 shallow geological units of varying archaeological potential, comprising Pleistocene sediments characteristic of the Yarmouth Roads Formation, the Eem Formation, and the Lower and Upper Brown Bank Formations, overlain by units not correlated to any known geological formation, including fluvial sands and gravels and alluvial sands, peat, organic interbedded sands and head, derived from geoarchaeological and geophysical data;
- 66 individual features of palaeogeographic interest, including 27 P1 archaeological features (feature of probable archaeological interest, either because of its palaeogeography or likelihood for producing palaeoenvironmental material) consisting mainly of buried palaeochannels, high amplitude reflectors/organic layers, and banks, and 39 P2 archaeological features (features of possible archaeological interest), consisting mainly cut and fills and areas of acoustic blanking;
- a total of 289 seabed anomalies of possible archaeological interest, including 26 A2_h anomalies (anomalies of likely anthropogenic origin but of unknown date; may be of archaeological interest of a modern feature), 260 A2_l anomalies (anomalies of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature), and three A3 historic records (historic record of possible archaeological interest with no corresponding geophysical anomaly);
- a further 36 recorded wrecks and obstructions not covered by geophysical survey datasets;
- potential for the discovery of shipwreck material from the late Mesolithic to the present; and
- potential for the discovery of 20th century aircraft material, particularly from the Second World War.

Acknowledgements

This project was commissioned by CEA Ltd on behalf of National Grid LionLink Limited.

Data was provided by the United Kingdom Hydrographic Office (UKHO), the National Record of the Historic Environment (NRHE), and the Suffolk County Council (HER). Wessex Archaeology is grateful to the staff of all the above organisations for their assistance during the project.

LionLink

Marine Archaeological Technical Report

1 INTRODUCTION

1.1 Project Background

1.1.1 Wessex Archaeology was commissioned by Collaborative Environmental Advisers (CEA) to undertake the marine archaeological assessments required to support the application for the United Kingdom (UK) marine component of the proposed LionLink electricity interconnector. The marine elements of the Proposed Scheme (defined as the part of the Project within the British jurisdiction) extends from landfall at Walberswick in Suffolk, across the Southern North Sea to the boundary between the UK and Netherlands Exclusive Economic Zone (EEZ) and is referred to as the Proposed Offshore Scheme. This report is prepared in support of the Preliminary Environmental Information Report (PEIR) for the Proposed Offshore Scheme.

1.1.1 This report comprises a marine archaeological baseline study of the Proposed Offshore Scheme, based on an archaeological assessment of geophysical and geotechnical data, gathered as part of the marine characterisation survey, together with a review of records held by national and local inventories and secondary sources relating to the marine historic environment of the region. This archaeological baseline also includes an assessment of the value and sensitivity of any identified marine archaeological assets within the Proposed Offshore Scheme. An assessment of the seascape character has also been undertaken.

1.2 Development Proposal

1.2.1 The Proposed Offshore Scheme comprises the installation of offshore submarine High Voltage Direct Current (HVDC) cables between landfall at Walberswick and the UK EEZ. The Proposed Offshore Scheme is delimited by the Mean High Water Springs (MHWS) at the landfall and the boundary of the UK EEZ (**Figure 1**). The Proposed Offshore Scheme will encompass the submarine electricity cables from the proposed Landfall Site at Walberswick to the EEZ boundary at sea.

1.2.2 At the proposed Landfall Site, a trenchless solution such as Horizontally Directional Drilling (HDD) will be utilised for landing the submarine cable, with the HDD ‘punch-out’ (exit the seabed) between the 5m and 9m lowest astronomical tide (LAT) water depth contours.

1.3 Previous Impact

1.3.1 There are already a considerable number of existing marine developments located in proximity to the Proposed Offshore Scheme, including East Anglia One North, Norfolk Vanguard West and Norfolk Boreas offshore wind farms. The Proposed Offshore Scheme will also intersect or run close to export cable routes, including Norfolk Vanguard East and East Anglia One North, and a number of telecom cables. There are also several marine aggregate licence areas located within some distance to the Proposed Offshore Scheme. (**Volume 1 Chapter 25 Other Marine Users**).

1.4 Scope of Document

1.4.1 The purpose of this assessment is to determine, as far as is possible from existing information and bespoke survey data, the nature, extent and significance of the known and potential marine archaeological resource within the boundary of the Proposed Offshore Scheme.

1.5 Aims

1.5.1 The specific aim of this marine archaeological technical report is to summarise the known and potential archaeological baseline within the Proposed Offshore Scheme to subsequently inform the PEIR.

1.5.2 The objectives of the assessment are as follows:

- to provide details of relevant legislation, national and local planning policy, and best practice guidance;
- to assess the geophysical survey datasets acquired by Next Geosolutions in order to identify any sites and material of possible archaeological and cultural heritage significance present within the Proposed Offshore Scheme. This included:
  - identify any buried palaeolandscape features of possible archaeological potential;
  - confirm the presence of known or previously located marine sites of archaeological potential and to comment on their apparent character;
  - identify, locate and characterise hitherto unrecorded marine sites of archaeological potential; and
  - comment on the effects of development on known archaeological sites.
- to review geotechnical logs (224 vibrocores) to identify sediments of potential archaeological interest and assess alongside the sub-bottom profiler (SBP) data;
- to compare the geophysical and geotechnical interpretation with desk-based assessments, historical data, known archaeological sites and previous investigations in the vicinity of the Proposed Offshore Scheme to outline the known and potential marine archaeological resource;
- to summarise the Historic Seascape Character for the area that the Proposed Offshore Scheme truncates;
- to assess the significance of the known and potential marine archaeological resource through weighted consideration of their valued components; and
- to recommend mitigation measures for any potential archaeological or cultural heritage assets newly identified within the Proposed Offshore Scheme, including the addition of new Archaeological Exclusion Zones (AEZs) where necessary within the Proposed Offshore Scheme.

1.6 Copyright

1.6.1 This report may contain material that is non-Wessex Archaeology copyright (e.g. Ordnance Survey, British Geological Survey (BGS), Crown Copyright), or the intellectual property of

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2 LEGISLATION, GUIDANCE AND POLICY

2.1 Introduction

2.1.1 The Proposed Offshore Scheme extends through English Territorial Waters, up to 12 nautical miles (NM) from the coast, out to the UK EEZ.

2.1.2 The archaeological curator responsible for the offshore archaeological resource, from MHWS to the 12 NM limit is the Historic England Marine Planning Unit, with specialist advice provided by the Historic England East of England Science Advisor, with regard to activities undertaken as part of the Proposed Offshore Scheme.

2.1.3 The following section provides a summary of the national, regional and local planning and legislative framework that governs the treatment of the marine historic environment in the planning process. More comprehensive details are provided in **Appendix 2** of this document.

2.1.4 Details regarding terrestrial legislation, in particular, the Planning Act 2008, and other relevant onshore guidance and policy are presented in the onshore archaeological desk-based assessment for the Proposed Scheme.

2.2 Marine Legislation

2.2.1 The following legislation applies to marine heritage within the Proposed Offshore Scheme:

- Marine and Coastal Access Act 2009;
- Protection of Wrecks Act 1973: Section One and Two;
- Ancient Monuments and Archaeological Areas Act 1979 (as amended);
- Protection of Military Remains Act 1986; and
- Merchant Shipping Act 1995.

2.2.2 The above legislation provides a context for focussing approaches and consultation requirements. These legal frameworks provide protection for marine historic assets of high historical, archaeological or artistic value, as well as allowing military wrecks and aircraft remains to be protected. Ownership of any wreck remains is determined in accordance with the Merchant Shipping Act 1995 as administered by the Receiver of Wreck.

2.3 International Conventions

2.3.1 The UNESCO Convention was concluded in 2001 and is a comprehensive attempt to codify the law internationally with regards to underwater archaeological heritage. The UK (including the Bailiwick of Guernsey) abstained in the vote on the final draft of the Convention, however, it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the Convention entered into force on 02 January 2009 having been signed or ratified by 20 member states. To date, the Convention has been ratified by 71 countries.

2.3.2 The Annex of the convention suggests preservation *in situ* as best archaeological practice.

2.4 National Planning Policy Framework

2.4.1 The National Planning Policy Framework (NPPF) was first published by the Department for Communities and Local Government in March 2012, replacing Planning Policy Statement 5. The most recent revision of the NPPF, published by the Ministry of Housing, Communities & Local Government was released in December 2024 (HM Government, 2024).

2.4.2 Section 16 of the NPPF, *Conserving and enhancing the historic environment*, sets out the principal national guidance on the importance, management and safeguarding of heritage assets within the planning process. The aim of this section is to ensure that Regional Planning Bodies and 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.

2.4.3 The government guidance provides a framework that:

- recognises that heritage assets are an irreplaceable resource;
- requires applicants to provide proportionate information on the significance of heritage assets affected by the proposals and an assessment of the proposals on that significance;
- takes into account the desirability of sustaining and enhancing the significance of heritage assets and their setting;
- places weight on the conservation of designated heritage assets;
- 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; and
- promotes the conservation of heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations.

2.5 Marine Policy

2.5.1 The Marine and Coastal Access Act 2009 is the primary legislation relevant to marine development plans. Under this legislation, marine plans must be consistent with the UK Marine Policy Statement (MPS) (HM Government, 2011) and fully reflect the requirements

of the MPS at a local level. Marine plans must also be in accordance with other UK national policy, including the NPPF.

2.5.2 The MPS was prepared and adopted by HM Government and the devolved administrations of Scotland, Wales and Northern Ireland for the purposes of Section 44 of the Marine and Coastal Access Act 2009. Under the Act, the UK was divided into marine planning regions, with an associated planning authority responsible for preparing a marine plan for that area.

2.5.3 The MPS sets out the framework for preparing Marine Plans (see below) and taking decisions affecting the marine environment and was jointly adopted by the Secretary of State, Scottish Ministers, Welsh Ministers and the Department of the Environment in Northern Ireland in 2011.

2.5.4 The UK MPS notes that “marine activities have the potential to result in adverse effects on the historic environment both directly and indirectly, including damage to or destruction of heritage assets” (HM Government, 2011: 22).

2.5.5 It sets out for consideration that:

- some heritage assets have a level of interest that justifies statutory designation, the purpose of which is to ensure that they are protected and conserved for the benefit of this and future generations;
- many heritage assets with archaeological interest in these areas are not currently designated as scheduled monuments or protected wreck sites but are demonstrably of equivalent significance. The absence of designation for such assets does not necessarily indicate lower significance and the marine plan authority should consider them subject to the same policy principles as designated heritage assets;
- in considering the significance of heritage assets and their setting, the marine plan authority should take into account the particular nature of the interest in the assets and the value they hold for this and future generations;
- where the loss of the whole or a material part of a heritage asset’s significance is justified, the marine plan authority should identify and require suitable mitigating actions to record and advance understanding of the significance of the heritage asset before it is lost. Requirements should be based on advice from the relevant regulator and advisors; and
- in England, marine licensing and marine planning was made the responsibility of the Marine Management Organisation.

2.6 Marine Plans

2.6.1 The Proposed Offshore Scheme is located within the East Inshore and East Offshore Marine Plan.

2.6.2 The East Inshore and East Offshore Marine Plans were published in one document in April 2014 (HM Government, 2014). The East Inshore Marine plan includes the coastline stretching from Flamborough Head to Felixstowe, covering an area of 6000 square km and extends seaward to the limit of the UK territorial waters (12 NM). The East Offshore Marine Plan extends from the seaward limit of the territorial sea out to the boundary of the EEZ. This includes maritime borders with the Netherlands, Belgium and France.

2.6.3 With regards to heritage assets and seascape, objective 5 of the plan is "to conserve heritage assets, nationally protected landscapes and ensure that decisions consider the seascape of the local area" (HM Government, 2014: 50). Furthermore, policy SOC2 of the Marine Plan details the requirements that should be demonstrated for proposals that may affect heritage assets, as follows:

- *that they will not compromise or harm elements which contribute to the significance of the heritage asset;*
- *how, if there is compromise or harm to a heritage asset, this will be minimised;*
- *how, where compromise or harm to a heritage asset cannot be minimised it will be mitigated against; and*
- *the public benefits for proceeding with the proposal if it is not possible to minimise or mitigate compromise or harm to the heritage asset.*

2.6.4 Additionally, Policy SOC3 details the requirements that should be demonstrated for proposals that may affect terrestrial and marine character of an area:

- *that they will not adversely impact the terrestrial and marine character of an area.*
- *how, if there are adverse impacts on the terrestrial and marine character of an area, they will minimise them.*
- *how, where these adverse impacts on the terrestrial and marine character of an area cannot be minimised they will be mitigated against.*
- *the case for proceeding with the proposal if it is not possible to minimise or mitigate the adverse impacts.*

2.7 County Council Plans

2.7.1 East Suffolk District Council Coastal Local Plan was adopted in September 2020 (HM Government, 2020), providing a guidance and delivers the Council's plans and aspirations for growth, as desired by the Council and community, and for the delivery of development projects and infrastructure.

2.7.2 The Suffolk Coastal Local Plan area has a rich and varied built and historic environment with significant heritage assets alongside contemporary developments.

2.7.3 Policy SCLP11.3: Historic Environment states that the “Council will work with partners, developers and the community to conserve and enhance the historic environment and to ensure that where possible development makes a positive contribution to the historic environment”.

2.7.4 Furthermore, “all development proposals which have the potential to impact on heritage assets or their settings should be supported by a Heritage Impact Assessment and / or an Archaeological Assessment prepared by an individual with relevant expertise. Pre-application consultation with the Council is encouraged to ensure the scope and detail of a Heritage Impact Assessment or Archaeological Assessment is sufficient. The level of detail of a Heritage Impact Assessment should be proportionate to the scheme proposed and the number and significance of heritage assets affected”.

2.7.5 Policy SCLP11.7: Archaeology, highlights that "an archaeological assessment proportionate to the potential and significance of remains must be included with any planning applications affecting areas of known or suspected archaeological importance to ensure that provision is made for the preservation of important archaeological remains.

2.7.6 Where proposal affecting archaeological sites, preference will be given to preservation in situ unless it can be shown that recording of remains, assessment, analysis report and / or deposition of the archive is more appropriate.

2.7.7 Archaeological conditions or planning obligations will be imposed on consents as appropriate. Measures to disseminate and promote information about archaeological assets to the public will be supported". (HM Government, 2020: 194).

2.8 Marine Guidance

2.8.1 This assessment was carried out in a manner consistent with available best practice and guidance for offshore development. Guidance relating specifically to subsea cable projects does not currently exists, however, since cable routes are an integral part of offshore wind development, the guidance below relating to renewable energy and offshore wind farm projects will be utilised for the purposes of this assessment. The principal sources are described in chronological order of issue:

- *Military Aircraft Crash Sites: Guidance on their significance and future management* (English Heritage (now Historic England), 2002);
- *The Code of Practice for Seabed Developers* (Joint Nautical Archaeology Policy Committee and The Crown Estate, 2006);
- *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (English Heritage (now Historic England), 2008);
- *Our Seas – a shared resource. High level marine objectives* (Department for Environment, Food and Rural Affairs (DEFRA), 2009);
- *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (second edition) (English Heritage (now Historic England), 2011);
- *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector* (Gribble & Leather, 2011);
- *Ships and Boats: Prehistory to Present: Designation Selection Guide* (English Heritage (now Historic England), 2012);
- *Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes* (English Heritage (now Historic England), 2013);
- *Managing Significance in Decision-Taking in the Historic Environment Historic Environment Good Practice Advice in Planning: 2* (English Heritage (now Historic England), 2015a);
- *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record* (Historic England), 2015);

- *Preserving Archaeological Remains: Decision-taking for Sites under Development* (Historic England, 2016a);
- *Ships and Boats: Prehistory to 1840. Introduction to Heritage Assets* (Historic England, 2016b);
- *Ships and Boats: 1840-1950. Introduction to Heritage Assets* (Historic England, 2016c);
- *The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning: 3* (Second Edition) (Historic England, 2017);
- *Statements of Heritage Significance: Analysing Significance in Heritage Assets: Historic England Advice Note 12* (Historic England, 2019);
- *Deposit Modelling and Archaeology Guidance for Mapping Buried Deposits* (Historic England, 2020);
- *Standard and guidance for historic environment desk-based assessment* (CIfA, 2014a, updated 2020);
- *Standard and guidance for archaeological advice by historic environment services* (CIfA, 2014b, updated 2020);
- *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (The Crown Estate, 2021);
- *Code of Conduct: Professional Ethics in Archaeology* (CIfA, 2014c, updated 2022); and
- *Curating the Palaeolithic* (Historic England, 2023).

3 METHODOLOGY

3.1 Study Area

3.1.1 The boundary of the study area defines the area where any potential impact on marine archaeology receptors may occur. The area assessed in this report is defined by the extent of the Draft Order Limit as provided by the Client, consisting of a 500m wide survey corridor, and an additional 1 km buffer area around the extents of the Proposed Offshore Scheme Draft Order Limit, up to MHWS (**Figure 1**).

3.1.2 The assessment of marine geophysical survey data is defined by the extents of the data supplied and falls within the Draft Order Limits (**Figure 1**). The data were acquired over a 500m wide corridor, centred on an indicative centreline for the cable route, and collected as separate blocks of data. The 'intertidal' survey and Block 4 comprise the 'nearshore' and Blocks 5-19 comprise the 'offshore' data sets.

3.1.3 At the proposed Landfall Site, the study area includes a 500 m buffer beyond the MHWS mark as shown in **Figure 11** and **Figure 12**. The marine study area overlaps with the terrestrial historic environment study area between the MHWS and Mean Low Water Springs (MLWS) marks.

3.2 Search Area

3.2.1 A wider search area comprising a 2 km buffer around the extents of the Proposed Offshore Scheme was used for obtaining records from relevant archive databases. This wider search area allows for a greater understanding of the broader archaeological baseline environment, with the dual purpose of enabling any archaeological trends within the region to be recognised and to allow any heritage assets identified to be represented in a broader archaeological context.

3.2.2 All data for heritage assets located within this search area are stored on the Wessex Archaeology archive network and can be made available on request.

3.3 Intertidal / Foreshore Landfall Site

3.3.1 No intertidal walkover survey covering the area between MLWS and MHWS will be undertaken as HDD will be utilised, and no surface intrusive works are planned. However, a MagDrone survey is proposed to be carried out covering the area between Proposed Onshore Scheme and Proposed Offshore Scheme to inform activities being undertaken at the proposed Landfall Site. The methodology and results for the archaeological assessment of the survey data for this survey will be included in the ES.

3.4 Archaeological Desk-Based Assessment

Key Themes

3.4.1 The methodology follows the best practice professional guidance outlined by the Chartered Institute for Archaeologists' (CIfA) *Standard and guidance for historic environment desk-based assessment* (2014a, updated 2020).

3.4.2 The marine themes relevant to marine archaeological baseline as assessed in this report are:

- palaeogeography (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts such as handaxes) including their setting and value;
- seabed features including:
  - maritime sites (such as shipwrecks and associated material including cargo, obstructions and fishermen's fasteners) including their setting and value; and
  - aviation sites (aircraft crash sites and associated debris) including their setting and value;
- intertidal features relating to marine activity, for example fish traps, piers, sea defences located within the intertidal zone between MHWS and MLWS marks; and
- the historic seascape character in and around the study area.

3.4.3 The types of archaeology listed above relate to the known marine resource and also the currently unknown resource. There is potential for the presence of palaeogeographic material dating from the Palaeolithic onwards. There is also potential for discoveries of maritime craft from the Mesolithic to the modern period. Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by the United Kingdom Hydrographic Office and others and thus recorded in the archaeological record. However, there is still potential for

the discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey.

3.4.4 There is also potential for 20th century aircraft, particularly in relation to the Second World War (Wessex Archaeology, 2008a). Aircraft crash sites are also difficult to identify through archaeological assessments of geophysical survey, although experience indicates material from the site, such as engines or other material may be recorded as small obstructions or anomalies.

Data Sources

3.4.5 Baseline conditions have been established by undertaking a desktop review of published information and through consultation with relevant organisations. The data sources used to inform the baseline description and assessment include:

- geophysical survey datasets acquired by Next Geosolutions (hereafter NextGeo) in 2024 and associated survey and operations reports (NextGeo 2024a-b, 2025);
- geotechnical data including 224 vibrocores collected by NextGeo in September 2024;
- United Kingdom Hydrographic Office (UKHO) data for charted wrecks and obstructions (received July 2024);
- National Marine Heritage Record (NMHR) maintained by Historic England, comprising data for terrestrial and marine archaeological sites, find spots and archaeological events (received August 2024);
- Historic Environment Records (HERs) results for Suffolk (received September 2024), comprising databases of their recorded archaeological sites, findspots, and archaeological events;
- National Heritage List for England maintained by Historic England, comprising data of designated heritage assets including sites protected under the Protection of Military Remains Act 1986 and the Protection of Wrecks Act 1973;
- Rapid Field Survey of the Suffolk Coast and Intertidal Zone carried out by Suffolk C.C. Archaeological Service (2003);
- Coastal and Intertidal Zone Archaeological Network (CITiZAN) for coastal archaeological findspots and sites;
- datasets comprising the Historic Seascape Characterisation (HSC) using the consolidated HSC national database (LUC, 2017);
- relevant mapping including Admiralty Charts, British Geological Survey (BGS), Ordnance Survey and historic maps; and
- relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeology Data Service and other websites (presented in the 'References').

Data Structure

3.4.6 This report is supported by a Geographic Information System (GIS) using ArcGIS Pro 3.4.0, incorporating the positional information of the various data sources listed above, allowing the data to be spatially analysed. The data were subsequently compiled into gazetteers of the prehistoric, maritime and aviation, and intertidal resources within the study area; these were used to inform the assessment of geophysical and geotechnical data.

3.4.7 Within this assessment, the gazetteers for the marine and intertidal datasets and geophysical survey data, are compiled and presented in Universal Transverse Mercator (UTM) Zone 31 North projected from a European Terrestrial Reference System (ETRS) 1989 datum.

3.4.8 Information relating to the marine heritage that did not include location or positional information were also used to inform the marine archaeological baseline assessment where relevant.

Chronology

3.4.9 Archaeological material is generally studied within a framework of 'periods' or 'ages' that reflect the activities and cultural changes taking place over time. All dates are referred to as BCE (Before Common Era), BP (Before Present) or AD (Anno Domini) within the text. BCE refers to calibrated radiocarbon chronology that can be considered equivalent to calendar years. BP dates are used for periods of time older than circa 10,000 years ago.

3.4.10 A list of the main archaeological periods of the British Isles referred to in the text, along with their broadly defined dates, are presented in **Appendix 1** of this document, which reflects the archaeological record documented from coastal and marine contexts.

Palaeogeography

3.4.11 The baseline summary for seabed prehistory was based on a review of geological mapping of seabed sediments, solid geology and bathymetry from published BGS sources, as well as previous assessments undertaken in the region containing the study area. This has been enhanced by the assessment of geophysical survey data and geoarchaeological review of geotechnical data undertaken for 224 vibrocores, used to produce a stratigraphic framework for understanding the geoarchaeological and archaeological potential within the area investigated.

3.4.12 The results of the geoarchaeological review of the geotechnical data is presented in a standalone report – *LionLink Stage 1 Geoarchaeological Review of 2024 Offshore Geotechnical Data* (Wessex Archaeology, 2025). A summary of the geoarchaeological baseline and assessment is presented in **Section 4**.

Seabed Features: Maritime and Aviation Sites

3.4.13 The baseline summary for maritime and aviation archaeology was assessed by means of accessing any records of sites, findspots, wrecks, casualties and other seabed features obtained from the UKHO, NMHR and local HERs located within the study area. Results from the geophysical survey data have also been incorporated to complement this data forming several discrete gazetteers.

3.4.14 The baseline assessment of maritime and aviation archaeology was further supplemented by a review of relevant primary and secondary source material to provide an indication on the nature of maritime and aviation activity across the region. As well as summarising the

known archaeological resource, the baseline assessment underlines the potential for encountering unknown shipwreck and aircraft crash sites within the study area.

3.4.15 Data relating to Recorded Losses were also extracted from the NMHR and HER data sources. Recorded Losses are records for ships or aircraft that are known to have wrecked or crashed offshore, but for which the exact locations are not known. Recorded Losses are often grouped by area into Maritime Named Locations. For example, a Recorded Loss within this dataset may be based on the loss of a vessel off the coast at 'Southwold' or associated with a known navigational hazard such as a sand bank or rocks (which may give rise to a falsely precise geographic coordinate for the record). The positional data of these records is unreliable and serves only to provide an indication of the types of vessels that passed through the area and the wrecking incidents that are known to have occurred in the general region. Whilst the remains of these vessels and aircraft are expected to exist somewhere on the seafloor, their location is unknown.

3.4.16 Details regarding Recorded Losses, whose Named Locations happen to intersect with the study area, are presented in a gazetteer format (**Appendix 6** and **Appendix 7** of this document). These records have retained their original identification assigned by the NMHR and / or HER for ease of cross-referencing. The gazetteer does not include positional data due to the inaccuracies therein and, as they signify the potential maritime and aviation resource, they are not presented on a figure.

Intertidal Heritage Assets

3.4.17 The baseline summary of intertidal heritage assets located within the extent of the Proposed Offshore Scheme, up to MHWS, was assessed from NMHR, Suffolk HER and CITiZAN datasets to compile into a gazetteer (see **Appendix 8**).

3.4.18 A full assessment of terrestrial historic environment and cultural heritage will be presented in the corresponding document: **Volume 1, Chapter 11 Historic Environment**. However, the marine study area overlaps with the terrestrial historic environment study area providing adequate coverage for the potential of historic environment and cultural heritage within the study area. The baseline summary of the onshore historic environment was assessed from NMHR and Suffolk HER datasets to compile into a gazetteer (see **Section 7**). These records have retained their original identification assigned by the NMHR and / or HER for ease of cross-referencing. The baseline characteristics will be supplemented by the results of the MagDrone survey, which will be presented in the ES.

Historic Seascape Characterisation

3.4.19 In accordance with the European Landscape Convention, 'landscape' can be defined as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Council of Europe, 2000). The term 'seascape' can be defined as a subset of 'landscape', and has "an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land and sea, by natural and/or human factors" (Council of Europe, 2000).

3.4.20 Seascape assessment reflects the holistic approach to landscape of the European Landscape Convention, extending it to the sea. Seascape Character Areas include coastal land, intertidal and marine environments and cover the offshore environment to the territorial limit (12 nm). Historic Seascape Character (HSC) assessment is the identification and interpretation of the historic dimension of the present day coastal and marine environment (Historic England, 2023b).

3.4.21 The baseline summary for character of the historic seascape within the study area was assessed using the compiled results of LUC's Historic Seascape Characterisation: Consolidating the National HSC Database (LUC, 2017).

3.5 Geophysical Survey Methodology

Technical Specifications

3.5.1 The geophysical data were acquired by NextGeo during May 2024 onboard two separate survey vessels comprising sub-bottom profiler (SBP), sidescan sonar (SSS), magnetometer (Mag.), and multibeam echosounder (MBES) data sets.

3.5.2 The NextGeo survey vessel *SHORE Presence* collected the data from the nearshore (covering the intertidal and Block 4) and acquired data across Block 5 (part of the offshore data sets). The MPSV *Ioveli Amber,* operated under NextGeo, collected the remainder of the offshore data sets (see **Section 3.1.2**).

3.5.3 The intertidal data were acquired in main lines aligned north-east to south-west with a line spacing of approximately 15m. The nearshore data sets (Blocks 4 and 5) were acquired with mainlines run parallel to the centre line at a line spacing of 30m and with cross lines every 500m. The offshore data sets were acquired with mainline run parallel to the centre line at a line spacing of approximately 50m and with cross lines every 500m.

3.5.4 Further details on the equipment used is in **Table 1**.

Table 1 Summary of survey equipment

Survey Company	Survey Vessel	Data Type	Equipment	Data Format
NextGeo	*SHORE Presence*	SBP	Standard Innomar SES-2000; Portside sidemount	*.sgy*
		MBES	Singlehead R2Sonic 2024 (portside sidemount)	*TIFF, .xyz*
		SSS	Edgetech 4205 dual frequency (300/900 kHz) ; Towed from Aframe	*.xtf,* mosaic Geotiffs
		Mag.	Geometrics G882 Marine Magnetometer (piggy-backed to SSS)	*.csv, .txt*
		Positioning	Septentrio Asterx-U Marine using Fugro Marinestar Corrections	N/A
Marnavi SpA under control of NextGeo	MPSV *Ievoli Amber*	SBP	Innomar SES-2000 Standard ; Gondola mounted	*.sgy*
		MBES	Gondola-mounted Singlehead R2Sonic 2026	*TIFF, .xyz*
		SSS	Edgetech 4200 dual frequency (300/600 kHz)	*.xtf,* mosaic Geotiffs
		Mag.	Edgetech 4200 dual frequency (300/600 kHz)	*.csv, .txt*
		Positioning	C-Nav 3050 with C-NAV SF2 Correction Signal C-NAV C-Monitor QA/QC System	N/A

Processing

3.5.5 A number of datasets were assessed over the study area, each dataset was processed separately using the following software (**Table 2**).

Table 2 Software used for geophysical assessment

Dataset	Processing Software	Interpretation and rationalisation
SBP	CodaOctopus Survey Engine v9.5	ArcGIS Pro v3.4.2
MBES	QPS Fledermaus v8.6	
SSS mosaic	ArcGIS Pro v3.4.2	
SSS	CodaOctopus Survey Engine v9.5	
Mag.	Proprietary software	

3.5.6 The SBP and MBES data were used as the primary datasets for the palaeographic assessment and SSS, MBES and Mag. datasets were used for the seabed features assessment.

3.5.7 The SBP data were processed using CodaOctopus Survey Engine Seismic+ software. This software allows the data to be visualised with user selected filters and gain settings in order to optimise the appearance of the data for interpretation. The software then allows an interpretation to be applied to the data by identifying and selecting sedimentary boundaries and shallow geological features that might be of archaeological interest.

3.5.8 The SBP data were interpreted with a two-way travel time (TWTT) along the z-axis. In order to convert from TWTT to depth, the velocity of the seismic waves was estimated to be 1,600m/s. This is a standard estimate for shallow, unconsolidated sediments.

3.5.9 The SBP data can also be used to identify small reflectors, which may indicate buried material such as a wreck site covered by sediment. The position and dimensions of any such objects are noted in a gazetteer, and an image acquired of each anomaly for future reference. It should be noted that anomalies of this type are rare, as the sensors must pass directly over such an object in order to detect an anomaly.

3.5.10 For the SBP assessment, the centre line and two wing lines were initially assessed. Where features of interest were identified, additional lines were then interpreted in order to more accurately map the extents of these features. Both a towed sparker and a parametric sonar were used to acquire the SBP data; due to the higher near surface resolution of the system, only the parametric sonar data were used for this assessment.

3.5.11 The MBES data were analysed to identify any unusual seabed structures that could be shipwrecks or other anthropogenic debris. The data were gridded at 0.5m and analysed using QPS Fledermaus software, which enables a 3-D visualisation of the acquired data and geo-picking of seabed anomalies. The MBES data were also used in the palaeogeographic assessment.

3.5.12 The high frequency SSS data mosaics were provided as .tif files and were assessed using ArcMap. The locations of any features considered to be of archaeological potential were marked, and their position and dimensions recorded in a gazetteer. The extents of larger features were also outlined.

3.5.13 A threshold approach has been used for the assessment of the SSS mosaic. Anomalies picked only from the SSS mosaic were subject to a threshold of over 5m in any one direction and only these merited inclusion in the gazetteer unless they 'grouped' with another data type. Thresholding has been used as the resolution of the SSS mosaic meant it was not possible to distinguish whether it was likely that small dark reflectors below this size could be small pieces of debris or if they were more likely to be natural features. Any smaller

objects seen only in the SSS mosaic that were identified below 5m in length have been discriminated as O5 and have not been included in the gazetteer.

3.5.14 The form, size and / or extent of an anomaly is a guide to its potential to be an anthropogenic feature and therefore of archaeological interest. A single small but prominent anomaly may be part of a much more extensive feature that is largely buried. Similarly, a scatter of minor anomalies may be unrelated individual features, define the edges of a buried but intact feature, or may be all that remains as a result of past impacts from, for example, dredging or fishing. Assessment is made of such groups of anomalies during data interpretation to determine which of these alternatives is the most likely.

3.5.15 The Mag. data were processed using in-house proprietary software in order to identify any discrete magnetic contacts which could represent buried metallic debris or structures such as wrecks.

3.5.16 The software enables both the visualisation of individual lines of data and gridding of data to produce a magnetic anomaly map. The data were first smoothed to try and eliminate any spiking. A trend was then fitted to the resulting data, and the trend values subtracted from the smoothed values. This was carried out to remove natural variations in the data (such as diurnal variation in magnetic field strength and changes in geology). The processed data were then gridded to produce a map of magnetic anomalies, and individual anomalies tagged based on the grid and individual profile lines. Images are taken in a similar process to that of the 'Raw' SSS data.

3.5.17 It should be noted that the magnetometer is a passive sensor, and the effectiveness of the sensor to detect magnetic fluctuations caused by ferrous material decreases with increased distance from the target. As such, only significant ferrous objects (e.g. steel hulled wrecks) will be identified between lines of surveys with relatively large line spacings, such as that used for the Proposed Offshore Scheme, and smaller individual pieces of ferrous debris will not be detected. These smaller items are only likely to be detected when the sensor passes much closer to, or directly over, such objects. Larger numbers of magnetic anomalies are often found during subsequent higher resolution surveys than during initial lower resolution surveys; e.g. a pre-construction Unexploded Ordnance (UXO) survey with a shorter line spacing is likely to find additional anomalies between the more widely spaced survey lines of the currently assessed geophysical survey dataset.

3.5.18 For the purposes of this assessment, any identified magnetic anomalies have been classified depending on their amplitude (nanotesla (nT) as small (5nT to 49nT), medium (50nT to 99nT), large (100nT to 499nT), or very large (>500nT).

3.5.19 Locations of features considered to be possibly of high archaeological potential from the initial geophysical data assessment (SSS mosaics, MBES and Mag. data) and the wreck and obstruction database records were checked in the individual SSS data files. These data are referred to in this report as 'Raw SSS' data to distinguish them from the mosaics (even though some of the .xtf files received may have undergone some processing by NextGeo).

3.5.20 These locations included anything thought to be:

- wreck (including wreck and obstructions database record locations);
- debris fields;

- anything deemed unusual and warranting further investigation due to its archaeological potential during interpretation, or at Quality Control (QC);

- Mag. anomalies over 500nT that are not known to be modern (although there were no anomalies over 500nT identified within these data sets).

3.5.21 The intertidal and nearshore (Block 4) data sets were fully assessed by looking at each line of data. These data, and any locations identified using criteria set out above, were assessed using the individual high frequency .xtf 'raw SSS' data files which were processed using CodaOctopus Survey Engine Sidescan+ software. This allowed the data to be replayed with various gain settings in order to optimise the quality of the images. The data were interpreted for any objects of possible anthropogenic origin. This involves creating a database of anomalies within Coda by tagging individual features of possible archaeological potential, recording their positions and dimensions, and acquiring an image of each anomaly for future reference.

3.5.22 Mosaics were not produced by Wessex Archaeology to assess the quality of the sonar towfish positioning; the provided mosaic tiles were used to finalise all SSS anomaly positioning.

Data Quality

3.5.23 Once processed, the geophysical data sets were individually assessed for quality and their suitability for archaeological purposes and rated using the following criteria (**Table 3**).

Table 3 Criteria for assigning data quality rating

Data quality	Description
Good	Data which are clear and unaffected or only slightly affected by weather conditions, sea state, background noise or data artefacts. Seabed datasets are suitable for the interpretation of upstanding and partially buried wrecks, debris fields, and small individual anomalies. The structure of wrecks is clear, allowing assessments on wreck condition to be made. Subtle reflectors are clear within SBP data. These data provide the highest probability that anomalies of archaeological potential will be identified.
Average	Data which are moderately affected by weather conditions, sea state and noise. Seabed datasets are suitable for the identification of upstanding and partially buried wrecks, the larger elements of debris fields and dispersed sites, and larger individual anomalies. Dispersed and/or partially buried wrecks may be difficult to identify. Interpretation of continuous reflectors in SBP data is problematic. These data are not considered to be detrimentally affected to a significant degree.
Below Average	Data which are affected by weather conditions, sea state and noise to a significant degree. Seabed datasets are suitable for the identification of relatively intact, upstanding wrecks and large individual anomalies. Dispersed and/or partially buried wrecks, or small isolated anomalies may not be clearly resolved. Small palaeogeographic features, or internal structure may not be resolved in SBP data.
Variable	This category contains datasets where the individual lines range in quality. Confidence of interpretation is subsequently likely to vary within the study area.

3.5.24 The quality of the SBP data has been rated as 'Good' using the above criteria, with little environmental or other noise visible in the data. The penetration of the equipment was relatively limited, as is expected from parametric sonar data, but reflections were still clearly visible to more than 5m below seabed (BSB) in areas of soft sediment. The data were considered suitable for archaeological assessment.

3.5.25 The intertidal, nearshore and offshore MBES data were rated as 'Good' using the above criteria. Occasional lines of data have been slightly affected by pitch and roll causing some swathes to be visible in the gridded data, however this has not affected the data to a

significant degree. The resolution of 0.5m allows for archaeological assessment of objects and debris over 0.5m in size. Overall, the data are suitable for archaeological interpretation.

3.5.26 The intertidal, nearshore and offshore SSS mosaic data have been rated as 'Average' using the above criteria table. On many lines, data artefacts relating to electrical noise, the sonar heading, and movement of the sonar fish are visible, which may reduce the ability to identify smaller features on the mosaic or 'stretch' the data resulting in inaccuracies in the measurements of features. There are also some slight positional errors where larger features are visible as offset on overlapping lines. Furthermore, it is possible that smaller features may not be identified in the mosaic assessment, either due to the resolution, or the order in which lines have been layered in the mosaic. However, in general it is possible to identify large, significant features in the data and, as such, the data are considered suitable for this assessment.

3.5.27 The intertidal 'Raw SSS' data were assessed in full and have been rated as 'Variable' using the above criteria table. Some lines of data were affected by the shallow waters meaning that the outer ranges were not fully visible. However, excepting some occasional noise and cable snatching, the data were generally suitable for archaeological assessment.

3.5.28 The nearshore 'Raw SSS' data were assessed in full and have been rated as 'Average' using the above criteria table. The data displayed occasional weather noise and cable snatching due to sea state and/or weather conditions, and some systematic electric noise was present in some of the lines. However, large and smaller features were visible in the data and as such these were considered suitable for archaeological assessment.

3.5.29 The offshore 'Raw SSS' data were not assessed in full and only specific locations were assessed. These have been rated as 'Average' using the above criteria table. Some of the data displayed weather noise and cable snatching due to sea state and/or weather conditions, and some systematic electric noise was present in some of the lines in the outer ranges which affected interpretation to a small degree. However, in general it is possible to identify large, significant features in the data and, as such, the data are considered suitable for this assessment.

3.5.30 The intertidal Mag. data have been rated as 'Average' using the above criteria table. The shorter line spacing means that smaller ferrous features that were not directly covered may have been picked up in the data. Some spiking and general background noise due to the shallower water depths was visible in the data. However, after processing, the data were generally suitable for archaeological assessment.

3.5.31 The nearshore Mag. data have been rated as 'Average' using the above criteria table. Some spiking and general background noise due to the shallower water depths were visible in the data. The line spacing of 30m means that smaller ferrous features which aren't directly covered by a line of Mag. data may not have been picked up in the data. However larger features such as wrecks and substantial ferrous debris would have still been identifiable in the data and, as such, the data set was considered suitable for archaeological interpretation.

3.5.32 The offshore Mag. data have been rated as 'Average' using the above criteria. The line spacing of 50m, although relatively short for a PEIR assessment, means that any smaller ferrous features which are not directly covered by a line of Mag. data may not have been picked up in the data. However larger features such as wrecks and substantial ferrous debris would have still been identifiable in the data and, as such, the data set was considered suitable for archaeological interpretation.

Anomaly Grouping and Discrimination

3.5.33 The previous section describes the initial interpretation of all available geophysical datasets which were conducted independently of one another. This inevitably leads to the possibility of any one object being the cause of numerous anomalies in different datasets and apparently overstating the number of archaeological features in the exploration area.

3.5.34 To address this fact the anomalies were grouped together; allowing one ID number to be assigned to a single object for which there may be, for example, a UKHO record, a MBES anomaly, and multiple SSS anomalies.

3.5.35 Once all the geophysical anomalies and desk-based information have been grouped, a discrimination flag is added to the record in order to discriminate against those which are not thought to be of an archaeological concern. For anomalies located on the seabed, these flags are ascribed as follows (**Table 4**).

Table 4 Criteria discriminating relevance of identified features

Overview classification	Discrimination	Criteria	Data type
Palaeogeographic features	P1	Feature of probable archaeological interest, either because of its palaeogeography or likelihood for producing palaeoenvironmental material	SBP, MBES
	P2	Feature of possible archaeological interest	SBP, MBES
Seabed features	A1	Anthropogenic origin of archaeological interest	MBES, SSS, Mag.
	A2_h	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature	MBES, SSS, Mag.
	A2_l	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature	MBES, SSS, Mag.
	A3	Historic record of possible archaeological interest with no corresponding geophysical anomaly	MBES, SSS, Mag.
	A4	Position of geophysical anomaly at which no anthropogenic features were identified, either visually or on sensors, during subsequent ROV/diver survey	Groundtruthing reports, MBES, SSS, Mag.
Non-archaeological features	U1	Not of anthropogenic origin	MBES, SSS, Mag.
	U2	Known non-archaeological feature / Feature of non-archaeological interest	MBES, SSS, Mag., SBP
	U3	Recorded loss	MBES, SSS, Mag.
Non-impact features	O1	Outside horizontal footprint of study area	MBES, SSS, Mag., SBP
	O2	Outside vertical footprint of proposed impact	SBP
	O3	Area subsequently cleared after data acquired, anomaly/object recovered	MBES, SSS, Mag., SBP

Overview classification	Discrimination	Criteria	Data type
	O4	Anomaly/feature identified during previous assessments but since likely to have been disturbed or moved by natural seabed processes. Unlikely to be at original location. New location unknown.	Groundtruthing reports, MBES, SSS, Mag.
	O5	Below the minimum size threshold for the archaeological assessment	MBES, SSS, Mag.
	D	Anomaly/feature subsequently confirmed as UXO and detonated in situ.	UXO reports

3.5.36 The grouping and discrimination of information at this stage is based on all available information and is not definitive. It allows for all features of potential archaeological interest to be highlighted, while retaining all the information produced during the course of the geophysical interpretation and desk-based assessment for further evaluation should more information become available.

3.5.37 Any anomalies located outside of the defined cable corridor, either previously recorded in known databases (e.g. UKHO) or identified during this geophysical assessment, are deemed beyond the scope of the current assessment and are subsequently not included in this report.

3.6 Geotechnical Survey Methodology

Introduction

3.6.1 To frame geoarchaeological investigations of this nature, Wessex Archaeology has developed a five-stage approach, encompassing different levels of investigation appropriate to the results obtained, accompanied by formal reporting of the results. The stages are summarised below (**Table 5**).

3.6.2 This assessment presents the results of a Stage 1 review of geotechnical logs, with recommendations made for any further geoarchaeological works (i.e. Stage 2 geoarchaeological recording) if deemed necessary.

Table 5 Staged approach to geoarchaeological investigations

Stage	Description
Stage 1: Geoarchaeological review	Desk-based review of geotechnical and geological data. Establish likely presence/ absence/ distribution of archaeologically relevant deposits. Identify deposits or samples for Stage 2 works.
Stage 2: Geoarchaeological recording/monitoring	Target deposits or samples identified in Stage 1. Describe the sequences recovered and undertake deposit modelling (if suitable). Interpret depositional environment (if possible). Identify if suitable deposits are present for Stage 3 works.
Stage 3: Palaeoenvironmental assessment	Sub-sample deposits of archaeological interest for paleoenvironmental assessment (e.g. pollen, plant macrofossils, foraminifera, ostracod and diatoms) and associated scientific dating. Provide an outline interpretation of the archaeological and palaeoenvironmental context. Any recommendations for Stage 4 works will depend on the potential for further analysis and the project research objectives.
Stage 4: Palaeoenvironmental analysis	Full analysis of samples and additional scientific dating as specified in Stage 3, together with a detailed synthesis of the results, in their local, regional or wider archaeological and palaeoenvironmental context. Publication would usually follow from a Stage 4 report.

Stage	Description
Stage 5: Publication	Publication of the results of Stage 1-4 works for submission in a peer reviewed journal, book or monograph, depending on the archaeological significance of the work. The scope and location of the final publication will be agreed in consultation with the client and regulatory bodies where appropriate.

3.6.3 Total of 224 vibrocore logs were acquired during geotechnical surveying undertaken in September 2024. Geotechnical logs were provided by Next Geosolutions and reviewed as part of the geoarchaeological assessment in order to identify deposits of potential archaeological interest. Interpretations were made regarding both likely depositional environment and formation processes of the recovered sediment.

3.6.4 The vibrocores were drilled across the study area to a maximum depth of 6.3m below sea floor (mbsf) using a high-performance corer. Vibrocores were acquired in clear liners, split into 1m sections offshore and transported to the laboratory of Next Geosolutions, where they were split lengthways, photographed, and described in detail. Geotechnical logs and core photographs were provided to Wessex Archaeology for review and geoarchaeological assessment. The location of vibrocores recovered from the study area are presented in standalone report – *LionLink Stage 1 Geoarchaeological Review of 2024 Offshore Geotechnical Data* (Wessex Archaeology, 2025).

3.6.5 Vibrocores were assigned either a high, medium or low status based on their perceived archaeological potential.

Deposit Modelling

3.6.6 Following the Stage 1 review, a targeted selection of geotechnical vibrocores assigned medium or high archaeological potential were recommended for Stage 2 recording. As part of the Stage 2 works a series of two-dimensional transects showing the distribution, extent and thickness of deposits were also recommended. The results will be included in the ES.

3.7 Assessment of Setting

3.7.1 The NPPF (HM Government, 2024: 78) defines setting as “the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.”

3.7.2 Currently, there is no specific guidance regarding the assessment of setting for offshore archaeological and cultural heritage assets. However, Historic England’s *The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning 3* (Historic England, 2017) provides general guidance, largely applicable to terrestrial sites, and notes that the importance of setting “lies in what it contributes to the significance of the heritage asset” (Historic England, 2017: 4). With regards to significance for heritage policy, NPPF notes that the interest of a heritage asset “may be archaeological, architectural, artistic or historic” (HM Government, 2024: 78).

3.7.3 Historic England states that setting depends on a “wide range of physical elements within, as well as perceptual and associational attributes pertaining to, the heritage asset’s surroundings” (Historic England, 2017: 4). One aspect that contributes to the setting of a heritage asset is referred to as ‘views’, which includes not only views that can contribute to its significance, but also intended views between heritage assets, and planned views. In addition, the guidance suggests that the appreciation of the setting of a site does not depend

on the ability to access it (Historic England, 2017). Reference in the guidance is also made to the setting associated with buried heritage assets which may not be readily appreciated by a casual observer, but retains a presence in the landscape such as, for example, wreck sites that are periodically, partly or wholly submerged. In addition, the location and setting of historic battles, with otherwise no visible traces, may include important strategic views, routes by which opposing forces approached each other and a topography that played a part in the outcome (Historic England, 2017: 4-5).

3.7.4 In order to assess whether, how and to what degree setting makes a contribution to the significance of heritage assets, the following must be considered: the physical surroundings of the asset including its relationship with other heritage assets; the way the asset is appreciated, and the asset's associations and patterns of use.

3.7.5 The assessment of setting in this document follows the guidance discussed in the paragraphs above, is based on the baseline assessment of the palaeogeography, maritime and aviation assets, and is described using the following two factors:

- physical surroundings and views – which includes the physical presence of the asset on the seabed, its surroundings, and relationship with other assets and navigational hazards in the immediate area. Views to and from the asset, and how the asset is experienced in its immediate physical surroundings are also considered; and

- non-visual factors – including the way the asset is appreciated in a broader historical, artistic and intellectual capacity, and the asset's associations.

3.7.6 It should be noted that for heritage assets offshore, sites are generally only experienced by divers, remotely operated vehicle (ROV) or by geophysical survey, and the views to the asset are often very limited due to reduced visibility in the water column. In addition, unlike many terrestrial sites, the position of the asset on the seabed has not been deliberately chosen, and although some sites may have reached their position through military action (e.g. hitting a mine within a known minefield or in a battle) or have been lost due to a particular navigational hazard (e.g. being stranded on a particular sandbank), many recorded positions are arbitrary, and even with military sinking events, an attack on the surface could lead to a wreck being deposited on the seabed miles from where the event took place. Non-visual factors may include associations with particular battles, wars, minefields and other historic events, as well as how the wreck can be appreciated in its wider context, for example through well-known trade routes, collisions or local industry. Association between the asset and the local social history is another important aspect of an asset's non-visual importance, including rescue attempts or losses occurring within modern memory.

3.7.7 It is not possible to ascertain the setting of currently unidentified marine heritage assets, where limited information is known, for example wrecks that have not been identified or characterised to determine their period of build, use or loss. Similarly, setting cannot be assessed for geophysical anomalies of archaeological potential or potential sites that have not yet been discovered.

3.8 Determining Importance (or Value) and Sensitivity

3.8.1 This report will adopt the conceptual approach known as the 'source-pathway-receptor' model. This approach is based on the identification of the source (i.e. the origin of a potential impact), the pathway (i.e. the means by which the effect of the activity could impact a receptor) and the receptor that may be impacted (e.g. known / potential heritage assets). In

order for the significance of any given impact to be fully understood, the sensitivity of any receptors that may be impacted need to be considered. This section outlines the means by which the sensitivity of marine heritage assets is ascertained.

3.8.2 The perceived importance of each marine archaeological asset is generally assessed and assigned on a site-by-site basis, depending on the criteria listed in **Table 6**. The UK MPS (HM Government, 2011: 90) describes a heritage asset as holding a degree of significance. Significance relates to the heritage interest of an asset that may be archaeological, architectural, artistic or historic.

3.8.3 The sensitivity of an asset is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. The sensitivity of the asset will be assessed with regard to the following factors:

- adaptability or vulnerability- the degree to which an asset can avoid or adapt to an effect;
- tolerance - the ability of an asset to accommodate temporary or permanent change without significant adverse impact;
- recoverability - the temporal scale over and extent to which an asset will recover following an effect; and
- value - a measure of the asset's importance, rarity and worth.

3.8.4 Archaeological and cultural heritage assets cannot typically adapt, tolerate or recover from physical impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each asset is predominantly quantified only by their value. For the purposes of this assessment, value and importance are treated as equivalent terms.

3.8.5 Based on Historic England's *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (English Heritage (now Historic England), 2008), the significance of a historic asset “embraces all the diverse cultural and natural heritage values or interests that people associate with it”.

3.8.6 Within this document, significance is weighed by consideration of the potential for the asset to demonstrate the following value criteria:

- evidential value - deriving from the potential of a place to yield evidence about past human activity;
- historical value - deriving from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative;
- aesthetic value - deriving from the ways in which people draw sensory and intellectual stimulation from a place; and
- communal value - deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values but tend to have additional and specific aspects.

3.8.7 With regards to assessing the importance of shipwrecks, the following criteria listed in *Ships and Boats: Prehistory to Present - Designation Selection Guide* (English Heritage (now Historic England), 2012) can be used to assess an asset in terms of its value:

- period;
- rarity;
- documentation;
- group value;
- survival/condition; and
- potential.

3.8.8 These aspects help to characterise each asset whilst also comparing them to other similar assets. The criteria also enable the potential to contribute to knowledge, understanding and public engagement to be assessed.

3.8.9 The value of known archaeological and cultural heritage assets is assessed on a five-point scale using professional judgement informed by criteria provided in **Table 6** below. This table derives from the Aggregate Levy Sustainability Fund funded *Marine Class Description and principles of selection for aggregate producing areas project* (ALSF 5383), undertaken by Wessex Archaeology (2008c).

Table 6 Criteria to assess the archaeological value of marine assets

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

Value	Definition
	Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
Low	Below average example and / or low potential to contribute to knowledge and understanding and / or public engagement. Assets with a demonstrable local level dimension to their importance are likely to fall within this category. Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have low potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation Prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment.
Negligible	Poor example and / or little or no potential to contribute to knowledge and understanding and / or public engagement. Assets with little or no surviving archaeological interest.

3.8.10 Furthermore, *On the Importance of Shipwrecks* (Wessex Archaeology, 2006) suggests importance can be assessed through the following criteria: build, use, loss, survival and investigation (BULSI).

3.8.11 In general, the *Selection Guide on Boats and Ships in Archaeological Contexts* (Wessex Archaeology, 2008d) drew some generalisations about value based on the age of the wreck:

- Pre-1500 AD: this covers the period from the earliest Prehistoric evidence for human maritime activity to the end of the medieval period, circa 1508. Little is known of watercraft or vessels from this period and archaeological evidence of them is so rare that all examples of craft are likely to be of special value.
- 1501-1815: this encompasses the Tudor and Stuart periods, the English Civil War, the Anglo-Dutch Wars and later the American Independence and French Revolutionary Wars. Wrecks and vessel remains from this date are also quite rare, and can be expected to be of special value.
- 1816-1913: this period witnessed great changes in the way in which vessels were built and used, corresponding with the introduction of metal to shipbuilding, and steam to propulsion technology. Examples of watercraft from this period are more numerous and as such, it is those that specifically contribute to an understanding of these changes that should be regarded as having special value.
- 1914-1945: this period encompasses the First World War, the Interwar years and the Second World War. This date range contains Britain's highest volume of recorded boat and ships losses. Those which might be regarded as having special interest are likely to relate to technological changes and to local and global activities during this period.
- Post 1945: the final period extends from 1946 through the post-war years to the present day. Vessels from this date range would have to present a strong case if they are to be considered of special interest.

3.8.12 According to this composite timeline, vessels that pre-date 1816 are likely to be considered of special value on the basis of their rarity and subsequent national and international value in our understanding of maritime activity and shipping movements during these periods.

3.8.13 Wrecks dating from 1816 to the present day are more plentiful amongst known wrecks. The *Marine Class Description* project (Wessex Archaeology, 2008c) further revealed that a total of 96% of known and dated wrecks were lost in the period between 1860 and 1950. Due to their predominance in the known marine archaeological record, the special value of wrecks of this period thus depends upon their ability to exhibit both integral and relative factors based on attributes relating to the Wessex Archaeology 'BULSI' system of wreck assessment. The ALSF-funded project *Assessing Boats and Ships 1860-1950* (Wessex Archaeology, 2011) explored this further by providing a national stock-take of known wrecks in Territorial Waters off England and review it in the light of the framework for assessing special interest prepared in the *Marine Class Description* project (Wessex Archaeology, 2008c) and historical thematic studies.

3.8.14 The *Early Ships and Boats (Prehistory to 1840)* provided further information about earlier vessels (Wessex Archaeology, 2013a). Through undertaking a national stock-take of wrecks dating to this period within English Territorial Waters, this project provides supplementary guidance on the key themes and interests represented by such wrecks, in order to inform decisions regarding importance and mitigation. These are summarised thus:

- does it illustrate a key narrative of the period;
- does it represent a distinct and tangible link to significant persons or events;
- is it representative of significant loss of life or related responses in seafaring safety;
- does it make a distinct cultural contribution; and
- does it have current relevance or parallels.

3.8.15 The nature of the archaeological resource is such that there is a high level of uncertainty concerning the distribution of potential, unknown archaeological remains on the seabed. It is often the case that data concerning the nature and extent of sites is out of date, extremely limited or entirely lacking. As a precautionary measure, unknown potential cultural heritage receptors are therefore considered to be of high sensitivity and high value.

3.9 Assumptions and Limitations

Archaeological Data

3.9.1 Data used to compile this chapter comprises secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this appraisal. The assumption is made that the secondary data, as well as that derived from other secondary sources, are reasonably accurate.

3.9.2 The records held by the UKHO, NMHR, HER and the other sources used in this appraisal 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 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.

Geoarchaeological data

3.9.3 Data used to compile this chapter were collected for geotechnical purposes and have not been directly recorded by a geoarchaeologist. Despite the high resolution of geotechnical vibrocore logs, it is often difficult to determine the depositional history of deposits based on

descriptions alone and in the absence of supplementary palaeoenvironmental and chronological information. Interpretations of likely Offshore Formation and mode of deposition are therefore inferred and will require correlation through direct study of physical sediment records (vibrocores) and features identified in SBP data.

Geophysical data

3.9.4 Although all data sets were considered suitable for archaeological assessment, a significant amount of mobile sediment was present across the study area which will have affected the visual detection of anomalies on the seabed in the SSS and MBES data to a significant degree.

3.9.5 To facilitate the detection of any potentially buried ferrous debris, no thresholding was applied to the Mag. data. However, there is still potential for further buried debris to be present across the study area, which may have not been detected.

3.9.6 There are three locations where the geophysical data do not cover the full extents of the study area as provided to Wessex Archaeology. One area is in Block 9, the route development option, which has since been selected to form the preferred route and is part of the Draft Order Limits. The second area is in Block 18, towards the edge of the UK EEZ waters, where the study area splits into two routes, with the northern segment not covered by any geophysical datasets. The third area is in Block 19, towards the edge of the UK EEZ waters, where the study area flares. Any features present within these three areas will not have been detected. No SBP data was provided for the route development option within Block 9 and Block 18 (see **Figure 1**), and so a palaeogeographic assessment for these sections could not be undertaken.

4 MARINE ARCHAEOLOGICAL ASSESSMENT: PALAEOGEOGRAPHY

4.1 Introduction

4.1.1 Geoarchaeological assessments are typically undertaken with reference to geological periods (e.g. Quaternary), epochs (e.g. Pleistocene) and sub-epochs (e.g. Devensian) that reflect major climate sea-level and/or environmental changes. Here we adopt standard British nomenclature correlated to the Marine Isotope Stage (MIS) record to distinguish between different climatic periods, with dates given in Kya (thousands of years before present). MIS are deduced from marine palaeoclimatic records and reflect alternating warm (interglacial and interstadial) and cold (glacial and stadial) periods throughout the Quaternary. Some Marine Isotope Stages can be subdivided into sub-stages reflecting relatively warmer (interstadial) or Cool (stadial) periods within a single stage.

4.2 Geological Baseline and Palaeogeographic Potential

4.2.1 The recent geological history of the southern North Sea is directly linked to glacial / interglacial cycles experienced by the area during the Pleistocene (2.5 million – 10 Kya), which resulted in large areas of the southern North Sea being periodically exposed as a terrestrial environment. This is represented in the geological record, with distinct terrestrial landscape features being present, interspersed with deposits of marine and glacially derived sediments. Due to these fluctuations in climate, corresponding rises and falls in eustatic sea level, and major reconfigurations of the landscape during the last million years, the archaeological record is phased between periods of enhanced occupation, and assumed periods of hiatus or low occupation numbers, when environmental conditions or high sea levels are assumed to have restricted access to Britain (**Figure 2**).

4.2.2 These changes in relative sea level are broadly correlated with changes in the MIS (Marine Isotope Stage) curve; however, direct dated evidence of relative sea level (RSL), and detailed mapping of the topography of the region, is required to accurately model palaeogeography over time.

4.2.3 The study area is situated at the southern end of the North Sea basin, in an area characterised by Pleistocene and Holocene sediments (Cameron *et al.,* 1992), comprising clays, silts, sands and gravels with occasional organic-rich deposits (peats), overlain by recent, unconsolidated marine shelly sands.

4.2.4 The oldest deposits likely to be encountered across the study area belong to the Westkapelle Ground Formation, which are located near to the present-day Norfolk coast and have been mapped extending up to 20 km offshore. The Westkapelle Formation is Praetiglian and Tiglian in age (2.3–1.6 Ma) and therefore precedes the earliest known occupation of Britain. However, there is clear evidence for an early human presence in Southern Europe by this point. This formation represents deposition in a pro-delta setting (Cameron *et al.*, 1992).

4.2.5 The only evidence of ice contact in the study area is associated with the Anglian glaciation (480-423ka Kya or MIS 12), when ice extended into the southernmost North Sea. The southern extent of the Anglian glaciation is highly debated, however based on bathymetric data Dix and Sturt (2011) argue for an Anglian glacial origin for over-steepened valleys (tunnel valleys) identified within the Outer Thames Estuary.

4.2.6 East Anglia and Suffolk, and areas immediately offshore, are currently thought to have experienced only one glacial advance during the Pleistocene. Palaeolandscape features from periods of low relative sea level are therefore more likely to be preserved here than further north (approximately north of the north Norfolk coast), where they have been impacted on during the subsequent Saalian (MIS 10-6) and Devensian (MIS 5d-2) glacial advances. Some surviving Pleistocene deposits may have been reworked or redeposited to a certain extent during subsequent marine transgressions (Cameron *et al.*, 1992), but there is potential for them to survive on the seabed.

4.2.7 Based on British Geological Survey (BGS) mapping, the study area transects a large area associated with a geological formation defined as the Brown Bank Formation, which includes deposits of silty sand, sandy silt and sandy silty clay, overlaying deposits of shelly silty sand and sandy silt. The Brown Bank Formation has been previously dated into two broad ranges: MIS 3 and MIS 5d-5c (Limpenny *et al.*, 2011; Tizzard *et al.*, 2014; 2015; Wessex Archaeology, 2019a; 2019b). The date of the Brown Bank Formation has significant implications both for our understanding of the palaeogeographic development of the North Sea, when connections would have allowed access to Britain, as well as the nature and significance of any archaeology, if preserved. As the study area transects the mapped extent of the Brown Bank, it presents an opportunity to identify possible margins of this extensive shallow water feature which may have been hotspots for human occupation.

4.2.8 In places across the southern North Sea, sequences of early Holocene deposits are mapped overlying Pleistocene sediments. The Holocene sediments include organic-rich peats along with more minerogenic fluvial and alluvial sediments, most often infilling channels (Limpenny *et al.*, 2011; Tappin *et al.,* 2011; Tizzard *et al.,* 2015) but also preserved on the Brown Bank Formation or overlying periglacial aeolian sediment. The peats are of high geoarchaeological potential, preserving a range of palaeoenvironmental remains and material suitable for radiocarbon dating.

4.2.9 Pleistocene and early Holocene sediments are capped by post-transgression marine sands. The progressive inundation of the North Sea occurred over an extended time scale, with particularly rapid sea-level rise during the early Holocene (11.5-7 Kya), and with fully marine conditions occurring by around 6 Kya (Sturt *et al.,* 2013).

4.3 Archaeological Record and Palaeogeographic Potential

4.3.1 The southern North Sea off the east coast of East Anglia and Suffolk is known to contain relatively well preserved palaeolandscape features such as fluvial channels that formed during periods of lower sea level when the southern North Sea was free of ice. The remains of these terrestrial landscapes are frequently recovered by dredging and fishing activities in numerous areas around the southern North Sea generally in the form of the remains of extinct megafauna (e.g. woolly mammoths, woolly rhinoceros, bison, horse, lion and hyena).

4.3.2 The discovery of actual human artefacts, such as stone tools and worked bone, and even human remains is a rarer occurrence (e.g. Hublin *et al*., 2009) but is recorded from offshore contexts. Reported finds from offshore activity has, to date, produced a range of early prehistoric lithic artefacts indicating early prehistoric activity in submerged palaeolandscapes from Lower, Middle, and Upper Palaeolithic periods (Tizzard *et al.*, 2015) with notable collections of more recent Mesolithic artefacts from submerged palaeolandscape contexts (Momber *et al.*, 2011; Wessex Archaeology, 2013c).

4.3.3 The earliest records of Lower Palaeolithic archaeology from northern Europe are associated with terrestrial deposits on margins of the North Sea basin in East Anglia and Suffolk, most notably from Pakefield (Parfitt *et al*., 2005) and Happisburgh Site 3 (Parfitt *et al.*, 2010). Whilst the archaeology at Pakefield was created during a fully interglacial, more Mediterranean climate, at around MIS 17 (**Figure 2**), the remains at Happisburgh Site 3 are older (MIS 21 or MIS 25) and the environmental evidence is indicative of cool conditions at the edge of the boreal zone (Candy *et al*., 2011) which implies that these early hominins were capable of surviving in northern Europe in periods not associated with fully interglacial environments (Parfitt *et al*., 2010). The importance of these sites is international, as they are currently unique at this latitude for this early date (Wessex Archaeology, 2013c). The site at Pakefield is located approximately 17 km north along the coast from the proposed landfall at Walberswick.

4.3.4 Cohen *et al.* (2012) highlighted the North Sea basin as a key region for understanding Pleistocene hominins within a northerly, coastal environment. The east of England, including the southeast of England, are important regions for later Middle Pleistocene, Lower Palaeolithic archaeology (MIS 13-MIS 9). During this timeframe British archaeology reflects repeated episodes of hominin occupation during temperate interglacial and cool conditions, separated by phases of hominin absence during fully glacial periods.

4.3.5 Archaeological evidence is particularly abundant during MIS 13 and MIS 11 (**Figure 2**) (Wymer, 1999; Pettitt and White, 2012) when warmer climate conditions meant Britain was again available to be recolonised by hominin communities, after a period of absence during the preceding Anglian glaciation (MIS 12). Lower Palaeolithic archaeological assemblages of this date tend to be characterised by handaxes, although during the earlier part of MIS 11, collections lacking handaxes (termed Clactonian) have been recognised. The foreshore, cliffs and hinterland at Clacton-on Sea (Essex) comprise an important Lower Palaeolithic site which is a designated geological Site of Special Scientific Interest (SSSI). Channel sediments from the area are also an important site for the Lower Palaeolithic Clactonian flint industry and have yielded a rare wooden spear alongside lithic artefacts. This archaeology dates from the Hoxnian interglacial period (MIS 11, c.423-380 Kya) (Sumbler,

1996; Bridgland *et al.*, 1995), and the type site for the Hoxnian (the Hoxne Brick Pit) is located a relatively short distance inland outside of Diss, Suffolk (Ashton *et al.*, 2008).

4.3.6 During the MIS 10 glaciation (**Figure 2**) there appears to have been a hiatus in hominin activity in Britain (Lewis *et al.*, 2011). The post MIS 10 occupation Britain is associated with the emergence of the Neanderthals and their associated archaeology and patterns of behaviour. From the later part of MIS 9 the archaeological record attests to the development of Levallois core working strategies. This is also seen to mark the end of the Lower Palaeolithic and the beginning of the Middle Palaeolithic. The Levallois technique comes to dominate the British archaeological record during the early Middle Palaeolithic (late MIS 8 and MIS 7), with handaxe production occurring infrequently (Scott and Ashton, 2011).

4.3.7 The international importance of early Middle Palaeolithic archaeology in the southern North Sea is highlighted by the numerous sites preserved within the Thames river terraces (Scott and Ashton, 2011; White *et al.*, 2006) and by the submerged prehistoric Levallois lithic assemblage from marine aggregates licence Area 240 in the palaeo-Yare catchment. Over 120 artefacts have now been recovered from this locale, some of which are identifiable as Levellois, with many recovered from *in situ* or minimally disturbed contexts (Tizzard *et al.*, 2015; Boismier *et al.*, 2012).

4.3.8 Palaeogeographically, Area 240 is one of the most northerly Neanderthal sites in northwest Europe and of primary archaeological importance for defining Middle Palaeolithic potential and the contemporary palaeogeography across the southern North Sea basin (Tizzard *et al.*, 2014). Area 240 is approximately 16km north of the Proposed Offshore Scheme and highlights the archaeological potential of preserved Pleistocene fluvial deposits within the southern North Sea. The Proposed Offshore Scheme crosses over palaeogeographic features previously interpreted from the wider Palaeo-Yare catchment area associated with Area 240.

4.3.9 Within the Outer Thames Estuary, a large Palaeolithic assemblage including over 200 Levallois flakes was recovered from aggregate deposits forming the Clacton to Holland-on-Sea beach replenishing scheme (Bynoe, 2018). These deposits were originally sourced from marine aggregate License Area 447, located in an area where the confluent post-Anglian (<MIS 12) Rivers Thames, Medway and Blackwater would have been located (Bridgland and d'Olier, 1995; Sturt and Dix, 2009). It is therefore likely that this Middle Palaeolithic assemblage originates from submerged Pleistocene deposits relating to this channel complex.

4.3.1 There is increasing evidence for an early human presence within submerged landscapes of the Southern North Sea and Eastern Channel Region during the Ipswichian (MIS 5e) and Early Devensian (MIS5d-a), registered by occasional occurrences of stone tools from near-coastal contexts, or contexts close to the estuarine reaches of major rivers (Wenban-Smith et al. 2010; Wessex Archaeology 2023b; Shaw et al. 2025.) This evidence is sparse, and it has been argued that humans did not reach Britain during MIS 5e (Lewis *et al.* 2011, Pettitt and White 2012).

4.3.2 Within the context of early prehistory and submerged palaeogeography, however, substantial areas of the southern North Sea basin would have been dry land during the warming and cooling limbs of the various sub-stages (MIS 5d to 5a, **Figure 2**) and archaeological sites of this age are relatively abundant in northern France (Lewis *et al.*, 2011; Pettitt and White, 2012). Therefore, the potential exists for human activity to have occurred sporadically both within Britain and in any sub-aerially exposed parts of the southern North Sea basin, during the early Devensian.

4.3.3 From late MIS 4 to MIS 3 there is evidence in Britain for Neanderthal recolonisation. This late Middle Palaeolithic archaeological record is associated with morphologically and technologically distinctive handaxes (White and Jacobi, 2002). A key site belonging to this period is Lynford Quarry, Norfolk where a palaeochannel containing mammoth remains and associated late Middle Palaeolithic stone tools and debitage have been recovered (Boismier *et al.*, 2012).

4.3.4 In the early Upper Palaeolithic, at the end of the Late Pleistocene, Neanderthals were replaced in northern Europe by modern humans who, occupying and moving through what is now the southern North Sea, were present in in Britain from around 34 Kya (Jacobi and Higham, 2011; Bicket and Tizzard, 2015). Archaeological evidence for this period consists of blade point/leaf point assemblages, thought to be associated with the final Neanderthal occupation of Britain, and small number of findspots associated with Evolved Aurignacian and Gravettian lithic artefacts which were produced by modern humans (Jacobi and Higham, 2011).

4.3.5 During the last glacial period, the study area will have been beyond, yet close to the maximum Devensian ice margin. At the maximum of the last glacial period, the environment within the southern North Sea was relatively poor for human colonisation, with humans absent from Britain during these peak cold conditions. However, there was increasing human exploitation after ~15 Kya. Humans at this time were hunting game, such as mammoth and deer, and evidence of these animals has been reported through marine aggregate dredging, and the associated reporting requirements (Bicket and Tizzard, 2015).

4.3.6 The onshore archaeological record of later Upper Palaeolithic activity is marked by Creswellian/Final Magdalenian stone tool assemblages associated with the later Upper Palaeolithic recolonization of Britain (Jacobi and Higham, 2011), and offshore locations may provide unique and important context for coastal and lowland human activity during this period.

4.3.7 The Mesolithic period began in the early Holocene and at around 10 Kya, sea levels were approximately 35 m below current levels (Shennan and Horton, 2002) sub-aerially exposing large parts of the southern North Sea and English Channel making them suitable for human occupation. Archaeological and palaeoenvironmental material from this period has been reported from North Sea contexts for over a century (Shennan and Horton, 2002) For example, a Maglemosian harpoon artefact was trawled in the early 20th century and was later radiocarbon dated to around 12,000 Kya (Housley, 1991).

4.3.8 Between 8 and 5 Kya, much of the landscape was inundated by eustatically driven sea-level change, and by 6 Kya sea level was only approximately 7 m below the present level (Shennan and Horton, 2002). Around this time, Britain became an island again (Coles, 1998: 67) and rising sea levels forced communities further inland. As temperate climates returned, the open plains were gradually replaced by forested areas and the large herds of reindeer, buffalo and horse hunted during the Palaeolithic were replaced by forest dwelling animals such as red deer, roe deer and wild cattle. Mesolithic hunters and gatherers also began to rely on the gathering of shellfish and vegetable foods. Settlements at the time were often transitory and seasonal, and therefore leave little trace in the archaeological record, however, new types of stone tools were introduced during this period.

4.3.9 It is clear from numerous research and development-led investigations that postglacial marine transgression has not destroyed Pleistocene and Holocene palaeogeography by default (Wessex Archaeology, 2013c). Areas of preserved palaeogeographic features do remain, and detailed reconstructions of palaeoenvironments and palaeogeography can be

achieved for large parts of the North Sea basin (Tappin *et al.*, 2011; Limpenny *et al.*, 2011; Dix and Sturt, 2011).

4.3.10 Considerable attention has been paid to Mesolithic landscapes of the southern North Sea (Gaffney *et al.*, 2007; Tappin *et al.*, 2011) as the now-submerged palaeolandscapes provide key contextual evidence for recovered artefacts and a background landscape within which to place these human communities. Increasingly, a maritime perspective has developed for understanding the early prehistoric archaeological record, where coasts, estuaries and wetlands are key landscape elements (Ransley *et al.*, 2013).

4.4 Palaeogeographic Assessment Results

4.4.1 The shallow geology within the study area has been interpreted based on the SBP data, which has been correlated with the Stage 1 geoarchaeological assessment results and divided into the Units described below in **Table 7**.

4.4.2 Due to the addition of the results of the SBP data assessment, the stratigraphy provided below differs from that originally provided as part of the Stage 1 geoarchaeological assessment (Wessex Archaeology 2025). This is to be expected due to the different nature of the two datasets: vibrocore samples and the resulting sediment descriptions are of a high resolution vertically, but very limited in lateral spatial information whereas the SBP data provides better lateral coverage, infilling the gaps between the vibrocore locations, but is of lower vertical resolution and detail than the vibrocore samples. As such, some features will be identified in the SBP data that were not visible within the vibrocore samples and, likewise, there may be some changes in sediments which are not definitively identified in the SBP data.

4.4.3 A number of distinct palaeogeographic features have also been identified within the SBP data during the course of the assessment. These have been collated in gazetteer format detailed in **Appendix 3,** and their distribution within the study area is illustrated in **Figure 3a-n**. The identified units and selected individual features are also discussed below.

Table 7 Shallow stratigraphy of deposits within the study area

Unit	WA Unit name	Geophysical description	Geoarchaeological description	Formation	Epoch
8	Seabed sediment	Generally, acoustically unstructured/chaotic, ranging in thickness from a thin veneer to mobile sand ripples and sand waves up to a few metres high.	Fine to coarse sand with shell fragments.	Seabed sediment	Modern / Late Holocene
7	Possible dunes / banks	Small features within seabed sediment characterised by a well-defined upper reflector and steeply dipping internal reflectors.	n/a	Transgression	Mid-Holocene
6d	Head	Not definitively identified in the geophysical data.	Soft to firm slightly sandy and gravelly clay.	Pre-transgression terrestrial	?Early to mid-Holocene

Unit	WA Unit name	Geophysical description	Geoarchaeological description	Formation	Epoch
6c	Organic interbedded	Characterised nearshore by very densely packed, sub-horizontal internal reflectors and a distinct, low relief basal reflector. Not definitively identified offshore.	Olive to reddish brown silty sand with beds of organic silt and clay.		Early Holocene (pre-transgression)
6b	Peat	Generally discontinuous horizontal high amplitude reflector. Beneath sand waves offshore and early Holocene deposits nearshore.	Dark brown peat.		?Early Holocene to Cromerian (MIS>13-1)
6a	Fluvial sands and gravels / alluvial / channels	Distinct channel features with erosive bases and fills generally characterised by parallel internal reflectors.	Orangish brown gravelly sands and sandy gravels (fluvial) and laminated sands (alluvial).		
5c	Estuarine to intertidal sands	Distinct areas of parallel internal reflectors; can be present within channels, form banks, or be a blanket deposit. Difficult to definitively distinguish between the geoarchaeological sub-units.	Gravelly fine to coarse sands with shell fragments and thin beds and laminae of silts and clays.	Brown Bank Formation	Early to Mid-Devensian (MIS 5d-3)
5b	Estuarine alluvium		High strength greenish grey sandy silty clay and clayey silt.		
5a	Intertidal to shallow marine		Greenish grey fine to coarse occasionally gravelly sand with occasional faint laminae.		Early Devensian (MIS 5e-5d)
4	Marine to shallow marine	Extensive generally acoustically transparent unit with faint horizontal internal reflectors.	Dense brown sands with frequent shell fragments. Frequently overlain by organic silt/sand.	Eem Formation	Ipswichian Interglacial (MIS 5e)
3	Grey sands	Extensive deposit that is acoustically transparent/unstructured in some areas, and in others exhibits faint internal reflectors/structures.	Light greenish grey fine to medium silty sand and clayey sand with thin beds of stiff clay.	Yarmouth Roads Formation	Cromerian (>MIS 13)
2	Stiff clays	Area of faint to distinct dipping parallel reflectors, with a poorly defined basal reflector.	Stiff silty clay and clayey silt.	Westkapelle Ground Formation	Early Pleistocene
1	Red / grey sands	Acoustically transparent with little or no internal features and a strong upper bounding reflector.	Various lithologies of silty sand and gravel.	Undifferentiated Crag Formations	Pliocene to Early Pleistocene

4.4.4 The oldest unit tentatively identified within the study area is Unit 1, interpreted to be undifferentiated Crag formations. There are multiple such formations (e.g. Red Crag, Coralline Crag, Norwich Crag) known to be present within the study area, all of which are of similar lithologies and so are expected to have similar acoustic properties within the SBP data. BGS mapping suggests the formation here is likely to be the Red Crag Formation, a deposit of Pliocene to Early Pleistocene shallow marine sands, but that is uncertain from the data.

4.4.5 This unit is visible within the SBP data as an extensive, unstructured, acoustically transparent deposit with little or no internal features and a generally strong, irregular upper reflector. It is only present within the nearshore 20km of the Proposed Offshore Scheme, after which it is rapidly overlain by younger deposits.

4.4.6 The archaeological potential of Unit 1 depends on which Crag Formations are represented. For example, the Wroxham Crag Formation, the youngest of the Crag Group, was partially deposited during the Cromerian Stage which is possibly of archaeological potential. A layer of peat potentially from within Unit 1, or on its upper surface, has been identified within vibrocore VC_006 (but was not resolved within the SBP data). This would indicate a potential preserved land surface either within or directly on top of Unit 1, the archaeological potential of which would depend upon its age.

4.4.7 Unit 2 is visible in a relatively short section of the Proposed Offshore Scheme, and is characterised by multiple well defined, sub-parallel internal reflectors. Sediments recovered from vibrocore VC_018 suggest the unit comprises high strength silty clay, and the unit has been interpreted as being the Westkapelle Ground Formation.

4.4.8 The boundary between Unit 1 and Unit 2 is unclear, with no distinct horizon identified within the data, and the units are distinguished by their very different internal acoustic character. However, this lack of definite stratigraphic relationship between the two units does not aid in determining which of the Crag Group formations is represented by Unit 1.

4.4.9 The Westkapelle Ground Formation is deposit of marine clays that is considered too old to be of archaeological potential. As such, Unit 2 is not considered to be of archaeological potential.

4.4.10 Moving further offshore, Unit 2 is rapidly replaced by Unit 3 which becomes the dominant shallow geological unit for much of the Proposed Offshore Scheme. This is characterised in SBP by a variable acoustic signature, which is relatively unstructured in some areas and contains internal features in others. The basal reflector is relatively strong and irregular and has been found by vibrocoring (e.g. VC_031) to be a layer of soft clay, potentially an upper weathered surface of the underlying stuff clays of Unit 2.

4.4.11 Unit 3 itself has been found in multiple vibrocores to comprise a significant deposit of silty and clayey sands and is interpreted to be the Yarmouth Roads Formation. The Yarmouth Roads Formation is of variable archaeological potential. The upper layers of the Formation are contemporaneous with the terrestrial Cromer Forest Bed Formation at Pakefield and Happisburgh and so has the potential to be of archaeological interest where terrestrial features (e.g. buried palaeochannels) are present. However, no such features distinct enough to be confidently mapped are visible within the SBP data and, as such, the bulk of Unit 3 is not considered to be of archaeological potential.

4.4.12 Unit 4 is the dominant shallow geological unit at the north-eastern end of the study area, and is an extensive unit characterised by faint internal reflectors within the SBP data. Numerous vibrocores have found this unit to be characterised by dense shelly sand, and it is interpreted as the Ipswichian age Eem Formation. As a fully marine deposit, this is not considered to be of archaeological potential.

4.4.13 Unit 5 is the dominant shallow geological unit for the central section of the Proposed Offshore Scheme, This unit is characterised by well defined, sub-parallel internal reflectors, and can be present as a blanket deposit, channel fill, or upstanding bank formations. This is interpreted as the Brown Bank Formation, which has been sub-divided into three sub-

units from vibrocore analysis (**Table 7**, **Section 4.5**), but these sub-units have not been definitively identified within the SBP data and so they are all classed as a single Unit 5 for the purposes of the SBP assessment results.

4.4.14 The Brown Bank Formation comprises shallow water deposits ranging from shallow marine through estuarine to restricted embayment/lagoon deposits, ranging in age from the Early to Mid-Devensian. Based on this, it is interpreted that the blanket deposits represent a more open marine environment, and so is of relatively low archaeological potential, whilst the more restricted channel-like deposits represent a more land-proximal environment and therefore may be of both archaeological and palaeoenvironmental interest.

4.4.15 A number of individual palaeogeographic features associated with Unit 5 have been identified within the SBP data (see **Appendix 3** for full list). These are presented as a number of different feature types, such as channels, cut and fills, and banks. The channel features, for example **75027** and **75033**, are distinct features with strong, irregular basal reflectors and fill characterised by multiple internal parallel reflectors (**Figure 4**). These have been found by vibrocoring (e.g. VC_068) to contain a fill of soft to firm clay and clayey silt. These channel features are considered of the highest archaeological potential of the Unit 5 features.

4.4.16 A number of features identified from within Unit 5 have been classified as cut and fills (e.g. **75031**, **75035**; see **Appendix 3** for full list). These are generally less well defined than the channel features, with weaker basal reflectors and less developed internal reflectors, and can be either simple or complex (i.e. contain one or multiple phases of fill). These could represent further channel features, but they may also be the edges of blanket deposits and so are considered of lower archaeological potential.

4.4.17 One distinct bank feature, **75028**, comprising acoustically layered sediment overlying a well-defined basal reflector has been identified and interpreted as a Unit 5 deposit. This was found by vibrocoring (VC_039) to comprise soft to firm sandy silty clay. The archaeological potential of this feature is less certain, but it has been assigned a medium potential rating for the purposes of this assessment.

4.4.18 Two areas of acoustic blanking, **75042** and **75049**, were identified within the blanket deposit of Unit 5. These are potentially caused by accumulations of shallow gas, suggesting the presence of organic material within the sediment. Whilst not of archaeological potential in themselves, this could indicate these areas of sediment are of possible palaeoenvironmental interest due to the possible preservation of organic matter.

4.4.19 Unit 6 represents the remnant sediments present within the study area that record the terrestrial environment present prior to the Holocene marine transgression and has been divided into 4 sub-units.

4.4.20 Unit 6a is present within the SBP data as multiple channel and cut and fill features (see **Appendix 3** for full list). The channel features are visible cutting into the underlying stratigraphy, generally Unit 1 in the nearshore and Unit 3 further offshore, and generally have a well-defined basal reflector with either acoustically well layered or unstructured fills. The cut and fills are similar but less well-defined in their appearance and are unable to be traced across multiple lines, and so their precise natures are uncertain. None of the interpreted Unit 6a channel or cut and fill features have been sampled by vibrocoring.

4.4.21 Of particular interest of Unit 6a is channel feature **75020** (**Figure 5**). This is a distinct feature potentially cut into the boundary between Unit 2 and Unit 3 and characterised by parallel

internal reflectors. This feature correlates with the southern extent of an interpreted Early Holocene channel identified during regional work associated with the Palaeo-Yare catchment and Aggregate Area 240 archaeological finds approximately 15 - 20km to the north (Tizzard *et al.* 2014, 2015).

4.4.22 In the nearshore, two identified channel features (**75000** and **75006**) potentially represent the remnants of the offshore course of the River Blyth, that enters the sea just to the north of landfall, but this is uncertain. Channel **75000** contains areas of acoustic blanking, suggesting the presence of preserved organic material.

4.4.23 All the interpreted channel features of Unit 6a are interpreted to be of high archaeological potential as they are the remnants of a terrestrial land surface but feature **75020** is of particular potential due to its direct association with Area 240. As less certain features, the cut and fills of Unit 6a are considered to be of medium archaeological potential.

4.4.24 Unit 6b is interpreted as various disconnected peat/organic layers that are interpreted to have been created prior to marine transgression. Within the nearshore area, this is represented by feature **75015** – a distinct reflector found by coring (VC_005 and VC_006) to comprise peat and organic clay (**Figure 6**). VC_005 and VC_202 suggest it is also likely that the bases of features **75008** and **75010** (part of Unit 6c) also contain peat. Due to its relatively shallow depth close to shore, it is likely that these peats are Holocene in age, but further work would need to be carried out to confirm or disprove this.

4.4.25 Further offshore, multiple areas of high amplitude reflectors (see **Appendix 3** for full list) have been identified at the base of the seabed sediments, directly overlying Unit 5. Samples from vibrocores VC_111 and VC_128 suggest these are likely to represent deposits of organic clay and peat. Many of these features are located between and in the vicinity off the Norfolk Vanguard East and West and Norfolk Boreas wind farm array areas, and it is likely that these high amplitude reflectors are directly related to the extensive buried terrestrial deposits (comprising peat layers, channels, and buried dunes) that were identified as part of assessments related to these projects (Wessex Archaeology 2017, 2018c).

4.4.26 As remnants of past land surfaces, and as likely preserved organic and palaeoenvironmental material, the organic layers of Unit 6b are considered to be of high archaeological potential and have the potential to contain both *in-situ* and derived archaeological and palaeoenvironmental material.

4.4.27 Unit 6c has been identified within the SBP data in the nearshore area only, where it is represented by two extensive features - **75008** and **75010**. These are distinct deposits characterised by a generally distinct, low relief basal reflector, and a single phase of acoustically well-layered fill (**Figure 7**). These have been found by multiple vibrocores (e.g. VC_177 and VC_180) to represent fine grained deposits, generally soft clays, silts, and sands with organic material. The basal reflector has also been found to be organic/peaty in places (Unit 6b). Five areas of acoustic blanking (**75009**, **75011**, **75012**, **75013**, and **75014**) identified within these features and likely to be the result of shallow gas indicate the presence of organic material within these sediments.

4.4.28 These sediments are potentially of estuarine and/or intertidal origin, deposited on top of previous land surfaces (i.e. the basal organic layer) during sea level rise in the Holocene. Due to this potential coastal environment, and due to the likelihood of organic material preservation, these features are considered to be of high archaeological potential.

4.4.29 Unit 6d, interpreted as a terrestrial head deposit, has not been identified within the SBP data. This unit is described in more detail in **Section 4.5**.

4.4.30 Unit 7 is represented in the SBP by seven distinct features (**75016**, **75017**, **75019**, **75025**, **75026**, **75063**, and **75064**). These are generally relatively small-scale mounded features located at the interface between the superficial seabed sediment (Unit 8) and the underlying units, and so are surrounded by seabed sediments, and characterised by multiple dipping internal reflectors. The basal and upper reflectors are generally relatively distinct, and the features themselves are mainly laterally limited.

4.4.31 These have been interpreted as possible buried and preserved bank and/or dune features created during the Holocene marine transgression. As they are relatively small scale they have been interpreted as of medium archaeological potential, with the exceptions of **75016**, **75017**, and **75063** which are interpreted as high archaeological potential due to their better developed for and more extensive size.

4.4.32 Although these are interpreted as transgression features, and have been classified as Unit 7, this chronology doesn't quite apply to feature **75016** which appears to be situated chronologically between organic deposit **75015** (Unit 6b) and fine-grained deposit **75010** (Unit 6c) (**Figure 6**). This is also the largest of the bank features, and it may be that it represents a relict coastal barrier with the fine-grained deposits of Unit 6c representing lagoon/tidal estuary/marsh deposits, suggesting that Unit 6c and Unit 7 are at least partially contemporaneous. Potential analogous features can be seen further south down the modern East Anglia coast around Orford Ness. As such a distinct landscape feature, **75016** would be considered of high archaeological potential. However further work, such as dating of the peats and associated sediments of the area, would be necessary to fully understand the chronology.

4.4.33 The youngest unit within the study area is Unit 8, which represents the modern seabed sediment. This is present throughout the study area, and ranges in thickness from a thin veneer to large sand waves many metres in height. As a modern deposit, Unit 8 is not considered of archaeological potential in itself, but it has the potential to protect underlying land surfaces (such as the high amplitude reflectors further offshore) and bury modern archaeological sites (e.g. shipwrecks) in areas where it is mobile and attains sufficient thickness.

4.5 Geoarchaeological Assessment Results

4.5.1 A total of 224 vibrocore logs were reviewed as part of Stage 1 works, with the aim of identifying deposits of potential geoarchaeological interest with recommendations for further geoarchaeological work, if necessary. Full details are presented in *LionLink Stage 1 Geoarchaeological Review of 2024 Offshore Geotechnical Data* (Wessex Archaeology, 2025), including an outline description based on geotechnical logs presented as an appendix.

4.5.2 A summary of the deposits encountered is provided below and in **Table 7**, and the assigned geoarchaeological priority is shown in **Figure 8a-l**. Due to the completion of the SBP assessment and the incorporation of these results into the stratigraphy, the Units outlined here differ from those previously provided in the standalone Stage 1 assessment report (Wessex Archaeology 2025). This is to be expected with the addition of new data.

4.5.3 Following Stage 2 geoarchaeological recording, a series of deposits recovered from vibrocores located within the nearshore were reinterpreted as undifferentiated Crag Formations (Unit 1) and the Westkapelle Ground Formation (Unit 2). Unit 1 and Unit 2 were

also identified in SBP data from the nearshore (see **Section 4.4**). These reinterpretations do not impact the discussion and recommendations outlined in the Stage 1 review (Wessex Archaeology 2025) and will be detailed in the Stage 2 geoarchaeological recording and deposit modelling report (submitted as part of the PEIR and will inform the ES).

Yarmouth Roads Formation

4.5.4 A number of sediments recovered in vibrocores comprise silty, occasionally gravelly sands with thin beds of stiff clay, pockets of organic material and various amounts of fragmented shells. These sediments are interpreted as forming part of a deltaic complex, corresponding to the Lower to Middle Pleistocene deposits of the Yarmouth Roads Formation (>MIS 13) (Unit 3).

4.5.5 The frequency of shell within deposits of the Yarmouth Roads Formation suggests that these sediments represent the more distal part of the deltaic complex in shallow water, which, if reflective of a fully marine, rather than an estuarine environment, may not have been suitable for inhabitation. However, in the nearshore area, these deposits are characterised as shell-free, well-sorted and fine-grained, which indicates that deposition may have occurred in a low-energy fluvial or alluvial environment likely to be rich in resources that could be exploited by early human groups. Most importantly, the grey sands in VC_006 contain beds of reworked peat. Further investigation is however required to determine if these grey sands and peats are Cromerian in age or younger.

4.5.6 The shelly sands typically associated with the Yarmouth Roads Formation are assigned a low priority status. However, the well-sorted fine sands in the nearshore which may represent channel fill deposits are assigned a medium priority status.

Eem Formation

4.5.7 Based on BGS mapping of geological formations, a number of vibrocores located toward the offshore extent of the study area containing shelly brown dense sands have been interpreted as the Eem Formation (Unit 4). The Eem Formation, as defined by BGS (Stoker et al., 2011) represents deposition in fully marine conditions during the Ipswichian interglacial (MIS 5e). The palaeolandscape of the southern North Sea during this period would have been dominated by fully marine or shallow marine conditions and therefore sediments have low preservation potential for palaeoenvironmental and/or archaeological material and are assigned low priority status.

4.5.8 Interestingly, these dense marine sands of the Eem Formation are frequently overlain by organic silts and sands which are typically recorded between seabed and 1.00 mbsf. Organic deposits dating to the Late Glacial to early Holocene and associated with palaeochannel features are widely recorded across the wider study area (Wessex Archaeology 2019a; 2019b); however, these sequences are unique, in that they diffusely grade through to the upper organic sediments. This suggests that these organic silts and sands may immediately post-date MIS 5e, representing the initial fall and stabilisation of the landscape following marine regression. Assuming an age of MIS 5e-d, it is possible these deposits are broadly contemporaneous with estuarine and fluvial sediments identified in Area 240 (Unit 4; Tizzard *et al.,* 2014) from which late Middle Palaeolithic handaxes may have been recovered (Shaw *et al.,* 2023).

4.5.9 Moreover, it is possible that the upper organic deposits could be contemporary with the Upper Brown Bank Formation, representing the margin of the lagoon which covered an extensive area during MIS 5d-3. These upper organic deposits are therefore assigned a medium priority status.

Brown Bank Formation

4.5.10 Unit 5a comprises greenish grey fine to coarse occasionally gravelly sands with faint laminations and represents the Lower Brown Bank dating to MIS 5e-3. This units corresponds to marine regression following the last interglacial highstand with deposits representing deposition in either an intertidal or shallow marine environment (Limpenny *et al.*, 2011). The archaeological and/or geoarchaeological potential of these deposits is unclear but may represent intertidal conditions and thus have been assigned a medium priority status.

4.5.11 Unit 5b comprises high strength greenish grey sandy silty clay and clayey silt with shell fragments and laminae of sand and represents the Upper Brown Bank, dating to the Early/Middle Devensian (MIS 5d-3; Limpenny *et al.,* 2011; Wessex Archaeology 2018a; 2018b). The Upper Brown Bank is interpreted as a shallow lagoon/embayed environment, however the fine-grained nature of the sediments, coupled with occasional thin laminations, beds and pockets of organics and shell inclusions, suggests a variable and complex depositional history (e.g. influence by tidal regime or other currents).

4.5.12 Although the Upper Brown Bank is of potential archaeological significance with low-lying shores presenting opportunities for occupation and exploitation, the deposits recovered have been assigned a low priority status as previous microfaunal assessments undertaken on these clay-rich sediments in the wider study area (Wessex Archaeology 2019a; 2019b) suggest deposition occurred in a shallow embayment which would have been unsuitable for occupation.

4.5.13 Unit 5c is recorded as stratigraphically overlying the clays and silts of the Upper Brown Bank Formation (Unit 5b) and is interpreted as estuarine to intertidal sediments, characterised by slightly gravelly fine to coarse sands with shell fragments and laminae to thin beds of silt and clay. The unit is lithologically similar to the Lower Brown Bank deposits but contains less shell. This, combined with the stratigraphic position and diffuse lower boundary of these sands suggests that Unit 5c could represent increasing depositional energy in response to the regression of the lagoonal feature. The archaeological and/or geoarchaeological potential of Unit 5c is unclear, however, it has been assigned a medium priority status, reflecting the potential palaeolandscape dynamism that it captures.

Fluvial Sands and Gravels/Alluvial Sands

4.5.14 Unit 6a comprises strong orangish brown gravelly sands and sandy gravels, and often laminated fine to coarse sands, interpreted as high-energy fluvial to low-energy alluvial deposition, respectively. The age of these fluvially-derived sediments is unclear; however, they typically overly grey sands of the Yarmouth Roads and may, therefore, post-date them. However, the nature of their relationship to the Yarmouth Roads is unresolved at present. Correlation to river terrace deposits onshore is complex and not always possible for matrix-supported fluvial sands, requiring sufficient gravel clast samples for clast lithology to be undertaken (stone counts), and altitudinal mapping of terrace units for direct correlation. Despite this, based on modern geography, it is possible that these fluvial sediments offshore may be related to the offshore continuation of the palaeo-Blythe. Alternatively, these deposits may form part of an unidentified channel in the nearshore area of the Proposed Offshore Scheme. This unit is assigned a medium priority status.

Peat

4.5.15 Unit 6b is characterised as dark brown peat and was identified in two vibrocores located in the nearshore (VC_005 and VC_006 and a single vibrocore located further offshore (VC_128). Pockets of peat were recorded in VC_006, whereas the peats in VC_005 and

VC_128 were recovered as in situ units. The absolute age of these peats is uncertain, however equivalent organic deposits have been recovered in the nearshore area off Walberswick which are suggested to compare to the peat deposits at Southwold town marshes, radiocarbon dated to between 6755–6510 BP and 4575–4300 BP (Late Mesolithic-Early Bronze Age).

4.5.16 The peat deposits have the highest potential for preserving material for radiocarbon dating, along with a range of palaeoenvironmental remains (e.g. pollen and plant macrofossils) suitable for reconstructing past landscape and environmental change, and investigating evidence for human activity during the Mesolithic, or possibly the Palaeolithic.

Organic Interbedded

4.5.17 Peat in the nearshore is overlain by very organic interbedded sands, likely indicative of deposition in an estuarine, intertidal or shallow marine environment (Unit 6c). Due to the high organic and bedded nature of the nearshore deposits, they have also been assigned a high priority status.

4.5.18 Organic interbedded deposits are also widely recorded typically overlying Units 5b/5c of Brown Bank. Shell fragments are occasional to frequent in these deposits and the upper surface diffusely grades to modern seabed sediments, which indicates these deposits represent the progressive inundation of the North Sea during the early Holocene. This indicates that these deposits are equivalent to the intertidal to shallow marine deposits identified within the Norfolk Vanguard and Boreas offshore windfarms (Wessex Archaeology 2019a; 2019b) located immediately adjacent to the Proposed Offshore Scheme. The organic content and structure of these deposits is variable, with both reworked and in situ beds of fine-grained material recorded. As the organic content is considerably lower than the equivalent nearshore deposits, they have been assigned a medium priority status.

Head

4.5.19 Unit 6d comprises soft brown slightly gravelly and sandy clays. This lithologically variable deposit suggests that a degree of reworking has been undertaken. The lower boundary in both vibrocores is sharp and erosive in nature, which is more characteristic of Head as opposed to alluvium which has been reworked by later marine processes. Although the depositional history of this deposit is unclear, based on the reworked nature it has been assigned a low priority status.

Possible dunes/banks

4.5.20 Unit 7, described as small features within seabed sediment and interpreted as representing possible dunes/banks, was identified in the SBP geophysical data (**Table 7**) but not definitively recovered in any of the geotechnical vibrocores from the Proposed Offshore Scheme.

Seabed Sediments

4.5.21 Unit 8 is predominantly characterised by shelly sands, although may be gravelly in places. These seabed sediments are present across the study area and mark the final submergence of the formerly terrestrial North Sea landscape and the prevalence of fully marine conditions.

4.6 Setting

4.6.1 The setting of seabed prehistory features is integral to their value and importance. Although there are no views to the features nor ways they can be experienced on the seabed, their

position is critical to how palaeolandscapes were exploited and experienced by past peoples, and their non-visual setting includes international research into the Palaeolithic and Mesolithic periods across Europe. If further relevant information regarding these features becomes available in the future, then an assessment of their setting may be undertaken

4.7 Value

4.7.1 There are no designated or known seabed prehistory sites within the study area. However, the results of the palaeogeographic assessment together with the archaeologically assessed cores taken for the Proposed Offshore Scheme have demonstrated the potential for the discovery of material relating to seabed prehistory.

4.7.2 On the basis of age and the rarity of Palaeolithic and Mesolithic finds in marine contexts, if any sites or material was discovered, they would likely be of high, probably national, archaeological importance. A guidance note published by English Heritage (now Historic England) *Identifying and Protecting Palaeolithic Remains: archaeological guidance for planning authorities and developers* (1998) indicated that sites containing Palaeolithic features are so rare in Britain that they should be regarded as of national importance and wherever possible should remain undisturbed. This was reiterated in Historic England's 2023 guidance, *Curating the Palaeolithic* (2023a).

5 MARINE ARCHAEOLOGICAL ASSESSMENT: MARITIME, AVIATION SITES AND GEOPHYSICAL ANOMALIES OF ARCHAEOLOGICAL POTENTIAL

5.1 Introduction

5.1.1 The following assessment for the maritime and aviation marine archaeological baseline resource will predominantly be based on the assessment of geophysical data to identify features of archaeological potential relating to maritime and aviation activity. This information is supplemented with records of known shipwrecks, aircraft crash sites and obstructions to provide an overall baseline of the study area. The distribution of the known heritage receptors is illustrated in **Figure 9a-t**.

5.1.2 As well as summarising the known archaeological resource, the baseline assessment underlines the potential for encountering shipwreck and aircraft crash sites within the study area. Relevant primary and secondary source material has also been utilised to understand the nature of maritime and aviation activity of the region.

5.1.3 The overall aim is to establish the known and potential marine archaeological resource that could be affected by the Proposed Offshore Scheme.

5.1.4 The baseline information presented here has been gathered following the best practice professional guidance outlined by the CIfA's *Standard and Guidance for Historic Environment Desk-Based Assessment* (2014a, updated 2020).

5.2 Protected Sites

5.2.1 Wrecks protected under the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1978 are marked on appropriate UKHO Admiralty Charts. Interference or damage to these wrecks is considered a criminal offence.

5.2.2 There are currently no maritime or aviation sites within the study area that are subject to statutory protection from these acts that can be used to protect marine archaeological sites.

5.2.3 There is one known recorded aircraft crash sites located within the study area (WA **2036**), which was salvaged and lifted in 1983 and not relocated in 1988.

5.2.4 There are no further record aircraft crash sites located within the study area; however, it is possible that the anomalies given the archaeological discrimination A2 described in the geophysical seabed features assessment results below could relate to such sites. All aircraft that crashed while in military service are automatically protected under the Protection of Military Remains Act 1986. If present within the study area, such sites would represent statutory constraints upon the proposed development. This legislation means any activities impacting upon the aircraft remains must cease pending assessment by the Ministry of Defence.

5.3 Charted Maritime Records

5.3.1 The following section includes 36 features recorded in the UKHO, NMHR and HER datasets that are located within the study area (**Figure 9a-t**). These have no geophysical survey data coverage (see **Section 5.4**) and have therefore not been merged with the geophysical seabed features gazetteer (see **Appendix 5**). These sites are summarised below and full details presented in **Appendix 4**.

5.3.2 There are 24 records consisting of wrecks, of which 13 are named wrecks, while the rest are unidentified. Eight of the named wrecks are listed as ‘dead’ by the UKHO, i.e. not detected by repeated surveys, therefore considered to not exist. However, possible remains of these sites could still lie on or buried in the seabed. Of the named wrecks, seven date to between 1914-1922, one dates to 1940, and the remaining four are modern (1970 - 2005). First World War casualties consist of British steamships and merchant ships, and a Norwegian and Belgian vessel. These were either struck by or struck a mine or were captured and sunk by German submarines. The one record dating the Second World War is that of an Italian steamship that was torpedoed en route from Marseille to Hartlepool. The rest of the records relate to modern fishing or cargo vessels.

5.3.3 Eleven records relate to obstructions or foul ground, three of which have been identified as fishermen’s fasteners and of the 11 records nine are listed as ‘dead’ by the UKHO, i.e. not detected by repeated surveys, therefore considered to not exits.

5.3.4 There is one UKHO record of an aircraft crash site (**2035**), that was located at a general depth of 38 m. However, its identification is unknown, and the record shows that it was salvaged and lifted in 1983. This was not located in a survey carried out in 1988 and therefore listed as ‘dead’ by the UKHO, i.e. not detected by repeated surveys, therefore considered to not exist. An obstruction (**2034**) is located approximately 300 m due north of the UKHO position for **2035**; this could possibly pertain to the same site.

5.4 Geophysical Seabed Features Assessment

5.4.1 The geophysical data were assessed to identify features of archaeological potential relating to maritime and aviation activity.

5.4.2 The different survey specifications of data have been collated into a single gazetteer detailed in **Appendix 5** of this document. The data set and study area that each anomaly has been identified in has been recorded within the gazetteer in **Appendix 5** and not generally stated within this report text.

5.4.3 Where anomalies were interpreted solely from the SSS mosaic geotiffs, height measurements will not be available. Where height measurements are present, these have been taken from the Raw SSS data during checks of significant anomalies or have been taken from the MBES data. Within the gazetteer, the presence of a shadow for an anomaly seen on a SSS geotiff is mentioned in the text and is indicative of height.

5.4.4 For the purposes of this assessment, we consider that magnetic anomalies closer to the flown Mag. line will have an increased likelihood of being detected. Larger or denser objects of ferrous material may be detected from further away, but smaller items may not be detected (see **Section 3.5.17**).

5.4.5 Anomalies identified in the Mag. datasets have been classified according to magnetic amplitude. Those with a very large amplitude of over 500 nT have been classified as A1. Anomalies with a large amplitude between 100-499 nT have been classified as A2_h and those with a small or medium amplitude between 5-99 nT have been classified as A2_l.

Seabed features assessment results

5.4.6 The results of this assessment are collated in gazetteer format detailed in **Appendix 5** of this document and illustrated in **Figure 9a-t** and **Figure 10**.

5.4.7 A total of 289 anomalies have been identified as being of possible archaeological potential within the Draft Order Limits and are discriminated as shown in **Table 8**.

Table 8 Anomalies of archaeological potential within the study area

Archaeological discrimination	Quantity	Interpretation
A1	0	Anthropogenic origin of archaeological interest
A2_h	26	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature
A2_l	260	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature
A3	3	Historic record of possible archaeological interest with no corresponding geophysical anomaly
Total	**289**	

5.4.8 Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance (**Table 9**).

Table 9 Types of anomaly identified within the study area

Anomaly classification	Definition	Number of Anomalies
Linear debris	Distinct linear objects on the seabed, either straight or curved, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin. May represent linear anthropogenic debris which can include, for example, lengths of rope or chain or abandoned fishing gear.	4
Debris	Distinct objects on the seabed, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin	3
Seabed disturbance	An area of disturbance, occasionally containing objects of uncertain origin. May indicate wreck debris or other anthropogenic features, or items buried just below the seabed, but lacking any definite anthropogenic structures. Precise nature is uncertain.	14

Anomaly classification	Definition	Number of Anomalies
Bright reflector	Individual objects or areas of low reflectivity, characteristic of materials that absorb acoustic energy, such as waterlogged wood or synthetic materials. Precise nature is uncertain	1
Dark reflector	Individual objects or areas of high reflectivity, displaying some anthropogenic characteristics. Precise nature is uncertain	36
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris.	17
Magnetic trend	A continuous trend in the magnetic data, or a trend comprising individual magnetic anomalies which appear to be associated, with no associated seabed surface expression or feature. Has the potential to represent possible ferrous debris.	2
Magnetic	No associated seabed surface expression, and have the potential to represent possible buried ferrous debris or buried wreck sites	209
Recorded wreck	Position of a recorded wreck at which previous surveys have identified definite seabed anomalies, but for which no associated feature has been identified within the current data set.	2
Recorded obstruction	Position of a recorded obstruction (e.g. foul ground, fisherman's fastener recorded by the UKHO), but for which no associated feature has been identified within the current data set	1
Total		**289**

5.4.9 No features within the study area have been discriminated as A1 - Anthropogenic origin of archaeological interest.

5.4.10 A total of 26 anomalies within the study area have been discriminated as A2_h - anomalies of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature.

5.4.11 Four A2_h anomalies (**7093**, **70113**, **70229** and **70231**) have been classified as linear debris. These anomalies range in length from 24.7 x 0.1 m (**70229**) up to 68.3 x 0.4 m (**70113**).

5.4.12 One of these features (**70113**) has an associated magnetic amplitude (18 nT) indicating the presence of some ferrous material along its length.

5.4.13 Based on their form in the data all of these are interpreted to be lengths of linear debris such as rope, chain or fishing gear, and may be modern in origin, though this cannot be confirmed without visual inspection.

5.4.14 Three A2_h anomalies (**70003**, **70034** and **70241**) have been classified as individual pieces of debris. These anomalies range in size from 3.9 x 0.4 x 0.6 m (**70003**) up to 8.4 x 21. M (**70034**). None of these have an associated magnetic amplitude. All have been interpreted as debris due to their appearance in the data, and all have the potential to be modern and are therefore discriminated as A2_h, rather than A1 anomalies.

5.4.15 One A2_h feature (**70174**) has been classified as a mound and was identified in the MBES data set as a distinct ellipse, measuring 31.4 x 17.1 x 1.0 m (**Figure 9d** and **Figure 10**). This feature was also tentatively visible in the SSS mosaic as an area of bright reflector. Due to its distinctive appearance in the data, this feature has been interpreted as potentially buried debris. Although it may also be a natural feature, the archaeological discrimination has been elevated to A2_h.

5.4.16 A total of 18 A2_h anomalies (for full list see **Appendix 5**) have been classified as magnetic only anomalies, none of which have a clearly corresponding anomalous SSS or MBES feature associated.

5.4.17 These anomalies range in amplitude from 109nT (**70138** and **70157**) up to 333nT (**70139**) and all are considered to represent possible ferrous debris that is either buried or has no surface expression. These anomalies have been discriminated as A2_h primarily on amplitude, suggesting a significant amount of ferrous material may be present at these locations.

5.4.18 A total of 260 anomalies within the study area have been discriminated as A2_l - anomaly of possible anthropogenic origin but the interpretation is uncertain; may be anthropogenic or a natural feature.

5.4.19 A total of 14 A2_l anomalies (for full list see **Appendix 5**) have been classified as a seabed disturbance. These features are varied in shape and range in size from 6.2 x 6.0m (**70213**) up to 63.4 x 20.9 x 0.7m (**70211**). None of these features have an associated magnetic anomaly. All these seabed disturbances are uncertain in origin and all have been interpreted as having the potential to be possible debris or may be natural features.

5.4.20 It is noted that in the gridded MBES data and in the SSS mosaic, anomaly **70211** has a generally elliptical outline and an appearance consistent with a severely degraded wreck. However, when this location was assessed in the 'Raw SSS' data, this feature appeared to look more natural in origin. No anomalous magnetic amplitudes were associated with this location. As this feature appears on a similar alignment to features visible to the north that are interpreted as exposed natural material, this feature is interpreted as more likely to be a possible natural feature and therefore has been given a lower archaeological discrimination of A2_l (**Figure 9i** and **Figure 10**).

5.4.21 One anomaly (**70165**) has been classified as a bright reflector. This was identified in the SSS mosaic measuring 6.9 x 0.7m and has been interpreted as a possible natural feature or possible debris.

5.4.22 A total of 36 A2_l anomalies (for full list see **Appendix 5**) have been classified as dark reflectors. These anomalies vary in shape and range in size from 0.7 x 0.2m (**70002**) up to 33.6 x 0.7m (**70278**). None of these anomalies have an associated magnetic amplitude. All been interpreted as having the potential to be possible debris or may be natural features.

5.4.23 A total of 16 A2_l anomalies (for full list see **Appendix 5**) have been classified as mound features. These features vary in shape and range in size from 5.0 x 3.8 x 0.4m (**70180**) up to 57.7 x 3.5 x 0.4m (**70235**). None of these features have an associated magnetic amplitude. All these features are uncertain in origin, and all have been interpreted as possible natural features or possible buried debris that may be covered with seabed sediments.

5.4.24 Two A2_l anomalies (**70188** and **70201**) have been classified as magnetic trends, with no corresponding anomalous SSS or MBES features associated along their lengths. Anomaly 70188 is aligned north-east to south-west extending for 185.3m, with a maximum amplitude of 22nT.

5.4.25 Anomaly **70201** is aligned north-east to south-west extending for 345m, with a maximum amplitude of 39nT.

5.4.26 Both these magnetic trends have the potential to represent ferrous material (possibly modern, such as fishing gear), either buried or with no surface expression, and have been discriminated as A2_l primarily on amplitude.

5.4.27 A total of 191 A2_l anomalies (for full list see **Appendix 5**) have been classified as magnetic only anomalies, none of which have a clearly corresponding anomalous SSS or MBES feature associated. These range in amplitude from 5nT (**70050**, **70070**, **70091**, **70116**, **70123**, **70132** and **70154**) up to 99nT (**70144** and **70242**). All may represent possible ferrous debris that is either buried or has no surface expression, and all have been given a lower archaeological rating based primarily on amplitude and may also represent natural features.

5.4.28 Three historic records have been identified either within, or with recommended mitigation that would impact, the Proposed Offshore Scheme and have been discriminated as A3 - historic record of possible archaeological interest with no corresponding geophysical anomaly.

5.4.29 Record **70090** represents the reported location of the British steamship *Rochester City* which sank on 2 May 1916 after hitting a mine. Although this position is located outside of the Draft Order Limits (**Figure 9b**), and was therefore not covered by geophysical data, the corresponding UKHO report (10362) indicates that the wreck was last observed in 2017 as largely intact and partially buried. As no further comment can be made on the condition of the wreck at this time, a 100m Archaeological Exclusion Zone (AEZ) is recommended which would impact an area within the Draft Order Limits, and therefore this record has been retained within the gazetteer.

5.4.30 Record **70098** represents the reported location of the British steamship *Sunniside* which sank on 9 November 1916 after hitting a mine. The corresponding UKHO report (10365) indicates that the wreck was not observed at this location in 2017. Although this position is located outside of the Draft Order Limits (**Figure 9b**), and was therefore not covered by geophysical data, no further comment can be made on the presence of the wreck in the vicinity at this time. Therefore, a 100m AEZ is recommended which would impact an area within the Draft Order Limits, and therefore this record has been retained within the gazetteer.

5.4.31 Record **70171** has been classified as a recorded obstruction and is the reported location of a 'foul ground' within the Draft Order Limits (**Figure 9d**). No anomalous features were identified in the geophysical data at this location and therefore this record is considered to be of low archaeological interest. It has been retained within the gazetteer for information purposes.

5.5 Setting and Value of Seabed Features

5.5.1 This section will assess the setting and value of the known and identified seabed features of a maritime nature identified within the study area. The value of the potential discovery of further maritime sites and aircraft crash sites will also be included.

5.5.2 The perceived setting and value assigned to an individual site is, to a large degree, site specific. A vessel or aircraft may be considered of special interest on the basis of any number of interrelating integral and relative factors, as discussed in the methodology section of this document.

5.5.3 The setting and value of the known, named wrecks can be taken into consideration. All of the sites have limited views due to being underwater, although some have been explored

by divers. Some of the wrecks are potentially buried or are considered 'dead' or ‘lifted’ by the UKHO (**2001** -**2006**, **2008** -**2010**, **2012**, **2014**, **2016**, **2019**, **2021**-**2023**, **2026**, **2028**-**2030**, **2032**, **2035**-**2037**) and therefore their underwater setting is further limited. Wrecks dating post-1945 (**2004**, **2015**, **2032**, **2035**, **2038**) are less likely to be of archaeological interest, and the wrecks of this date located in the study area are not considered to have associated archaeological value.

5.5.4 Twelve of the named vessels were lost during the First or Second World Wars, and therefore their non-visual setting is within the wider First World War and Second World War military landscape of the study area and beyond. This includes record **2007** of the British merchant steamship *Rochester City*, record **2011** of the British steamship *Rhineland,* which was mined in 1915 whilst en route from Middlesbrough to Nantes with a cargo of steel, and record **2018** of the Italian steamship *Maria Rosa,* which was lost after being torpedoed by a submarine.

5.5.5 The project East Coast War Channels in the First and Second World War (Fjordr, 2014) researched the spatial extent of navigation channels and minefields between the Thames and the Scottish border during both wars and evaluated the heritage assets that are associated with these channels. All these wreck sites are considered to have high archaeological value due to the importance of their military involvement during the wars. The East Coast War Channels could be considered heritage assets with value in their own right, as they can be spatially represented. The significance of the value of their setting, specifically within the area of study area, may also become apparent through the assessment of the collective military landscape and seascape, encompassing recorded onshore defence infrastructure and known losses or documented losses of maritime vessels or aircraft during the First and Second World Wars.

5.5.6 The specific loss events of these twelve named vessels also provide information to how their position setting can be understood: seven vessels were sunk by a mine from a German mine laying submarine (**2002**, **2007**, **2008**, **209**, **2011**, **2016**, **2030**), one vessel was torpedoed (**2018**), two vessels were lost following capture by a German submarine and sunk by explosives (**2028** and **2029**), one vessel sunk after foundering (**2012**), and one vessel went missing (presumed mined) (**2017**). While it is possible that the vessels could have drifted before sinking, it is also possible that the position on the seabed is in close proximity to the wrecking event. Each of these losses is very much a product of its location at the time of loss. For example, those seven vessels that sank following striking a mine were lost due to their unfortunate position within a mine field, and therefore reflects not only the circumstances of the war, but also the specific methods being used to target ships, and, depending on whether the ship drifted following the event, its position on the seabed could even still be in relatively close proximity to the mine or mine field.

5.5.7 It is not possible to assess the setting of the eleven un-named wrecks, eleven obstructions and foul ground, and 289 A2 geophysical anomalies, however, should further information come to light regarding their character, their associated setting and value should be reviewed. It is possible that these are associated with First World War or Second World War military maritime or aviation activity, and therefore become part of the broader military landscape that exists in the region, however without further information to identify these wrecks it is impossible to confirm at this time. At present, the setting associated with these assets cannot be experienced from land or within a wider marine landscape, and due to the generally limited visibility within UK waters, the experience of setting at their locations is likely to be limited to the immediate vicinity.

5.5.8 Furthermore, all wreck sites must be considered to have archaeological value, to a greater or lesser degree and, in accordance with the precautionary approach, the un-named wrecks are therefore considered as high value assets. Similarly, as the value of potential wrecks cannot be evaluated until they are discovered, potential wrecks of all periods should be expected to be of high value.

5.5.9 As there is insufficient information to assess the value of each individual unidentified anomaly identified in the geophysical assessment (A2), all these additional anomalies (totalling 289) must be considered to have high archaeological value until more information becomes available. It is possible that any of the A2 geophysical anomalies located within the study area could relate to maritime sites or aircraft crash sites and therefore, there is the potential for wreck or wreck debris to exist on the seafloor of the study area.

5.5.10 Aircraft are considered to have significance for remembrance and commemoration but also have an implicit heritage value as historic artefacts, providing information on the aircraft itself and also the circumstances of its use and loss (English Heritage (now Historic England), 2002: 2). On this basis, all potential aircraft sites are considered to be of high value.

5.5.11 Additionally, the value and setting of any currently unrecorded wrecks (maritime or aviation) discovered during pre-construction or construction activities for the Proposed Offshore Scheme would also be unknown and would need to be evaluated on a case-by- case basis.

5.5.12 Derived artefacts are likely to be of limited archaeological value as individual discoveries. However, the occurrence of a number of seemingly isolated objects within a particular area has the potential to indicate shipping routes or maritime battlegrounds, or possibly even indicate the presence of a hitherto unknown wreck site. Isolated maritime finds are, therefore, regarded as being of medium archaeological value. Isolated aircraft finds are considered as being of medium archaeological value as they may provide insight into patterns of historical aviation across the study area or indicate the presence of uncharted aircraft crash sites.

5.6 Maritime and Aviation Archaeological Potential

Introduction

5.6.1 The assessment of potential for the discovery of shipwreck, shipwreck-derived, aircraft and aircraft-derived material within the study area draws on the results of the desk-based research combined with further research of the wider area.

5.6.2 There is potential for discoveries of maritime craft from the Mesolithic to the modern period. Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by the UKHO and others, thus recorded in the archaeological record. However, there is still potential for the discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey.

5.6.3 There is also potential for 20th century aircraft, particularly in relation to the Second World War. Aircraft crash sites are also difficult to identify through archaeological assessments of geophysical survey, although experience indicates material from the site, such as engines or other material may be recorded as small obstructions or anomalies.

Navigational hazards, seabed morphology and potential for preservation

5.6.4 A project entitled *Enhancing our Understanding: Mapping Navigational Hazards as Areas of Maritime Archaeological Potential*, undertaken by Bournemouth University (Merritt *et al.*, 2007) assessed historical records of navigational hazards to interpret and characterise the marine historic environment. Areas assessed to be hazardous were considered alongside a model of the preservation potential of marine sediments with the purpose of identifying areas where there was not only a high potential for ship losses, but where there was also a high potential for the preservation of archaeological remains. These areas were coined as Areas of Maritime Archaeological Potential (AMAPs).

5.6.5 The project records several navigational hazards within, and in proximity to the study area, as follows:

- Aldeburgh Bay – inshore bank hazard
- Thames Approaches – exposed offshore area
- Off Great Yarmouth – bank hazard

5.6.6 The study area traverses several coastal and offshore AMAPs (generally associated with the navigational hazards above) that are defined as having fine-grained sediments and therefore a high potential of preservation. The remaining study area covered by the Proposed Offshore Scheme comprises a mixture of the high potential fine-grained sediments and also further offshore, more coarse-grained sediments that have a lower potential of preservation.

5.6.7 The study area is generally considered to be an exposed coastal area with coastal approaches exposed particularly to the north-east and east, with shallow muddy foreshore and inshore banks. The study area also traverses through an offshore area that is considered to be exposed to all wind directions, which is proven by the substantial number of Recorded Losses for vessels that foundered as a result of poor weather conditions.

5.6.8 Due to this region being a heavily used shipping route around the UK, channel crossings and travel into London and also internationally, another hazard to maritime vessels would be collision. This is recorded on several records associated with Recorded Losses across the study area.

Recorded Losses

5.6.9 As discussed in the methodology section, Recorded Losses refer to ships and aircraft that are recorded as having been lost, but for which the exact locations are not known, and no material has been encountered on the seabed within the Named Location. The records for these losses provide additional documentary evidence for the potential discovery of sites and material relating to maritime and aviation activity within the study area.

5.6.10 A list of all maritime Recorded Losses in the vicinity of the study area are summarised in **Appendix 6** and **Appendix 7** and **Table 10**. The NMHR and Suffolk HER datasets have 52 records of Recorded Losses located within two Named location polygons that intersect with the boundary of the study area. This total comprises one battle (Battle of Solebay), four aircraft and 47 ships.

Table 10 Summary of Recorded Losses by date

Date	Number of records of ship losses	Number of records of aircraft losses
Pre-1500	2	Nil
1501 - 1815	28	Nil
1816 - 1913	18	Nil
1914 - 1945	Nil	4
Post-1945	Nil	Nil
Total	**48**	**4**

5.6.11 The Recorded Losses are categorised based on the date ranges used in the *Selection Guide Boats and Ships in Archaeological Contexts* (Wessex Archaeology, 2008b). Few ship losses are recorded prior to the beginning of the post-medieval period (c.1500), reflecting not only a significant increase in shipping from the post-medieval period onwards but also a general improvement in record keeping. Although the number of early Recorded Losses are low, their presence suggests the potential for the discovery of material relating to those early periods.

5.6.12 The Recorded Losses date from the early 16th century to the modern period, cover a wide range of vessel types and provide information about the causes of loss and reason for travel. The earliest records (NMHR_1450895 / 6) relate to two unknown English cargo vessels which foundered after being broken up and scuttled by local men, upon their arrival at Southwold, while the most recent comprises an English wooden ketch which foundered after collision (NMHR_914030).

5.6.13 Of the 52 vessels lost, a total of 46 records refer to named ships, which could allow for further research to be undertaken to perhaps better understand the location of these vessels now.

5.6.14 Records for 10 ships provide a date of build, a majority of which were built in the 19th century when more accurate records were being maintained and archived. There is still potential for earlier vessels to be discovered in the study area whose loss was simply not recorded.

5.6.15 Many of the records do not state a reason for the loss, giving only stranded, foundered or wrecked as a cause. The cause of loss can indicate whether there is potential for the remains of vessels to be discovered within the study area but also provides an indication of how vessels that were not recorded may also have been lost. Most of the Recorded Losses that do indicate a reason for the loss were caused by poor weather conditions and beaching or grounding. The most common cause of loss was due to bad wind conditions, clearly showing the weather conditions endured by maritime travellers.

5.6.16 Other commonly cited reasons for loss include collision, which clearly indicates both the density of maritime traffic present along this coastline and the dangerous nature of maritime travel at this time and also founding or stranding.

5.6.17 Trade routes are also provided on many of the records for most of the losses and show that vessels were travelling not only domestically around the coast but were also travelling further afield, for example to mainland Europe (Netherlands, Belgium and Spain), and Scandinavia.

Aircraft Recorded Losses

5.6.18 The aircraft Recorded Losses are particularly important as any aircraft lost while in military service is automatically protected under the Protection of Military Remains Act 1986, and therefore the discovery of remains from any of these aircraft would be protected.

5.6.19 The four Recorded Losses relate to three British bombers and one German junker aircraft lost during the Second World War. The three British bombers were returning from Magdeburg, Bremen, and Essen, respectively, and ditched off Southwold, Suffolk. The German JU88 Junker was shot down by a Mosquito Mk XVII and crashed three miles south of Southwold, Suffolk.

Potential for Unrecorded Maritime Archaeology

5.6.20 A maritime site may comprise an articulated or partially articulated shipwreck and / or associated debris of infrastructure. Debris can comprise a single artefact through to an entire scatter of material that was either accidentally or deliberately lost from a vessel. As an island nation, the UK has a long maritime history and as such there is potential for archaeological evidence of maritime sites since the area started to become inundated during the Mesolithic period through to the present day within the study area.

5.6.21 Many vessels were lost without a record being made and sometimes even records that were created have since been lost (Cant, 2013). Consequently, in addition to the charted seabed features and Recorded Losses discussed above, there is also the considerable potential for the discovery of archaeological material of a maritime nature, currently uncharted, to exist within the study area spanning from the Mesolithic period to the present day.

5.6.22 The exploitation of the marine environment could have begun in the Mesolithic (10,000-4000 BC) as the landscape of the study area would have been inundated from a terrestrial surface over multiple transgressions until the final gradual inundation mid-way through the Mesolithic when the study area would have become completely submerged.

5.6.23 The evidence for Mesolithic maritime craft is very sparse with the earliest example in Northern Europe coming in the form of a logboat from Pesse, Netherlands (c. 7920-6740 BC; McGrail, 2004: 173). The landscape of the study area would have been subject to a great change during the inundation of the Mesolithic period and undoubtedly would have provided a wetland / seascape suitable for logboats.

5.6.24 By the Neolithic (4000-2400 BC), the coastline and sea level was very similar to that of the present day. Marine traffic passing through the study area would most likely have been related to trade and the movement of people and domesticated animals, using such craft as logboats and hide boats. These vessels are through to have been predominantly used for short journeys and fishing, keeping close to the coastline, within rivers and inland water bodies. The discovery of a dugout boat thought to date to the Late Neolithic, at Westgate-on-Sea, Kent (Perkins, 1997: 7) highlights the potential for early maritime activity.

5.6.25 The Bronze Age (2400-700 BC) saw technological advances within Britain and North-West Europe that brought greater human interaction, resulting in the transference of materials, belief, concept, traditions and ideas, either reciprocal or forced (Agbe-Davies et al., 2010: 15-20). The maritime industry and boat building technology also advanced significantly during this period. The evidence for continental trade during this period is vast and widespread suggesting that regular organised crossings of the open ocean around Britain occurred during this time. It is possible that the Bronze Age sewn plank boat recovered from North Ferriby in the Humber Estuary (Wright *et al.*, 2001) and Dover, Kent is an example of

the type of vessel that could have been involved within this seafaring trade network (Clark, 2004: 210).

5.6.26 Although there are no vessels recorded within Britain during the Iron Age (700 BC-AD 43), the distribution of artefact types and the variety of examples found across North-West Europe suggests a high level of cross-channel trade and it is clear that from at least the Iron Age onwards, seagoing vessels passed through the study area (McGrail, 2004:176).

5.6.27 The Romano-British period (AD 43-410) brought with it considerable changes in many aspects of life within Britain. The evidence of this is widespread and can be seen in the archaeological record by way of the influx of new styles and materials. This is also believed to be the case in terms of maritime technology, which included the development of more substantial wooden vessels (Nayling *et al.*, 2004). The more substantial construction of vessels together with the increase in maritime traffic visiting the developed ports on the Suffolk coasts and rivers, would suggest that there is certainly potential for Romano-British material to be recovered from within the study area.

5.6.28 Along with the scale and variety of maritime activity that was being undertaken within North-West Europe, some of the most important maritime technological advances occurred during the Anglo-Saxon and medieval periods (AD 410-1500). For instance, the development of several phases of specialised boat building techniques, each of which came from the influence of foreign technologies and ideas. Vessel types included logboats for transport along inland waterways, to larger planked boats propelled by oar or sail and used for estuary, coast or cross-channel work (Milne, 2003). Remains of a 7th century dugout have been found at Walthamstow and dated to the 7th century AD (Marsden, 1996: 222), and remains of a clinker-built sea-going vessel have been identified at Graveney (Care-Evans *et al.*, 1971: 89-96), other clinker-built vessels include the boat burials of Sutton Hoo and Snape (Carver, 1988).

5.6.29 During the medieval period, towns and ports along the Suffolk and Essex coasts continued to be a major focus for maritime trade and shipbuilding throughout the medieval and later periods. The growth of these towns and ports indicates the high level of trade and the influence this had on the wider region. In fact, Norfolk and Suffolk established larger fleets than any other region of England at this time (Williams, 1988: 257). The village of Walberswick became a major trading port from the 13th century until the First World War, trading in goods such as fish, cheese, corn, bacon and timber. Similarly, Southwold, meaning Southern wood, started off as a fishing port until receiving its town charter in 1489. This enabled the town to expand into a trading and fishing port.

5.6.30 Within a century the advance in shipbuilding technological capabilities and cheap ordnance meant that conflicts at sea became organised, larger in scale and more destructive. For instance, the marine battles of the Anglo-Dutch wars, including the Battle of Lowestoft (1665) and the Battle of Solebay (1672) (NMHR_1583892).

5.6.31 The post-medieval and modern periods are undoubtedly the most dramatic in terms of development in shipbuilding. It was during this period that metal became prevalent in ship construction, starting as composite vessels where metal replaced some of the wooden parts to vessels built entirely of iron or steel. In parallel to this physical development, was the change from sail to firstly steam power then later diesel engines as new technologies provided the means of propulsion that powered the vessels of the Industrial Revolution. Most of the goods being traded around the UK were associated with the industrial output and included bulk cargos of fuel and raw materials. The East coast was especially prevalent within the coal trade as the towns and cities of the North East supplied London with its coal.

5.6.32 The development of the steam ship brought a new type of maritime traffic to ports. Ships were no longer at the mercy of wind and tide, and new industries and leisure activities were developing. By 1831, about 120,000 passengers travelled annually from London to Margate, and seaside towns became day excursion destinations.

5.6.33 The modern period is also characterised by the two World Wars of the 20th century, which saw a sudden rise in military activity for two relatively short periods. As the region encompassing the study area had trade from London passing through it, it attracted intensive enemy action throughout both wars. This took the form of attacks by submarine, aircraft and most commonly mines.

5.6.34 Both conflicts developed separate strategies with which to disrupt shipping, based around the available technologies of the time, with the East Coast witnessing a large proportion of maritime wartime casualties during both conflicts. For instance, great defensive belts of mines were laid during both World Wars to defend the east coast and coastal shipping and the entrance to the Thames estuary. Additionally, the First World War saw the introduction of coastal convoys, whereby steaming merchant vessels were escorted in groups by warships (Hewitt, 2008: 17). The first convoys began on the east coast, and their use continued into the Second World War to transform the east coastal trade route into an indestructible highway (Hewitt, 2008: 17-23). The East Coast War Channels were also created during both the First and Second World War (Fjordr, 2014). These were carefully defined routes that were swept clear of mines allowing the movement of civilian shipping and local fishing vessels to move around the country to meet the UK's domestic requirements.

Potential for Unrecorded Aviation Archaeology

5.6.35 Within the study area, there is considerable potential for the presence of aircraft crash sites and associated aviation material and debris dating from the early 20th century until more recent times, with a concentration dating to the World Wars, particularly the Second World War, 1939-45 (Wessex Archaeology, 2008a).

5.6.36 Aircraft that crash over the sea tend to break up on impact, spreading wreckage over a wider area. Similarly, where two aircraft collide in mid-air, and both are subsequently lost at sea, the recorded site of the loss can incorporate a larger debris field, stretching hundreds of metres in diameter. However, controlled ditching or sunken aircraft (such as flying boats lost at their moorings) may remain considerably more intact. An aircraft crash site in the marine zone may comprise an articulated or partially articulated aircraft and / or associated debris or infrastructure. Debris can comprise a single artefact through to an entire scatter of material.

5.6.37 Prior to the First World War there was limited commercial civil aviation, however the First World War saw the early development of military aviation and the beginnings of naval aviation. During this period, aircraft were lightweight and made of wood and other light materials. In the inter-war years, there was increasing cross-channel services to various European and worldwide destinations, and metal largely replaced wood in airframe construction.

5.6.38 By the Second World War, aircraft technology had developed considerably. Luftwaffe attacks on the UK early in the war were the predominant reason for flights over the English Channel. By the middle of the war, this emphasis had changed, and the Allies were attacking Continental Europe, principally by bomber fleets based in eastern England and maritime patrols. There was mass production of aircraft, leading to considerable quantities of aircraft, and a significant amount of flying occurred over the sea.

5.6.39 Most aircraft losses at sea are attributed to military aircraft and date from the Second World War, most of which occurred along the south and east coasts of England. The Suffolk's airfields were heavily used during the Allied strategic bombing effort of the later stages of the War, initially by the Royal Air Force (RAF) and later the United States Air Force (USAF).

5.6.40 As the study area is located within a known war time shipping route, from the South of England to London, it is likely that this would have added to the level of aircraft activity in the area, as evidenced by the air raid of 1943 when low-flying German fighter-bombers attacked the town and killed eleven people (Southwold Museum, 2025). The likely intensity of aviation activity highlights the high potential for aircraft remains to be recovered from within the study area, which is also highlighted by analyses of UK-wide records (Wessex Archaeology, 2008a, b).

5.6.41 From the end of the war to the present, civilian air travel has increased. Military aircraft was, until the 1990s, dominated by the Cold War. These aircraft crash events are more likely to have been accurately recorded and positioned, however there is still potential for material.

6 MARINE ARCHAEOLOGICAL ASSESSMENT: INTERTIDAL HERITAGE ASSETS

6.1 Introduction

6.1.1 The following assessment of the intertidal archaeological baseline resource is based on records of known features in the NMHR, Suffolk HER and CITiZan databases, up to MHWS mark. A full assessment of terrestrial historic environment and cultural heritage will be presented separately (**Volume 1, Chapter 11 Historic Environment**).

6.1.2 The records located within the study area are presented in **Appendix 8** and on **Figure 11.** The centre points of polygons have been used to generate the coordinate location in the gazetteer, which may be located outside of the study area, but the extent of the polygons are shown on the figure.

6.2 Protected Sites

6.2.1 There are no designated terrestrial sites within the intertidal zone of the Proposed Offshore Scheme.

6.3 Known Sites and Findspots

6.3.1 There are 15 terrestrial sites located at the proposed Landfall in Walberswick.

6.3.2 There are two records of material dating to the Palaeolithic to the Romano-British period within the study area, consisting of sub-rectangular rafts of well-humidified peat found at high tide mark (**1011**) and a possible Neolithic settlement (**1012**) represented by flint flakes tools, fragments of pottery and bone / antler artefacts.

6.3.3 Six records (**1003**, **1004**, **1006, 1007**, **1009** and **1013**) relate to material dating to the Early Medieval – medieval period, consisting of pottery scatters, pottery kilns and structures. There is one record (**1001**) consisting of a flood sea defence, seen as an earthwork in aerial photographs dating to the post-medieval period.

6.3.4 Three records relate to Second World War coastal defence measures, including anti-tank scaffolding and barbed wire defences (**1002**), a cluster of structures, with possible pillbox (**1005**), and a section of barbed wire obstruction and small structure, possibly a pillbox

(**1008**). These records were seen on aerial photographs dating from 1941 to 1945 and therefore their current condition and extent are unknown. These sites are no longer visible on modern aerial imagery, however, it is possible that material from these features could remain, buried, although, any material is likely to be fragmentary.

6.3.5 The final three records relate to human remains (**1010**), a ring ditch (**1014**) and a possible ancient encampment (**1015**), all of which are of unknown date and have limited details.

6.4 Setting and Value

6.4.1 A majority of the terrestrial findspots and structures in the intertidal zone have been removed and therefore these features do not have setting as they have been removed from their context. If any Second World War material is discovered during works associated with the Proposed Offshore Scheme, these would have to be assessed within the wider setting of military events and coastal defences. However, the value of such material, if discovered, would be of low archaeological value as it will relate to a modern site which were a common occurrence on most coastlines of east Britain during the war. For features where it is unknown whether any material still survives, these features would have setting in line with other buried features.

6.5 Potential for Heritage Assets within the Intertidal Zone

6.5.1 The presence of known archaeological remains from the intertidal and coastal areas suggests the potential for the discovery of further material that was terrestrial but is now submerged due to sea level rise or erosion and also material relating to human use of the intertidal zone including flood defences and coastal defence systems. A gradiometer survey undertaken in 2023 - 2024 has successfully detected anomalies of archaeological origin across arable fields located south of Lodge road, Walberswick, in the form of a large overarching road and multiple examples of settlement activity, possibly ranging from the Saxon period through to the Second World War (Wessex Archaeology, 2024). Any such discoveries would have to be assessed on a case-by-case basis, within the wider landscape framework, but in general, finds from the Neolithic period onwards are likely to provide evidence of the changing coastline over time and of activities in the intertidal zone.

6.5.2 The present sea levels were reached during the medieval period and post-Romano British marine transgression led to the deposition of deep-alluvial layers. As a result, there is potential for now buried material from the Palaeolithic to the Romano-British period. The Suffolk coasts have seen considerable erosion, through high levels of wave action, inclement weather and rising sea levels, and it is possible that terrestrial material could have reached the intertidal zone due to erosion of terrestrial sites. This was recognised in the Suffolk Coastal National Mapping Programme project (Hegarty *et al*., 2005) as exampled by the medieval town of Dunwich being lost to the sea. Therefore, there is potential for derived evidence from the Palaeolithic to the modern period located within the intertidal zone of the landfalls.

6.5.3 In the landscape around the Suffolk landfall, there is evidence of prehistoric and medieval flint scatters and earthworks comprising round barrows and other types of enclosures and field boundaries, and extensive evidence of industry in the form of post-medieval brickworks, quarries and clay extraction pits. There are also records for early forms of sea defences in the form of a relict sea bank.

6.5.4 Although the multiple features on the coast and in the intertidal zone relating to the Second World War were removed by the middle of the 20th century at the proposed Landfall, there is still some potential for remnant material from these features, and fragmentary material

that was associated with them. Features include extensive lines of different types of coastal defences and pillboxes.

7 HISTORIC ENVIRONMENT ABOVE (FURTHER INSHORE FROM) MHWS

7.1 Introduction

7.1.1 The following historical and archaeological background has been compiled using publicly available online resources, combined with the results of Wessex Archaeology's previous investigations in the area. It considers the recorded NMHR and Suffolk HER within the 500 m buffer above (further inshore from) the MHWS mark of the Proposed Offshore Scheme (**Appendix 9; Figure 12**), to ensure a seamless approach with the terrestrial historic environment assessment. The following archaeological background is not exhaustive but discusses known heritage assets relevant to study area.

7.2 Archaeological and Historical Context

Designated Assets

7.2.1 There are four Grade II listed buildings within the 500 m buffer above the MHWS mark. These are primarily listed as residential domiciles and farmhouses originating from the 17th–18th century, including The Bell Hotel (HER_285564/DFS10270), Valley Farmhouse (HER_285565/DFS10271), Bell Cottage (HER_285566/DFS10743) and The Potter's Wheel (HER_285567/DFS11437).

Prehistoric

7.2.2 Although evidence for prehistoric activity is not widespread within the study area, two findspots have been recorded, including a Mesolithic perforated antler mattock (NMHR_392145) and Neolithic implements (NMHR_392143).

Roman

7.2.3 Evidence for Roman activity in the region is relatively limited. However, several individual finds spots and small artefact scatters have been noted within the study area. A Hod Hill type brooch and a Roman bronze coin were recovered through metal detecting within the area (MSF12476 / WLB010), along with a Roman bronze coin (MSF14448 / WLB015). Roman pottery sherds were also discovered through field walking (NMHR_392140) and to the south of the village (MSF1868 / WLB007).

Medieval

7.2.4 An area south of the village of Walberswick has been highlighted by the Suffolk HER as an area of high archaeological potential (MSF47328 / WLB080). It is thought likely that there remains evidence of a settlement from the Saxon – medieval periods (MSF47328 / WLB140), as attested by the gradiometer survey undertaken in 2023 - 2024 represented in the form of a large overarching road and multiple examples of settlement activity (Wessex Archaeology, 2024).

7.2.5 A dense scatter of medieval pottery and an area of flint rubble thought to be the site of the first church were uncovered during a fieldwalking survey (MSF14327 / WLB 012). A series of adjoining cropmarks forming a rectangular or sub-rectangular enclosure with an enclosed area of approximately 60 m by 30 m (MSF12477 / WLB 012) further attests to the location of a former church.

7.2.6 Additional medieval to late-medieval assorted metal objects, including coins, and pottery scatters have been found through fieldwalking (MSF14328 / WLB015), along with a medieval pit, ditch, and posthole (MSF25182 / WLB073). A scatter of medieval and post-medieval pottery was found at Oldtown Marshes (MSF1870 / WLB 009). This is thought to be the area of old town `dock'. Timbers survive and can be seen at low tide.

Post-medieval

7.2.7 Several sections of sea bank are located throughout the study area, visible as earthworks on 1945 aerial photography (MXS19417 / WLB 047, MXS19402 / SWD034, MXS19407 / WLB038, MXS19416 / WLB046). The banks would have been a part of the flood defences in this area and may well date to the post-medieval period, as several similar features in this area do. Other recorded post-medieval records consist of findspots found through metal detecting (MSF12475 / WLB010, MSF14447 / WLB015), a lime kiln (MSF14891 / WLB131) and the site of a post mill believed to have blown down in 1924 (MSF46596 / WLB138). The record of a hulk along Dunwich River (MSF18746 / SWD014) highlights the potential for maritime activity within the area.

Modern

7.2.8 Located on the North Sea coast, the area surrounding Walberswick saw large-scale coastal defences constructed during the Second World War. As such, there is plentiful evidence for Second World War era defensive infrastructure within the study area.

7.2.9 An extensive semi-circular stretch of barbed wire can be seen as a structure on 1941 aerial photographs (MXS19414 / WLB 044). It partially encloses a length of trench, with associated bank and two, or possibly three, pillboxes. The trenches and pillboxes can still be seen on photographs from 1945, while only very faint, fragmentary traces of the location of the barbed wire are visible by that date. Several Second World War slit trenches, each no more than 10 m in length, can be seen from 1940 / 1941 aerial photographs (MXS19428 / WLB 055, MXS19418 / WLB 048, MXS19419 / WLB 049). Again, these are no longer visible on aerial photographs from 1945. An L-shaped section of barbed wire obstruction can be seen as a structure on grassland close to the beach in 1941 and 1945 aerial photographs (MXS19411 / WLB 042).

7.2.10 Further Second World War sites in the study area include several pillboxes (MSF26423 / WLB 083, MXS19409 / WLB040, NMHR_ 1425948, NMHR_1425950, NMHR_1425949, NMHR_ 1443350, NMHR_ 1426944), rows of anti-tank cubes south of Walberswick (NMHR_ 1425896, NMHR_ 1425898, NMHR_ 1425897), and two bomb craters (MXS19420 / WLB 050, MXS19408 / WLB039).

Undated

7.2.11 A perforated antler object, possibly a pick, was found south of Dunwich River, close to the intertidal zone (MSF1869 / WLB 008). A further record consisting of a cistern with bunghole and Moorish coin was found at Walberswick Beach (MSF34072 / WLB108).

8 ASSESSMENT OF HISTORIC SEASCAPE CHARACTER

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

8.1.2 The method assesses and defines areas with HSC types that promote an understanding of historic trends and processes, to inform the sustainable management of change over time. This is achieved by addressing the multi-level character of the sea, by splitting the marine zone into five tiered levels: the coastal area, the sea surface, the water column, the sea floor and the subsea floor. The characterisation is GIS based, enabling key characteristics to be identified.

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

- cultural topography (palaeochannel);
- cultural topography landward (wetland);
- cultural topography marine (coarse sediment plains; sand banks with sand waves);
- fishing (bottom trawling, drift netting, potting);
- maritime safety (buoyage, safety area);
- navigation (wreck hazard, hazardous water, navigation route, navigation activity, shoals and flats);
- recreation (leisure beach, leisure sailing, wildlife watching);
- industry (commercial shipping route);
- energy industry (submarine power cable, renewable energy installation (wind)); and
- telecommunications (submarine telecommunications cable).

8.1.4 The HSC for the study area already includes submarine telecommunications cables and therefore the Proposed Offshore Scheme will not cause additional impact on the HSC of the study area.

8.2 Value

8.2.1 The HSC of the study area is of medium archaeological value, due to the region's important and prolonged maritime history and its continued use today.

8.2.2 The study area is already characterised by a broad category of industry including submarine cables and commercial shipping route. Therefore, the overall character of the area will remain predominantly the same while the Proposed Offshore Scheme is in operation.

9 SUMMARY OF RESULTS AND OVERALL SENSITIVITY

9.1 Introduction

9.1.1 Based on information available to date and the baseline assessments above, the marine archaeological baseline environment for the study area can be considered to comprise known sites, together with the potential for discovering material relating to palaeogeography, maritime archaeology and aviation archaeology.

9.1.2 The nature of the archaeological resource is such that there is a high level of uncertainty concerning the distribution of potential, unknown archaeological remains on the seabed. It is often the case that data concerning the nature and extent of sites is out of date, extremely limited or entirely lacking. As a precautionary measure, unknown potential cultural heritage assets are therefore considered to be of high value.

9.1.3 All archaeological receptors have the potential to be physically damaged, destabilised or destroyed if they are directly or indirectly impacted. Furthermore, all damage to archaeological sites or material is permanent and recovery is limited to stabilisation or reburial to limit further impact. Archaeological receptors have no recoverability if they are affected by a direct or indirect physical impact. As such, all potential receptors should be regarded as having high sensitivity to direct and indirect physical impacts.

9.2 Palaeogeography Assessment

9.2.1 The assessment of the geophysical data within the study area resulted in the identification of a total of 66 features of palaeogeographic interest. These are summarised as follows:

- A total of 27 features, mainly buried palaeochannels, high amplitude reflectors/organic layers, and banks, were assigned a P1 archaeological rating;
- A total of 39 features, mainly cut and fills and areas of acoustic blanking, were assigned a P2 archaeological rating.

9.2.2 Of particular interest within the study area is the palaeochannel associated with the Palaeo-Yare catchment area (**75020**), the identified high amplitude reflectors and fine grained/organic deposits, and the potential coastal bank (**75016**). These, plus other identified channel features, are all preserved terrestrial features that have the potential to contain both *in-situ* and derived archaeological artefacts and preserved palaeoenvironmental material.

9.2.3 Further work is needed to fully understand the identified features and their chronology, particularly bank feature **75016**. It is recommended that, should any further sampling (e.g. coring) be undertaken from within any of the identified features, that the logs be made available for geoarchaeological assessment. Further to this, recommendations for future geoarchaeological assessment outlined below (**Section 9.3**) will also aid in further refining the SBP assessment.

9.3 Geoarchaeological Assessment

9.3.1 The Stage 1 review of geotechnical data of 224 vibrocores located across the study area identified a Quaternary sequence comprising Pleistocene sediments characteristic of the Yarmouth Roads Formation, the Eem Formation, and the Lower and Upper Brown Bank Formations, overlain by units not correlated to any known geological formation, including fluvial sands and gravels and alluvial sands, peat, organic interbedded sands and head. The Quaternary sequence is generally capped by modern seabed sediments.

9.3.2 Based on the results of the Stage 1 review of geotechnical vibrocore logs, recommendations are made for Stage 2 geoarchaeological recording and deposit modelling, as outlined below, taking into account the *North Sea Prehistory Research and Management Framework* (NSPRMF, 2023). The recommendations made in the following sections for Stage 2 geoarchaeological recording will be reported on in the ES.

Yarmouth Roads Formation

9.3.3 The majority of deposits recovered in vibrocores correlated to the Yarmouth Roads Formation generally represent the most distal extent of a fluvial-deltaic system present across the southern North Sea during the Cromerian (>MIS 13), defined by grey shelly sands. However, in the nearshore area off the proposed Landfall in Walberswick, fine sands absent of shell are present and may represent low-energy fluvial sediments equivalent to the archaeologically significant CF-bF deposits at Pakefield and Happisburgh. It is thus recommended that a selection of samples in the nearshore, including VC_006 which comprises reworked peat, are recorded during Stage 2 assessment by a geoarchaeologist to ground-truth the interpretations based on geotechnical logs and core photographs and to assess the potential for palaeoenvironmental assessment.

Eem Formation

9.3.4 The Eem Formation deposits are characterised by dense brown shelly sands. These sediments were deposited in a fully marine environment during the Ipswichian interglacial (MIS 5e) and therefore have low archaeological and geoarchaeological potential. Organic silts and sands are however recorded overlying these marine sands and may represent falling sea levels and the development of a sub-aerial landscape directly following the Ipswichian highstand. A selection of vibrocores containing these upper organic deposits have therefore been recommended for Stage 2 geoarchaeological recording, to visually corroborate the presence of organic material and assess the potential for palaeoenvironmental assessment.

Brown Bank Formation

9.3.5 No geoarchaeological recording was recommended for Unit 5a or 5b of the Brown Bank Formation. However, Unit 5c is interpreted as possible estuarine to intertidal deposits which tentatively correlate to the upper part of the Brown Bank Formation, possibly representing the regression of this shallow lagoon feature. These deposits are typically minerogenic and contain beds of gravels indicative of high-energy fluctuating conditions and are not considered as geoarchaeologically significant. However, few vibrocores on the margin of the Brown Bank, as mapped by BGS, have been identified as comprising frequent thin beds of organics indicative of stable conditions. Therefore, a selection of these vibrocores with organic bedding have been selected for Stage 2 geoarchaeological recording, to ground-truth interpretations and determine the suitability of the organic beds for Stage 3 palaeoenvironmental assessment.

Fluvial sands and gravels/alluvial sands

9.3.6 A series of deposits characterised by orangish brown frequently laminated, well-sorted sands were identified in vibrocores recovered in the nearshore area of the landfall at Walberswick. It is recommended that a selection of vibrocores containing these alluvial sands are recorded by a trained geoarchaeologist to determine the suitability of these deposits for Stage 3 palaeoenvironmental assessment. The fluvial sands and gravels will also be recorded within the selected vibrocores, however are expected to have lower potential for paleoenvironmental assessment.

Peat

9.3.7 Peat (Unit 6b) was recovered in three vibrocores (VC_005, VC_006 and VC_128). The peats in VC_005 and VC_128 were recovered as in situ units, whereas the peat in VC_006 was recovered as disturbed pockets. Peat was assigned a high priority status as it has high potential to preserve material for both palaeoenvironmental assessment and scientific dating. It is recommended that the samples containing peat are recorded by a

geoarchaeologist to determine their suitability for further assessment considering sample condition and quality.

Organic interbedded

9.3.8 Deposits defined as 'organic interbedded' (Unit 6c) were recovered across the nearshore and offshore extent of the study area. Deposits assigned to this unit were largely assigned a medium priority status. However, nearshore deposits characterised by organic-rich and structured (i.e. well-bedded) sediments were assigned a high priority status, with high potential to contain material suitable for palaeoenvironmental assessment and scientific dating. It is therefore recommended that a selection of core samples are geoarchaeologically recorded to determine the suitability of deposits of further assessment.

9.4 Seabed Features

9.4.1 The assessment of the geophysical data within the study area resulted in a total of 289 anomalies identified as being of possible archaeological interest. This was supplemented with records of known shipwrecks, aircraft crash sites and obstructions. These are summarised as follows:

- no anomalies were assigned an A1 archaeological discrimination;
- a total of 26 anomalies were assigned an A2_h archaeological discrimination;
- a total of 260 anomalies were assigned an A2_l archaeological discrimination;
- a total of three (3) historic records were assigned an A3 archaeological discrimination;
- 36 records consisting of wrecks and obstructions;
- potential for the discovery of shipwreck material from the late Mesolithic to the present; and
- potential for the discovery of 20th century aircraft material, particularly from the Second World War.

9.5 Intertidal Heritage Assets

9.5.1 There are a total of 15 records located within the intertidal zone of the study area together with the potential for the discovery of remains dating from the Palaeolithic to the modern periods (especially Second World War related infrastructure) within the wider study area.

9.6 Historic Environment above MHWS

9.6.1 A review of publicly available resources and previous archaeological investigations in the area south of Walberswick highlight the archaeological potential for the discovery of remains dating from the Mesolithic to the modern periods. This includes the high potential for settlement activity dating from Saxon period through to the Second World War.

9.7 Historic Seascape Character

9.7.1 The historic seascape of the study area has a varied character ranging from fishing activities to offshore industry and navigation. Since the area already contains submarine cables, the impact from the Proposed Offshore Scheme is limited.

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APPENDICES

Appendix 1: Terminology

Glossary

The terminology used in this assessment follows definitions contained within Annex 2 of the UK's National Planning Policy Framework (Ministry of Housing, Communities and Local Government 2024, 70-80).

Term	Definition
Archaeological interest	There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.
Conservation (for heritage policy)	The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance.
Designated heritage assets	World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Park and Gardens, Registered Battlefields and Conservation Areas designated under the relevant legislation.
Development Plan	Is defined in section 38 of the Planning and Compulsory Purchase Act 2004, and includes adopted local plans, neighbourhood plans that have been made and 72 published spatial development strategies, together with any regional strategy policies that remain in force. Neighbourhood plans that have been approved at referendum are also part of the development plan, unless the local planning authority decides that the neighbourhood plan should not be made.
Heritage asset	A building monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated heritage assets and assets identified by the local planning authority (including local listing).
Heritage coast	Areas of undeveloped coastline which are managed to conserve their natural beauty and, where appropriate, to improve accessibility for visitors.
Historic environment	All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.
Historic environment record	Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use.
Setting of a heritage asset	The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.
Significance (for heritage policy)	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. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance.

Term	Definition
Strategic environmental assessment	A procedure (set out in the Environmental Assessment of Plans and Programmes Regulations 2004) which requires the formal environmental assessment of certain plans and programmes which are likely to have significant effects on the environment.

Chronology

Where referenced to in the text, the main archaeological periods in Britain are broadly defined by the following date ranges:

Prehistoric		**Historic**	
Palaeolithic	970,000 - 9500 BCE	Romano-British	AD 43 - 410
Lower Palaeolithic	970,000 - 300,000 BCE	Saxon	AD 410 - 1066
Middle Palaeolithic	300,000 - 40,000 BCE	Medieval	AD 1066 - 1500
Upper Palaeolithic	40,000 - 10,000 BCE	Post-medieval	AD 1500 - 1800
Late Upper Palaeolithic	12,000 - 9500 BCE	19th Century	AD 1800 - 1899
Early Post-glacial	9500 - 8500 BCE	Modern	AD 1900 - present day
Mesolithic	8500 - 4000 BCE		
Neolithic	4000 - 2400 BCE		
Bronze Age	2400 - 700 BCE		
Iron Age	700 BCE - AD 43		

The geological and chronostratigraphic periods referred to in the text, including British chronostratigraphy and corresponding Marine Isotope Stages (MIS), are outline as follows:

Epoch	**Sub-Epoch**		**Age (ka)**	**MIS**
Holocene	Holocene		11.7 - present	1
Late Pleistocene	Devensian	Loch Lomond Stadial	11.7 – 12.9	2 – 5d
		Windermere Interstadial	12.9 - 15	
		Dimlington Stadial	15 – 26	
		Upton Warren Interstadial	40 – 43	
		Early Devensian	60 – 110	
	Ipswichian		115 - 130	5e
Middle Pleistocene	Wolstonian	Unnamed cold stage	134 - 374	6
		Avery interglacial		7
		Unnamed cold stage		8
		Purfleet interglacial		9
		Unnamed cold stage		10
	Hoxnian		374 – 424	11
	Anglian		424 – 478	12
	Cromerian Complex		478 - 780	13

Appendix 2: Legislative, Policy and Guidance

Designated Heritage Assets

Designation	Associated Legislation	Overview
World Heritage Sites	-	The United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Committee inscribes World Heritage Sites for their Outstanding Universal Value (OUV) – "cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity". England protects its World Heritage Sites and their settings, including any buffer zones or equivalent, through the statutory designation process and through the planning system. The National Planning Policy Framework sets out detailed policies for the conservation and enhancement of the historic environment, including World Heritage Sites, through both plan-making and decision-taking.
Scheduled Monuments and Areas of Archaeological Importance	Ancient Monuments and Archaeological Areas Act 1979	Under the Ancient Monuments and Archaeological Areas Act 1979, the Secretary of State (DCMS) can schedule any site which appears to be of national importance because of its historic, architectural, traditional, artistic or archaeological interest. The historic town centres of Canterbury, Chester, Exeter, Hereford and York have been designated as Archaeological Areas of Importance under Part II of the Ancient Monuments and Archaeological Areas Act 1979. Additional controls are placed upon works affecting Scheduled Monuments and Areas of Archaeological Importance under the Act. The consent of the DCMS, as advised by Historic England, is required for certain works affecting Scheduled Monuments.
Protected Wreck Sites	Protection of Wrecks Act 1973	The Protection of Wrecks Act 1973 allows the Secretary of State to designate a restricted area around a wreck to prevent uncontrolled interference. These statutorily protected areas are likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance.
Protected Places and Controlled Sites	Protection of Military Remains Act 1986	The Protection of Military Remains Act 1986 provides protection for designated military vessels and for all aircraft that crashed while in military service. The Act provides two types of protection: Protected Places (wrecks designated by name and can be designated even if the location of the site is not known) and Controlled Sites (sites designated by location – covers wrecks within the last 200 years). It is illegal to disturb sites or remove anything from sites. Protected Places can be visited by divers, but the rule is look but don't touch. For Controlled Sites it is illegal to conduct any operations (including diving or excavation) within the Controlled Site unless licensed to do so by the Ministry of Defence.
Listed Buildings	Planning (Listed Buildings and Conservation Areas) Act 1990	In England, under Section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990, the Secretary of State is required to compile lists of buildings of special architectural or historic interest, on advice from English Heritage/ Historic England. Works affecting Listed Buildings are subject to additional planning controls administered by Local Planning Authorities. Historic England is a statutory consultee in certain works affecting Listed Buildings. Under certain circumstances, Listed Building Consent is required for works affecting Listed Buildings.
Conservation Areas	Planning (Listed Buildings and Conservation Areas) Act 1990	A Conservation Area is an area which has been designated because of its special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. In most cases, Conservation Areas are designated by Local Planning Authorities. Section 72 (1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 requires authorities to have regard to the fact that there is a Conservation Area when exercising any of their functions under the Planning Acts and to pay special attention to the desirability of preserving or enhancing the character or appearance of Conservation Areas. Although a locally administered designation, Conservation Areas

Designation	Associated Legislation	Overview
		may nevertheless be of national importance and significant developments within a Conservation Area are referred to Historic England.
Registered Parks and Gardens and Registered Battlefields	National Heritage Act 1983	The Register of Parks and Gardens was established under the National Heritage Act 1983. The Battlefields Register was established in 1995. Both Registers are administered by Historic England. These designations are non-statutory but are, nevertheless, material considerations in the planning process. Historic England and The Garden's Trust (formerly known as The Garden History Society) are statutory consultees in works affecting Registered Parks and Gardens

Other Relevant Legislation and Policy

Legislation / Policy	Overview
Merchant Shipping Act 1995	This Act sets out the procedures for determining the ownership of underwater finds that turn out to be 'wreck', defined as any flotsam, jetsam, derelict and lagan found in or on the shores of the sea or any tidal water. It includes ship, aircraft, hovercraft, parts of these, their cargo or equipment. If any such finds are brought ashore, the salvor is required to give notice to the Receiver of Wreck. This Act is administered by the Maritime and Coastguard Agency.
Marine and Coastal Access Act 2009	Marine licensing and marine planning made the responsibility of the Marine Management Organisation (MMO). England's inshore and offshore waters have been divided into 11 plan areas, for which marine plans are being produced by the MMO.
UNESCO Convention on the Protection of the Underwater Cultural Heritage	The UNESCO Convention was concluded in 2001 and is a comprehensive attempt to codify the law internationally, with regards to underwater cultural heritage. The UK (including the Bailiwick of Guernsey) abstained in the vote on the final draft of the Convention, however it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the Convention entered into force on 2nd January 2009, having been signed or ratified by 20 member states. To date, the Convention has been ratified by 71 countries.

National Planning Policy Framework

NPPF Section 16: Conserving and enhancing the historic environment	
Para. 207	In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.
Para. 208	Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.
Para. 212 and 213	When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of: a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional; b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional. Non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.
Para. 216	The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.
Para. 219	Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

Appendix 3: Palaeogeographic features of archaeological potential

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75000	Channel	P1	0.1	4.4	A distinct channel feature cut into the underlying crag deposits and overlain by fine grained deposit **75008** at its eastern end. Characterised by a generally well defined, irregular, erosive basal reflector and a single phase of fill that is either acoustically transparent or characterised by parallel internal reflectors. Possible buried fluvial channel.	Unit 6a
75001	Acoustic blanking	P2	1.1	1.9	An area of acoustic blanking within channel **75000**, likely due to shallow gas. Not of archaeological potential in itself, but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6a
75002	Acoustic blanking	P2	1.7	2.1	An area of acoustic blanking within channel **75000**, likely due to shallow gas. Not of archaeological potential in itself, but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6a
75003	Acoustic blanking	P2	2	2.8	An area of acoustic blanking within channel **75000**, likely due to shallow gas. Not of archaeological potential in itself, but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6a
75004	Acoustic blanking	P2	2.4	2.8	Area of acoustic blanking within channel **75000**, likely due to shallow gas. Not of archaeological potential in itself, but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6a
75005	Acoustic blanking	P2	1.2	2.1	Area of acoustic blanking within channel **75000**, likely due to shallow gas. Not of archaeological potential in itself, but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6a
75006	Channel	P1	0.2	7.6	A distinct channel feature cut into the underlying crag deposits and overlain by fine grained deposit **75008**. Characterised by a generally well defined, irregular, erosive basal reflector and a single phase of fill that is either acoustically transparent or characterised by parallel internal reflectors, Possible buried fluvial channel.	Unit 6a

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75007	Simple cut and fill	P2	0.4	2.8	A small but distinct cut and fill feature cut into the underlying crag deposits and overlain by fine grained deposit **75008**. Characterised by a poorly defined basal reflector but a well-defined fill of parallel internal reflectors. Possible remnant of a fluvial feature but only identified on one survey line.	Unit 6a
75008	Fine grained deposit	P1	0.2	3.7	An extensive deposit characterised by parallel internal reflectors, probably on top of the underlying crag formations, and containing an area of acoustic blanking (**75009**). Found by vibrocores to comprise interbedded soft clays, silts, and sands with organic material, potentially indicating estuarine/intertidal deposits (VC_177, VC_202). VC_202 contains a peat layer, suggesting the base of deposit is peaty in places.	Unit 6b / Unit 6c
75009	Acoustic blanking	P2	0.9	2	Area of acoustic blanking within fine grained deposit **75008**, likely due to shallow gas. Not of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6c
75010	Fine grained deposit	P1	0.2	6.5	An extensive deposit characterised by parallel internal reflectors, probably on top of the underlying crag formations, and containing numerous areas of acoustic blanking. Found by vibrocores to comprise interbedded soft clays, silts, and sands with organic material, potentially indicating estuarine/intertidal deposits (VC_179, VC_180, VC_181). VC_005 also contains a peat layer, suggesting the base of deposit is peaty in places.	Unit 6b / Unit 6c
75011	Acoustic blanking	P2	1.1	1.6	Area of acoustic blanking within fine grained deposit **75010**, likely due to shallow gas. Not of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6c
75012	Acoustic blanking	P2	1.8	1.9	Area of acoustic blanking within fine grained deposit **75010**, likely due to shallow gas. Not of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6c
75013	Acoustic blanking	P2	1.8	2.4	Area of acoustic blanking within fine grained deposit **75010**, likely due to shallow gas. Not of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6c

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75014	Acoustic blanking	P2	0.9	1.7	Area of acoustic blanking within fine grained deposit **75010**, likely due to shallow gas. Not of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 6c
75015	Organic layer	P1	0.5	4.2	A distinct reflector potentially marking the top of the underlying crag formation and the base of an early Holocene feature. Overlain by fine grained deposit **75010** to the south-west and likely continues to form the base of the feature. Found by vibrocoring to comprise soft clay and peat, so likely to represent a buried land surface (VC_005, VC_006).	Unit 6b
75016	Bank	P1	0.1	2.7	A potential bank feature identified overlaying organic layer reflector **75015**. The feature is characterised by dipping reflectors, with the direction of dip being towards the coastline, suggesting progradation towards the coast rather than away from it. Potentially a buried barrier sand dune as seen in similar areas along the coast (e.g. Sudbourne Beach at Orford Ness), but this is unclear, and further work would need to be undertaken to ascertain its nature.	Unit 7
75017	Bank	P1	0.4	3.2	A distinct deposit comprising parallel internal reflectors located on top of the possible underlying crag formation and below the seabed sediment. Potentially a remnant fluvial bank feature and/or overbank deposits.	Unit 7
75018	Simple cut and fill	P2	1.4	6.1	Possible poorly defined cut and fill feature characterised by a poorly defined basal reflector and a single phase of acoustically transparent fill. Potential fluvial feature associated with bank deposit **75018** but only identified on a limited number of survey lines.	Unit 6a
75019	Bank	P2	0.4	1.4	A small possible bank feature characterised by dipping internal reflectors. The feature is located directly above a distinct reflector, potentially the top layer of one of the Crag formations, but this is unclear. The feature is overlain by modern seabed sediment and possibly indicates a sand dune feature created during marine transgression. Only identified on one survey line.	Unit 7

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75020	Channel	P1	0.2	5.9	A distinct channel feature potentially cut into both the Yarmouth Roads Formation and the Westkapelle Ground Formation. Characterised by a relatively well-defined, erosive basal reflector and a single phase of acoustically layered fill. Likely a fluvial channel and is part of an interpreted Early Holocene channel identified during regional work associated with the Palaeo-Yare catchment and Aggregate Area 240 archaeological finds approximately 15 - 20 km to the north.	Unit 6a
75021	Channel	P1	0.4	8.4	A distinct channel feature cut into the underlying Yarmouth Roads Formation. Characterised by a generally well-defined, irregular, erosive basal reflector, and a single phase of fill comprising parallel internal reflectors. Possible channel, potentially a Brown Bank Formation channel feature, but this is uncertain. Located to the west of similar feature **75022**.	Unit 5 / Unit 6a
75022	Channel	P1	0.3	12.1	A distinct channel feature cut into the underlying Yarmouth Roads Formation. Characterised by a generally well-defined, irregular, erosive basal reflector, and a single phase of fill comprising parallel internal reflectors. Possible channel, potentially a Brown Bank Formation channel feature, but this is uncertain. Located to the east of similar feature **75021**.	Unit 5 / Unit 6a
75023	Channel	P1	1.1	7.5	A broad, distinct channel feature cut into the underlying Yarmouth Roads Formation. Characterised by a well-defined, irregular, erosive basal reflector, and a single phase of fill comprising parallel internal reflectors. The fill ha sbene found by virbocoring to comprise soft to stiff silty clay (VC_028). Possible channel, potentially a Brown Bank Formation channel feature.	Unit 5 / Unit 6a
75024	Simple cut and fill	P2	1.4	3.7	A relatively small, possible cut and fill feature cut into the underlying Yarmouth Roads Formation and overlain by mobile seabed sediments. Characterised by a poorly defined basal reflector and weak parallel internal reflectors. Possible remnant of a fluvial channel but could be an internal Yarmouth Roads feature.	Unit 3 / Unit 5 / Unit 6a
75025	Bank	P2	0.8	1.9	Small possible bank feature characterised by dipping internal reflectors. The feature is located directly above a distinct reflector found by viborocoring to represent a soft clay layer (VC_031, VC_030a), potentially the top layer of the Westkapelle Ground Formation, but this is uncelar. The feature is overlain by modern seabed sediment, and possiby indicates a sand dune feature created during marine transgression. Only identified on one survey line but located adjacent to similar feature **75026**.	Unit 7

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75026	Bank	P2	2.2	3.4	Small possible bank feature characterised by dipping internal reflectors. The feature is located directly above a distinct reflector found by viborocoring to represent a soft clay layer (VC_031, VC_030a), potentially the top layer of the Westkapelle Ground Formation, but this is uncelar. The feature is overlain by modern seabed sediment, and possiby indicates a sand dune feature created during marine transgression. Only identified on one survey line but located adjacent to similar feature **75025**.	Unit 7
75027	Channel	P1	0.3	11.2	A distinct channel feature cut into the underlying Yarmouth Roads Formation and overlain by mobile seabed sediment. Characterised by a well-defined, erosive basal reflector and two phases of fill - a thin, lower, acoustically transparent fill, and an upper fill characterised by parallel internal reflectors which makes up the majority of the feature. The fill has been found by vibrocoring to comprise soft silty clay and silty sand (VC_033, VC_034). Possible channel feature, potentially a Brown Bank Formation channel.	Unit 5
75028	Bank	P2	0.1	9.3	A bank of acoustically layered sediment overlying a well-defined basal reflector and overlain by mobile seabed sediment. Found by vibrocoring to comprise soft to firm sandy silty clay (VC_039). Possible bank feature comprising Brown Bank Formation deposits.	Unit 5
75029	Channel	P1	0.2	5.9	A distinct channel feature cut into the underlying Yarmouth Roads Formation and overlain by a thin layer of mobile seabed sand. Characterised by a well-defined, often irregular, basal reflector and a single phase of fill characterised by parallel internal reflectors. Possible channel feature, potentially a Brown Bank Formation channel.	Unit 5 / Unit 6a
75030	Channel	P1	1.3	16.1	A distinct channel feature cut into the underlying Yarmouth Roads Formation and is overlain by a distinct sand wave that partially obscures the feature. Characterised by a poorly defined basal reflector and a single phase of weakly acoustically layered fill. Possible buried palaeochannel, possibly a Brown Bank Formation channel, but this is uncertain.	Unit 5 / Unit 6a

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75031	Simple cut and fill	P2	0.4	6.3	A relatively poorly defined possible cut and fill feature cut into the underlying Yarmouth Roads Formation, overlain by significant sand waves which partially obscure the feature. Characterised by a relatively distict basal reflector, and a single phase of fill that is either acoustically unstructured or comprising parallel internal reflectors, depending on the survey line. The fill has been found by vibrocoring to comprise firm silty clay and fine to medium sand (VC_058). Possible channel, but potentially the edge of a blanket deposit of Brown Bank Formation.	Unit 5
75032	Simple cut and fill	P2	1.1	7.8	A relatively poorly defined possible cut and fill feature cut into the underlying Yarmouth Roads Formation, overlain by significant sand waves which partially obscure the feature. Characterised by a relatively distinct basal reflector, and a single phase of fill comprising parallel internal reflectors. The fill has been found by vibrocoring to comprise firm silty clay with silt bands (VC_059 and VC_060). Possible channel, but potentially the egde of a blanket deposit of Brown Bank Formation.	Unit 5
75033	Channel	P1	0.2	8.7	A distinct channel feature cut into the underlying Yarmouth Roads Formation. Characterised by a distinct, irregular, erosive basal reflector and a fill comprising multiple internal reflectors parallel to the basal reflector. Potentially two phases of similar fill, but this is unclear. The fill has been found by vibrocoring to comprise soft to firm clay and clayey silt (VC_068 and VC_069). Possible channel feature, potentially a Brown Bank Formation channel.	Unit 5
75034	Simple cut and fill	P2	0.4	4.4	A small possible cut and fill feature identified beneath a unit of modern marine sand, cutting into the top of the underlying Yarmouth Roads Formation. The feature has a weak basal reflector, and a single phase of fill characterised by parallel internal reflectors. Possible relict fluvial feature but may be an internal feature within the Yarmouth Roads.	Unit 3 / Unit 5 / Unit 6a
75035	Simple cut and fill	P2	0.5	2.7	A simple cut and fill identified beneath a unit of modern marine sediments, cutting into the underlying Yarmouth Roads Formation. The feature has a well-defined basal reflector and a single phase of fill characterised by sub-horizontal reflectors, possibly indicating well-layered fill. Possible channel, but potentially the edge of a blanket deposit of Brown Bank Formation.	Unit 5

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75036	Complex cut and fill	P2	0.6	5.2	A cut and fill feature identified beneath a unit of modern marine sediments, cutting into the underlying Yarmouth Roads Formation. The feature has a well-defined basal reflector and two phases of fill - a lower acoustically chaotic/unstructured fill, and an upper fill characterised by sub-horizontal reflectors, possibly indicating well-layered sediment. The fill, potentially the lower fill, has been found by vibrocoring to comprise silty fine sand with occasional organic material (VC_072). Possible channel, but potentially the edge of a blanket deposit of Brown Bank Formation.	Unit 5
75037	Simple cut and fill	P2	2.1	3.1	A small cut and fill feature identified beneath the Brown Bank Formation. The feature has a well-defined basal reflector with a single phase of acoustically transparent/unstructured infill. Possible remnant of a fluvial feature but may just be a lower unit of the Brown Bank Formation.	Unit 5
75038	Simple cut and fill	P2	4.2	8.2	A small cut and fill feature identified beneath the Brown Bank Formation. The feature has a well-defined basal reflector with a single phase of acoustically transparent/unstructured infill. Possible remnant of a fluvial feature but may just be a lower unit of the Brown Bank Formation.	Unit 5
75039	Channel	P1	2.3	15.3	A large channel identified beneath a relatively thick unit of modern marine sand, cutting into the underlying Yarmouth Roads Formation. The feature has a well-defined basal reflector and fill characterised by sub-horizontal reflectors, possibly indicating well-layered fill. The fill has been found by vibrocores to comprise soft clayey silt and silty clay (VC_079, VC_080). Possible channel feature, potentially filled with Brown Bank Formation sediments.	Unit 5
75040	Simple cut and fill	P2	5.5	8.2	A small cut and fill identified beneath a unit of modern marine sand, cutting into the top of the Yarmouth Roads Formation. The feature has an indistinct basal reflector with an acoustically chaotic infill. Possible remnants of a fluvial feature but may be an internal Yarmouth Roads feature.	Unit 3 / Unit 6a
75041	Simple cut and fill	P2	2.5	6.1	A distinct cut and fill feature identified at the base of the Brown Bank Formation. The feature has a well-defined basal reflector with a single phase of acoustically transparent/unstructured infill. The fill has been found by vibrocore to comprise clayey silty fine sand (VC_084). Possible remnant of a fluvial feature, but may just be a lower unit of the Brown Bank Formation.	Unit 5a

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75042	Acoustic blanking	P2	0.7	0.9	A small area of acoustic blanking within the Brown Bank Formation and could either be the result of shallow gas or internal sediment disturbance. Only identified on one survey line. If caused by shallow gas, this is not considered of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 5
75043	Simple cut and fill	P2	0.9	2	A simple cut and fill identified cutting into the top of the Brown Bank Formation and overlain by a thin deposit of mobile seabed sediment. The feature has a well-defined basal reflector and a single phase of acoustically quiet infill. Possible remnants of a fluvial feature but has only been identified on a single survey line.	Unit 6a
75044	Simple cut and fill	P2	0.5	1.7	A simple cut and fill identified cutting into the top of the Brown Bank Formation and overlain by a thin layer of mobile seabed sediment. The feature has a well-defined basal reflector and a single phase of acoustically quiet infill. Possible remnants of a fluvial feature but has only been identified on a single survey line.	Unit 6a
75045	Simple cut and fill	P2	2.9	3.5	A simple cut and fill identified cutting into the top of the Brown Bank Formation, overlain by modern mobile seabed sediment. The feature has a poorly defined basal reflector, and a single phase of fill characterised by parallel internal reflectors. Possible remnants of a fluvial feature but has only been identified on a single survey line.	Unit 6a
75046	Acoustic blanking	P2	1.5	2.2	A small area of acoustic blanking within the Brown Bank Formation and could either be the result of shallow gas or internal sediment disturbance. Only identified on one survey line. If caused by shallow gas, this is not considered of archaeological potential in itself but indicates the presence of organic matter within the sediment which could be of archaeological and/or palaeoenvironmental interest.	Unit 5
75047	High amplitude reflector	P1	2.2	3.7	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, located beneath modern seabed sediments. Possible horizon containing preserved organic material such as organic clay or peat.	Unit 6b

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75048	High amplitude reflector	P2	0.6	4.6	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation and beneath a unit of modern marine sands and sand waves. Only identified on one survey line. Possible horizon containing preserved organic material such as organic clay or peat.	Unit 6b
75049	Simple cut and fill	P2	2.3	3.7	A simple cut and fill identified cutting into the underlying Brown Bank Formation and located beneath modern seabed sand. The feature has a poorly defined basal reflector and a single phase of acoustically quiet infill. The feature has been tentatively found by vibrocoring to comprise silty fine to coarse sand (VC_097) and may be the remnants of a fluvial feature or be an internal Brown Bank feature.	Unit 5 / Unit 6a
75050	High amplitude reflector	P1	1.1	3	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands and sand waves. Possible horizon containing preserved organic material such as organic clay or peat.	Unit 6b
75051	High amplitude reflector	P1	0.3	1.9	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands and sand waves. Possible horizon containing preserved organic material such as organic clay or peat. No peat was recovered from vibrocore VC_104, but any organic layer may potentially be discontinuous.	Unit 6b
75052	High amplitude reflector	P2	1.5	1.9	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation and beneath a unit of modern marine sands and sand waves. Only identified on one survey line. Possible horizon containing preserved organic material such as organic clay or peat.	Unit 6b
75053	Fine grained deposit	P2	1.9	3.7	A possible cut and fill identified at the top of the Brown Bank Formation and beneath a unit of modern marine sands. The feature has a poorly defined basal reflector, and a single phase of fill characterised by poorly defined internal reflectors. Vibrocore VC_106 suggests the fill comprises silty fine sand. Could be an internal layer within the blanket Brown Bank Formation or be a later terrestrial/intertidal feature.	Unit 5 / Unit 6a
75054	High amplitude reflector	P1	0.2	1.6	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands. Possible horizon containing preserved organic material such as organic clay or peat.	Unit 6b

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75055	Channel	P1	1.2	5.1	A large channel identified beneath a unit of modern marine sand, cutting into the top of the Brown Bank Formation. The feature has a well to poorly defined basal reflector and two distinct phases of fill - a lower fill characterised by sub-horizontal parallel reflectors, possibly indicating well-layered sediment, and an upper acoustically chaotic fill. Possible buried fluvial feature.	Unit 6a
75056	Simple cut and fill	P2	1.9	4.1	A small, poorly defined cut and fill feature identified beneath a unit of modern marine sand, cutting into the top of Brown Bank formation. The feature has a weak basal reflector, and a single phase of fill characterised by parallel internal reflectors. Possible remnant channel feature but could be an internal feature within the Brown Bank Formation.	Unit 6a
75057	High amplitude reflector	P1	1.5	2.2	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands. Found by vibrocore VC_111 to be a layer of clayey peat.	Unit 6b
75058	High amplitude reflector	P1	0.8	1.8	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands and overlying channel feature **75059**. Possible horizon containing preserved organic material such as organic clay or peat. No peat was recovered from vibrocore VC_127, but any organic layer may potentially be discontinuous.	Unit 6b
75059	Channel	P1	1.3	3.8	A relatively poorly defined channel feature identified at the top of the Brown Bank Formation and beneath an area of high amplitude reflectors (**75058**). The feature has a poorly defined basal reflector with fill characterised by parallel internal reflectors, possibly indicating a well-layered fill. Possible buried fluvial channel.	Unit 6a
75060	High amplitude reflector	P1	0.9	1.4	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands. Possible horizon containing preserved organic material such as organic clay or peat.	Unit 6b
75061	High amplitude reflector	P1	1.1	1.6	A distinct, flat, high amplitude reflector identified at the top of the Brown Bank Formation, beneath a unit of modern marine sands. Found by vibrocore VC_128 to be a layer of woody and fibrous peat.	Unit 6b

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit
			From	To		
75062	Simple cut and fill	P2	0.7	1.6	A possible simple cut and fill identified beneath a unit of modern marine sand and cutting into the top of the Brown Bank Formation. The feature has a poorly defined basal reflector with fill characterised by sub-horizontal internal reflectors, possibly indicating a well-layered fill. Only one edge of the feature is sometimes visible, suggesting this may be a lateral change in sediment type in the upper layers of sediment, but it could also be the remnants of a buried fluvial feature.	Unit 6a
75063	Erosion surface	P1	0.4	1.2	A possible erosion surface visible as a well-defined reflector overlying a lens of angled reflectors within the seabed sediment. Potentially buried sand dunes or banks.	Unit 7
75064	Bank	P2	1.4	2.8	A poorly defined lens of angled reflectors within the seabed sediment. Potentially a bank within the seabed sediment but could be an internal feature.	Unit 7
75065	High amplitude reflector	P2	5.6	6.5	An area of intermittent high amplitude reflectors along a single level in the stratigraphy, located within the Eem Formation. Potentially not of high archaeological interest, but could be an organic rich layer that could be of palaeoenvironmental potential.	Unit 4

Appendix 4: Charted Maritime Records

WA ID	Wreck Category	Name	Position (ETRS89 UTM31N)		Description	External Reference (UKHO)
			Easting	Northing		
2001	Foul ground	N/A	409582.7	5796736	Foul ground. Pecked line extending across drying bank, 20 m from foot of breakwater. Record amended to dead.	10727
2002	Obstruction	N/A	409626.1	5796755	Obstruction. Struck by boat halfway between the eastern end of the north pier and the 'Knuckle' 5 m off the north wall. Suspected to be a large rock used in the defence of the knuckle that has been washed downstream.	68446
2003	Foul ground	N/A	411720.7	5797194	Foul ground, located at a general depth of 14 m. Boulder size contact or net fastener. Not located in multibeam survey dataset 2017. Record amended to dead.	10735
2004	Wreck	*Nautilus*	412387.5	5796348	UKHO record of a dangerous wreck located at a general depth of 15 m. Identified as *Nautilus*, British wooden fishing vessel which sank on 1 December 1991 after striking a wooden timber which sprang her wooden hull and sank. Not located by multibeam survey in 2016. Record amended to dead.	10807
2005	Wreck	Unknown	412896.5	5796215	UKHO record of a dangerous wreck located at a general depth of 13 m. 1983 stated to be a wreck. Not located by survey in 1985, position is close to an area of clay boulders. Not located by multibeam survey dataset 2017. Record amended to dead.	10705
2006	Fishermen's fastener	N/A	414528	5799648	Foul ground, located at a general depth of 16 m. Fisherman's fastener. Not found in multibeam survey dataset 2017. Record amended to dead.	10704
2009	Wreck	*Bygdo*	418376.7	5803476	UKHO record of a non-dangerous wreck, located at a general depth of 20 m. Identified as *Bygdo*, Norwegian steamship of 2345 gross tonnage, which sank on 27 October 1916 with a cargo of coal. See 10375. Steamship was built in 1887 by E Whity & Co. At the time of loss, it was owned by Ronald Akties. It had a triple expansion engine of 210 hp. Sunk by mine. During search carried out in 1918 it was not found. Not located by multibeam survey in 2017. Record amended to dead.	10376
2010	Foul ground	N/A	418808.5	5803284	Foul ground, located at a general depth of 20 m. Cables, chains, moorings, nets, tackle, wires. Located in 1982 as pipeline or disused buried cable, but visible on	10669

WA ID	Wreck Category	Name	Position (ETRS89 UTM31N)		Description	External Reference (UKHO)
			Easting	Northing		
					hydrosearch. Not located in multibeam survey dataset 2017. Record amended to dead.	
2011	Wreck	*Rhineland*	420130.6	5804086	UKHO record of a dangerous wreck located at a general depth of 24 m. Identified as *Rhineland*, British steamship of 1501 gross tonnage, that sank on 11 November 1915. The steamship was mined 6 miles southeast of Southwold whilst en route from Middlesbrough to Nantes with a cargo of steel. Salvage operations took place in 1954 and completed. Area last examined in 2017, wreck is broken in two parts and partially buried.	10379
2012	Wreck	*Tidal*	421038.4	5804360	UKHO record of a dangerous wreck located at a general depth of 21 m. Identified as *Tidal*, British steel sailing vessel, which sank on 12 January 1922 carrying a cargo of coal en route from Seaham to Weymouth when it foundered. Survey work was undertaken in 1922. Not located in multibeam survey dataset 2017. Record amended to dead.	10383
2013	Wreck	Unknown	422945.4	5804575	UKHO record of a dangerous wreck located at a general depth of 28 m. Unknown identification of a trawler with bows facing east-south-east and aft substructure. Located during pipe towing survey using magnetometer. Area last examined in 2017, wreck is broken in two parts and partially buried.	10385
2014	Wreck	Unknown	422978.4	5804515	UKHO record of a dangerous wreck located at a general depth of 26 m. See 10385. Not located in multibeam survey dataset 2017. Record amended to dead.	10659
2015	Wreck	*Burtonia* (possibly)	426166.4	5804053	UKHO record of a dangerous wreck located at a general depth of 30 m. Identified as *Burtonia* (possibly), British motor vessel (cargo coaster) of 498 gross tonnage, which sank on 30 November 1972. Ex-Jacoba M. was built of steel in 1960. At the time of loss it was owned by Trent Lighterage Co. It had an oil engine of 450 hp, single shaft. It was on passage from Gunness to Ghent with a cargo of lead concentrate when it thought to have sunk when bulk cargo shifted in heavy weather, approximately 7.5 miles East of Coverhithe Tower. Area last examined in 2017, wreck is largely intact and partially buried in a sand wave.	10380
2016	Wreck	*Claudia*	426324.4	5803815	UKHO record of a dangerous wreck located at a general depth of 25 m. Identified as *Claudia*, British steamship of 1144 gross tonnage, which sank on 30 July 1916. The steamship was built in 1897 by Richardson, Duck & Co, Stockton-on-Tees. At the time of loss, it was owned by the Tyne-Tees Shipping Co. Ltd. It had two	10378

WA ID	Wreck Category	Name	Position (ETRS89 UTM31N)		Description	External Reference (UKHO)
			Easting	Northing		
					boilers, a triple expansion engine of 300 hp, single shaft and the machinery was provided by Sir C. Furness, Westgarth Co. Ltd. Middlesborough. Not located in multibeam survey dataset 2017. Recorded amended to dead.	
2017	Wreck	*Ren*	427372.7	5802449	UKHO record of a dangerous wreck located at a general depth of 30 m. Identified as *Ren*, a steamship that was built in 1903. First examined in 1942 and swept clear, shown to be lying upright. Area last examined in 2017, wreck is upright with the stern section degraded and partially buried.	10371
2018	Wreck	*Maria Rosa*	427694.5	5802801	UKHO record of a dangerous wreck located at a general depth of 30 m. Identified as *Maria Rosa*, Italian steamship of 4211 gross tonnage, which sank on 29 February 1940 in ballast. The steamship was on passage from Marseille to Hartlepool when it was torpedoed by U20. Twelve men were lost. When examined in 1942, the steamship was lying upright. Area last examined in 2017, wreck is broken and partially buried.	10374
2019	Wreck	Unknown	428413.4	5804433	UKHO record of a non-dangerous wreck, located at a general depth of 30 m. Sonar contact. Not located in multibeam survey dataset 2017. Record amended to dead.	10384
2020	Wreck	Unknown	431134.1	5802536	UKHO record of a dangerous wreck located at a general depth of 36 m. Area last examined in 2017, wreck is degraded and partially buried.	10372
2021	Obstruction	N/A	431224.3	5802632	Non-sub contact fixed in 1961. See 10372. Not located in multibeam survey dataset 2017. Record amended to dead.	68084
2023	Obstruction	N/A	431890	5802901	Small area of reflective bottom located in 1995. Not located in multibeam survey dataset 2017. Record amended to dead.	10994
2024	Wreck	Unknown	436407.2	5804743	UKHO record of a non-dangerous wreck, located at a general depth of 34 m. Last examined in 2021, remains of a partially buried wreck.	96371
2025	Wreck	Unknown	441272.2	5807353	UKHO record of a non-dangerous wreck, located at a general depth of 45 m. Area last examined in 2021, wreck is upright and mainly intact with southern section buried.	10996
2026	Fishermen's fastener	N/A	452099.2	5813910	Foul ground, located at a general depth 38 m, Fishermen's Fastener. Not located in multibeam survey dataset 2017. Record amended to dead.	11162

WA ID	Wreck Category	Name	Position (ETRS89 UTM31N)		Description	External Reference (UKHO)
			Easting	Northing		
2027	Wreck	Unknown	454191.7	5816390	UKHO record of a non-dangerous wreck, located at a general depth of 47 m. Intact and upright, in an area of 10 m of sand waves.	11251
2028	Wreck	*Boy Jack*	466180.6	5834381	UKHO record of a non-dangerous wreck, located at a general depth of 47 m. Identified as *Boy Jack*, British wooden trawler of 57 gross tonnage, which sank on 26 July 1918 after being captured and sunk by German submarine using explosives. Three men were lost. Sunk in same position as 69844 and 69850. Not found in 1988. Record amended to dead.	69847
2029	Wreck	*Godesgenade*	466180.6	5834381	UKHO record of a non-dangerous wreck, located at a general depth of 47 m. Identified as *Godesgenade*, Belgian fishing vessel of 34 gross tonnage, which sank on 26 July 1918 after being captured and sunk using demolition charges by a German submarine. Sunk in same position as 69847 and 69850. Not found in 1988. Record amended to dead.	69844
2030	Wreck	*Lord Carnarvon*	466180.7	5834388	UKHO record of a non-dangerous wreck, located at a general depth of 47 m. Identified as *Lord Carnarvon*, British trawler of 80 gross tonnage, which sunk on 20 November 1914 by a German mine laying submarine. Ten men were lost including the skipper. Sunk in same position as 69844 and 69847. Not found in 1988. Record amended to dead.	69850
2031	Wreck	Unknown	468710.2	5839050	UKHO record of a non-dangerous wreck, located at a general depth of 43 m. Identified as Wast (possibly). Mainly buried, possibly in sand mound. Area last examined in 1988, wreck largely buried with only about 2 m protruding above seabed. Much of the wreck could be buried in the large amount of sand which has accumulated to the north of the wreck.	11094
2032	Wreck	*Drakes Drum*	471810.8	5855715	UKHO record of a non-dangerous wreck, located at a general depth of 32 m. Identified as *Drakes Drum*, British fishing vessel (cabin cruiser) which sank on 28 November 1971. Last surveyed in 1982 and nothing was found at wrecked position. Record amended to dead.	11122
2033	Wellhead	N/A	472725.4	5863094	Foul ground, located at a general depth of 38 m. Wellhead. Described as small foul, possible wellhead, examined in 1999. Last examined in 2014, not located by multibeam survey. Moderate magnetic anomaly suggests buried object.	69759
2034	Obstruction	N/A	472905.3	5861575	Obstruction	89364

WA ID	Wreck Category	Name	Position (ETRS89 UTM31N)		Description	External Reference (UKHO)
			Easting	Northing		
2035	Aircraft	Unknown	472963.9	5861270	UKHO record of a non-dangerous wreck, located at a general depth of 38 m. Unknown identification of an aircraft that crashed and was salvaged in 1983. Not located in 1988 survey. Record amended to dead.	69822
2036	Wreck	Unknown	473049.9	5876718	UKHO record of a non-dangerous wreck, located at a general depth of 33 m. Sank on 3 September 1915. Not found during intensive search in 1973. Record amended to dead.	9541
2037	Fishermen's fastener	N/A	473602.7	5875634	Foul ground, located at a general depth of 32 m. Fishermen's fastener. Nothing found during area search in 1989. Record amended to dead.	67294
2038	Wreck	*Jacoba Alijda*	479963.1	5879422	UKHO record of a dangerous wreck located at a general depth of 34 m. Identified as the *Jacoba Alijda*, a Dutch trawler of 429 gross tonnage that sank on 8 September 2005. The Jacoba Alijda was built in 1987. Her wrecking was due to a collision with M Product Tanker Shinouss. Last examined in 2021.	66518
2039	Wreckage	Unknown	485776.2	5889710	Foul ground, located at a general depth of 29 m. Identified as an area of wreckage with small magnetic signature suggesting low ferrous content. Amended to foul.	9636

Appendix 5: Seabed anomalies of archaeological potential

ID	Classification	Position (ETRS89 UTM31N)		Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Interpretation	Anomaly type	Dataset	Section	External references
		Easting	Northing										
70000	Dark reflector	408917	5796284	A2_l	2.6	0.7	0.1	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_INT	Intertidal	-
70001	Dark reflector	409103	5796447	A2_l	0.8	0.4	0.1	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_INT	Intertidal	-
70002	Dark reflector	408801	5796126	A2_l	0.7	0.2	-	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_INT	Intertidal	-
70003	Debris	408972	5796277	A2_h	3.9	0.4	0.6	-	Interpreted as possible debris.	Raw SSS	Raw_SSS_B04_INT, Raw_SSS_B04_NSH	Intertidal, Nearshore	-
70004	Dark reflector	409063	5796370	A2_l	1.6	0.4	0.4	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_INT	Intertidal	-
70005	Dark reflector	409109	5796388	A2_l	1.1	0.5	0.1	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70006	Magnetic	409170	5796457	A2_l	-	-	-	23	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70007	Magnetic	409235	5796403	A2_l	-	-	-	24	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70008	Magnetic	409090	5796201	A2_h	-	-	-	316	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70009	Magnetic	409289	5796313	A2_h	-	-	-	148	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70010	Magnetic	409411	5796375	A2_l	-	-	-	37	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70011	Dark reflector	409269	5796095	A2_l	18.9	0.8	-	-	Interpreted as a possible natural feature or may be possible linear debris	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70012	Magnetic	409513	5796156	A2_h	-	-	-	198	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70013	Magnetic	409536	5796155	A2_l	-	-	-	13	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70014	Magnetic	409513	5796130	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70015	Magnetic	409562	5796134	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70016	Magnetic	409588	5796138	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70017	Magnetic	409605	5796131	A2_l	-	-	-	25	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70018	Magnetic	409580	5796050	A2_l	-	-	-	52	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-

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		Easting	Northing										
70019	Dark reflector	409487	5795833	A2_l	6.1	0.5	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B04_NSH	Nearshore	-
70020	Magnetic	409609	5795951	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70021	Magnetic	409674	5796148	A2_l	-	-	-	13	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70022	Magnetic	409686	5796177	A2_l	-	-	-	34	Interpreted as a possible natural feature with ferrous content or may be possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70023	Magnetic	409731	5796174	A2_l	-	-	-	13	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70024	Dark reflector	409691	5796089	A2_l	4.6	1.5	0.8	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70025	Magnetic	409771	5796122	A2_l	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70026	Magnetic	409811	5796142	A2_l	-	-	-	22	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70027	Magnetic	409831	5796105	A2_l	-	-	-	18	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70028	Magnetic	409946	5796175	A2_l	-	-	-	19	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70029	Dark reflector	410080	5795747	A2_l	3.4	0.3	-	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70030	Magnetic	410194	5795729	A2_h	-	-	-	128	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70031	Magnetic	410257	5795783	A2_h	-	-	-	190	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70032	Magnetic	410216	5796082	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70033	Dark reflector	410233	5796097	A2_l	2.4	0.9	-	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70034	Debris	410466	5795925	A2_h	8.4	2.1	-	-	Interpreted as possible debris.	SSS Mosaic	SSS_Mosaic_B04_NSH	Nearshore	-
70035	Magnetic	410796	5796147	A2_l	-	-	-	27	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70036	Dark Reflector	411048	5796104	A2_l	8.1	0.8	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B04_NSH	Nearshore	-
70037	Magnetic	411089	5796028	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-

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		Easting	Northing										
70038	Magnetic	411114	5796107	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70039	Magnetic	411156	5796022	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70040	Magnetic	411001	5796465	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70041	Magnetic	411495	5796327	A2_l	-	-	-	54	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70042	Magnetic	411543	5796649	A2_l	-	-	-	90	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70043	Magnetic	411583	5796732	A2_l	-	-	-	27	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70044	Dark reflector	411808	5796428	A2_l	9.7	1.1	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B04_NSH	Nearshore	-
70045	Dark reflector	411806	5796762	A2_l	1.4	1.0	0.3	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70046	Magnetic	412216	5796821	A2_l	-	-	-	53	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70047	Magnetic	412307	5796552	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70048	Magnetic	412356	5796505	A2_l	-	-	-	17	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70049	Magnetic	412914	5796865	A2_l	-	-	-	58	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70050	Magnetic	412995	5796828	A2_l	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70051	Magnetic	412872	5797050	A2_l	-	-	-	18	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70052	Magnetic	413070	5796918	A2_l	-	-	-	22	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70053	Magnetic	412932	5797277	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70054	Magnetic	413027	5797216	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70055	Magnetic	413140	5797325	A2_l	-	-	-	25	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70056	Magnetic	413194	5797247	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-

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		Easting	Northing										
70057	Magnetic	413212	5797320	A2_I	-	-	-	23	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70058	Magnetic	413215	5797356	A2_I	-	-	-	62	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70059	Magnetic	413334	5797270	A2_I	-	-	-	45	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70060	Magnetic	413508	5797171	A2_I	-	-	-	37	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70061	Magnetic	413437	5797413	A2_I	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70062	Magnetic	413494	5797402	A2_I	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70063	Magnetic	413768	5797452	A2_I	-	-	-	81	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70064	Magnetic	413829	5797532	A2_I	-	-	-	82	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70065	Magnetic	413890	5797558	A2_I	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70066	Magnetic	413961	5797517	A2_I	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70067	Dark reflector	414019	5797440	A2_I	11.8	1.0	0.2	-	Interpreted as a possible natural feature or may be possible linear debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70068	Magnetic	413875	5797685	A2_I	-	-	-	51	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70069	Magnetic	414323	5797713	A2_I	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70070	Magnetic	414388	5797653	A2_I	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70071	Magnetic	414386	5797800	A2_I	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70072	Magnetic	414542	5798065	A2_I	-	-	-	11	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70073	Magnetic	414626	5798013	A2_I	-	-	-	94	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70074	Magnetic	414597	5798147	A2_I	-	-	-	6	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70075	Dark reflector	415101	5798226	A2_I	11.9	3.1	-	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-

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		Easting	Northing										
70076	Magnetic	415023	5798276	A2_l	-	-	-	19	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70077	Dark reflector	415326	5798766	A2_l	4.9	1.0	-	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-
70078	Magnetic	415166	5798960	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70079	Magnetic	415601	5798814	A2_l	-	-	-	83	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70080	Magnetic	415465	5798949	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70081	Magnetic	415649	5798883	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70082	Magnetic	415654	5798993	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70083	Magnetic	415802	5799191	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70084	Magnetic	416127	5799281	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70085	Magnetic	415757	5799492	A2_l	-	-	-	39	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70086	Magnetic	415874	5799557	A2_h	-	-	-	116	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70087	Magnetic	416118	5799487	A2_l	-	-	-	41	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70088	Magnetic	416132	5799668	A2_l	-	-	-	22	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70089	Magnetic	416246	5799648	A2_l	-	-	-	26	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70090	Recorded wreck	416562	5799582	A3	-	-	-	-	Reported location of British steamship *Rochester City* which sank 2 May 1916 after hitting a mine. Last observed in 2017 as largely intact and partially buried. Location not covered by these datasets. A 100 m AEZ would impact Draft Order Limits	Historic record	-	Nearshore buffer	10362 (UKHO), 912905 (NMHR)
70091	Magnetic	416372	5799726	A2_l	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70092	Magnetic	416441	5799830	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70093	Linear debris	416215	5799999	A2_h	30.0	0.9	0.1	-	Interpreted as a possible length of linear debris.	Raw SSS	Raw_SSS_B04_NSH	Nearshore	-

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		Easting	Northing										
70094	Magnetic	416753	5800071	A2_l	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B04	Nearshore	-
70095	Magnetic	417060	5800330	A2_l	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70096	Magnetic	417150	5800351	A2_l	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70097	Magnetic	417082	5800604	A2_l	-	-	-	32	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70098	Recorded wreck	417007	5800718	A3	-	-	-	-	Reported location of the British steamship Sunniside, which sunk on 9 November 1916. This location was not covered by these datasets and therefore this record has been retained as a precaution. A 100 m AEZ would impact Draft Order Limits	Historic record	-	Offshore buffer	10365 (UKHO)
70099	Magnetic	417244	5800718	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70100	Magnetic	417541	5800629	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70101	Magnetic	417546	5800682	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70102	Magnetic	417627	5800634	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70103	Magnetic	417641	5800709	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70104	Magnetic	417357	5800954	A2_l	-	-	-	18	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70105	Magnetic	417708	5800977	A2_l	-	-	-	51	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70106	Magnetic	417655	5801064	A2_h	-	-	-	202	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70107	Magnetic	417458	5801164	A2_l	-	-	-	81	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70108	Magnetic	417475	5801188	A2_l	-	-	-	58	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70109	Magnetic	417879	5801003	A2_h	-	-	-	206	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70110	Magnetic	417913	5801001	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70111	Magnetic	417896	5801087	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-

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		Easting	Northing										
70112	Magnetic	417583	5801288	A2_h	-	-	-	122	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70113	Linear debris	417568	5801315	A2_h	68.3	0.4	0.1	18	This is interpreted as a length of linear ferrous debris of unknown origin.	Raw SSS	Raw_SSS_B05	Offshore	-
70114	Magnetic	417546	5801346	A2_l	-	-	-	89	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70115	Magnetic	417852	5801187	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70116	Magnetic	417914	5801168	A2_l	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70117	Magnetic	417774	5801347	A2_l	-	-	-	6	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70118	Magnetic	417854	5801299	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70119	Magnetic	417905	5801263	A2_l	-	-	-	48	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70120	Magnetic	417955	5801285	A2_l	-	-	-	11	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70121	Magnetic	417962	5801295	A2_l	-	-	-	13	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70122	Magnetic	418012	5801271	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70123	Magnetic	418011	5801313	A2_l	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70124	Magnetic	417960	5801349	A2_l	-	-	-	22	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70125	Magnetic	417818	5801471	A2_l	-	-	-	6	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70126	Magnetic	417877	5801445	A2_h	-	-	-	222	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70127	Magnetic	418071	5801512	A2_h	-	-	-	112	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70128	Magnetic	418031	5801591	A2_h	-	-	-	284	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70129	Magnetic	418124	5801534	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70130	Magnetic	417890	5801743	A2_l	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-

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		Easting	Northing										
70131	Magnetic	418101	5801666	A2_l	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70132	Magnetic	417937	5801760	A2_l	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70133	Magnetic	418242	5801705	A2_l	-	-	-	40	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70134	Magnetic	418192	5801743	A2_l	-	-	-	88	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70135	Magnetic	418132	5801879	A2_l	-	-	-	48	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70136	Magnetic	418228	5801854	A2_h	-	-	-	136	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70137	Magnetic	418145	5802065	A2_l	-	-	-	60	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70138	Magnetic	418440	5801998	A2_h	-	-	-	109	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70139	Magnetic	418137	5802166	A2_h	-	-	-	333	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70140	Magnetic	418152	5802189	A2_h	-	-	-	195	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70141	Magnetic	418263	5802239	A2_l	-	-	-	13	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70142	Magnetic	418342	5802192	A2_h	-	-	-	194	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70143	Magnetic	418389	5802146	A2_l	-	-	-	60	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70144	Magnetic	418452	5802293	A2_l	-	-	-	99	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70145	Magnetic	418315	5802427	A2_l	-	-	-	21	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70146	Magnetic	418673	5802234	A2_l	-	-	-	70	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70147	Magnetic	418723	5802365	A2_l	-	-	-	54	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70148	Magnetic	418685	5802418	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70149	Magnetic	418800	5802532	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-

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		Easting	Northing										
70150	Magnetic	418454	5802689	A2_l	-	-	-	18	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70151	Magnetic	418957	5802541	A2_l	-	-	-	42	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70152	Magnetic	418511	5802717	A2_l	-	-	-	7	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70153	Magnetic	418560	5802793	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70154	Magnetic	418900	5803097	A2_l	-	-	-	5	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70155	Magnetic	418995	5803110	A2_l	-	-	-	17	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70156	Magnetic	418984	5803186	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70157	Magnetic	419096	5803243	A2_h	-	-	-	109	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70158	Magnetic	419347	5803033	A2_l	-	-	-	24	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70159	Magnetic	419341	5803129	A2_l	-	-	-	13	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70160	Magnetic	419229	5803314	A2_l	-	-	-	60	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70161	Magnetic	419365	5803208	A2_l	-	-	-	49	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70162	Magnetic	419485	5803512	A2_l	-	-	-	43	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70163	Magnetic	419534	5803489	A2_l	-	-	-	21	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70164	Magnetic	419596	5803472	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B05	Offshore	-
70165	Bright reflector	423214	5803406	A2_l	6.9	0.7	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B06	Offshore	-
70166	Magnetic	423643	5803610	A2_l	-	-	-	27	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B06	Offshore	-
70167	Seabed disturbance	428176	5803258	A2_l	17.6	3.4	0.6	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B06	Offshore	-
70168	Magnetic	429231	5803600	A2_l	-	-	-	25	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag.B07	Offshore	-

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		Easting	Northing										
70169	Magnetic	430115	5803476	A2_l	-	-	-	30	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag.B07	Offshore	-
70170	Dark reflector	430489	5803560	A2_l	7.9	2.4	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B07	Offshore	-
70171	Recorded obstruction	431692	5803645	A3	-	-	-	-	Reported location of a 'foul ground', located at a general depth of 32 m and recorded as a fishermen's fastener. No anomalous features were identified in the geophysical data at this location. Low archaeological interest so no AEZ.	Historic record	-	Offshore	10699 (UKHO), 879963 (NMHR)
70172	Magnetic	431962	5804024	A2_l	-	-	-	27	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag.B07	Offshore	-
70173	Seabed disturbance	432946	5803791	A2_l	8.4	5.8	1.0	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS, MBES	Raw_SSS_B07, MBES_B07	Offshore	-
70174	Mound	434918	5804229	A2_h	31.4	17.1	1.0	-	Interpreted as possible buried debris, but may be a natural feature	MBES	MBES_B07	Offshore	-
70175	Magnetic	436185	5804216	A2_l	-	-	-	26	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag.B07	Offshore	-
70176	Magnetic	440819	5806776	A2_l	-	-	-	23	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B08	Offshore	-
70177	Magnetic	441184	5807046	A2_l	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B08	Offshore	-
70178	Seabed disturbance	441294	5806611	A2_l	22.0	10.5	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B08	Offshore	-
70179	Magnetic	445563	5807791	A2_l	-	-	-	34	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B08	Offshore	-
70180	Mound	452428	5812266	A2_l	5.0	3.8	0.4	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B09	Offshore	-
70181	Magnetic	452573	5814132	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B09	Offshore	-
70182	Mound	452636	5815487	A2_l	9.2	1.8	0.2	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B09	Offshore	-
70183	Mound	452736	5817080	A2_l	5.9	2.7	1.0	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B09	Offshore	-
70184	Magnetic	452497	5817525	A2_l	-	-	-	92	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B09	Offshore	-
70185	Magnetic	455911	5820251	A2_l	-	-	-	17	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B09	Offshore	-
70186	Mound	453443	5819926	A2_l	7.8	7.1	0.3	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B10	Offshore	-

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		Easting	Northing										
70187	Magnetic	454737	5821629	A2_l	-	-	-	42	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70188	Magnetic trend	456506	5823068	A2_l	185.3	-	-	22	A curvilinear trend of indiviudal magnetic responses aligned north-east to south-west, ranging in amplitude from 17 nT to 22 nT. Interpreted as possible ferrous debris either buried or with no surface expression	Mag.	Mag._B10	Offshore	-
70189	Magnetic	459240	5826877	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70190	Magnetic	459283	5826868	A2_l	-	-	-	31	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70191	Magnetic	459446	5826859	A2_l	-	-	-	24	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70192	Magnetic	459586	5826805	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70193	Magnetic	459586	5826970	A2_l	-	-	-	6	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70194	Magnetic	459520	5827420	A2_l	-	-	-	17	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70195	Magnetic	460344	5828247	A2_l	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70196	Magnetic	461334	5829333	A2_l	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70197	Magnetic	461697	5829763	A2_l	-	-	-	56	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70198	Magnetic	461601	5829936	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70199	Dark reflector	462201	5830614	A2_l	5.1	1.3	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B10	Offshore	-
70200	Magnetic	462856	5831179	A2_l	-	-	-	63	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B10	Offshore	-
70201	Magnetic trend	463019	5831308	A2_l	345.0	-	-	39	A linear trend of individual magnetic responses aligned north-east to south-west, ranging in amplitude from 13 nT to 39 nT. Interpreted as possible ferrous debris either buried or with no surface expression	Mag.	Mag._B10, Mag._B11	Offshore	-
70202	Magnetic	463154	5831568	A2_l	-	-	-	32	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B11	Offshore	-

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		Easting	Northing										
70203	Magnetic	463488	5832001	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B11	Offshore	-
70204	Dark reflector	464199	5832428	A2_l	10.4	1.5	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B11	Offshore	-
70205	Magnetic	464251	5832558	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B11	Offshore	-
70206	Mound	464300	5832990	A2_l	7.3	3.5	0.2	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B11	Offshore	-
70207	Magnetic	465107	5833412	A2_l	-	-	-	34	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B11	Offshore	-
70208	Magnetic	467695	5836969	A2_l	-	-	-	35	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B11	Offshore	-
70209	Seabed disturbance	468120	5837163	A2_l	13.1	10.9	0.4	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS, SSS Mosaic, MBES	Raw_SSS_B11, SSS_Mosaic_B11, MBES_B11	Offshore	-
70210	Seabed disturbance	467990	5837308	A2_l	15.1	15.0	0.5	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B11	Offshore	-
70211	Seabed disturbance	468123	5837242	A2_l	63.4	20.9	0.7	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS, SSS Mosaic, MBES	Raw_SSS_B11, SSS_Mosaic_B11, MBES_B11	Offshore	-
70212	Seabed disturbance	468207	5837253	A2_l	8.1	5.9	0.3	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS, MBES	Raw_SSS_B11, MBES_B11	Offshore	-
70213	Seabed disturbance	468338	5837366	A2_l	6.2	6.0	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B11	Offshore	-
70214	Magnetic	472610	5843290	A2_l	-	-	-	17	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-
70215	Magnetic	472541	5843603	A2_l	-	-	-	26	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-
70216	Mound	472257	5843845	A2_l	5.5	3.7	0.3	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B12	Offshore	-
70217	Magnetic	472466	5844255	A2_l	-	-	-	17	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-
70218	Magnetic	472465	5844300	A2_l	-	-	-	27	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-
70219	Magnetic	472204	5844925	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-
70220	Magnetic	472565	5845197	A2_l	-	-	-	34	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-

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		Easting	Northing										
70221	Mound	472471	5846209	A2_l	10.7	2.2	0.2	-	Interpreted as a possible natural feature or may be possible linear debris.	MBES	MBES_B12	Offshore	-
70222	Mound	472396	5846216	A2_l	7.2	3.1	0.2	-	Interpreted as a possible natural feature or may be possible linear debris.	MBES	MBES_B12	Offshore	-
70223	Mound	472401	5846228	A2_l	12.0	2.1	0.3	-	Interpreted as a possible natural feature or may be possible linear debris.	MBES	MBES_B12	Offshore	-
70224	Mound	472335	5846287	A2_l	5.0	2.5	0.2	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic, MBES	SSS_Mosaic_B12, MBES_B12	Offshore	-
70225	Mound	472429	5846306	A2_l	20.5	2.2	0.4	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B12	Offshore	-
70226	Seabed disturbance	472423	5846322	A2_l	22.7	13.2	0.6	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B12	Offshore	-
70227	Seabed disturbance	472417	5846351	A2_l	10.8	7.4	0.3	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B12	Offshore	-
70228	Magnetic	472434	5851628	A2_l	-	-	-	11	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B12	Offshore	-
70229	Linear debris	471934	5860446	A2_h	24.7	0.3	0.1	-	Interpreted as a possible short length of linear debris, such as a rope or chain.	Raw SSS, SSS Mosaic	Raw_SSS_B13, SSS_Mosaic_B13	Offshore	-
70230	Mound	471936	5860458	A2_l	12.1	5.3	1.2	-	Interpreted as a possible natural feature or may be possible debris.	Raw SSS, SSS Mosaic, MBES	Raw_SSS_B13, SSS_Mosaic_B13, MBES_B13	Offshore	-
70231	Linear debris	471939	5860469	A2_h	26.0	0.3	0.1	-	Interpreted as a possible short length of linear debris, such as a rope or chain.	Raw SSS, SSS Mosaic	Raw_SSS_B13, SSS_Mosaic_B13	Offshore	-
70232	Mound	472846	5865625	A2_l	7.5	2.5	0.1	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B14	Offshore	-
70233	Mound	473198	5868842	A2_l	7.7	2.6	0.2	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B14	Offshore	-
70234	Seabed disturbance	473134	5870350	A2_l	47.5	19.4	0.2	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B14	Offshore	-
70235	Mound	472880	5873027	A2_l	57.7	3.5	0.4	-	Interpreted as a possible natural feature or may be possible linear debris.	MBES	MBES_B14	Offshore	-
70236	Magnetic	473290	5874516	A2_l	-	-	-	16	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B14	Offshore	-
70237	Magnetic	473299	5875415	A2_l	-	-	-	29	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B14	Offshore	-

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		Easting	Northing										
70238	Magnetic	475284	5877858	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B15	Offshore	-
70239	Magnetic	480243	5880075	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B15	Offshore	-
70240	Magnetic	480210	5880135	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B15	Offshore	-
70241	Debris	481272	5880389	A2_h	5.4	1.0	-	-	Interpreted as possible debris.	SSS Mosaic, MBES	SSS_Mosaic_B15, MBES_B15	Offshore	-
70242	Magnetic	482070	5880786	A2_l	-	-	-	99	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B15	Offshore	-
70243	Seabed disturbance	483046	5881571	A2_l	7.6	6.3	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B15	Offshore	-
70244	Magnetic	484480	5883139	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B16	Offshore	-
70245	Dark reflector	484378	5883946	A2_l	8.4	0.9	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B16	Offshore	-
70246	Magnetic	485120	5885725	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B16	Offshore	-
70247	Magnetic	485422	5885895	A2_l	-	-	-	33	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B16	Offshore	-
70248	Magnetic	486012	5886569	A2_l	-	-	-	14	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B16	Offshore	-
70249	Dark reflector	486049	5886985	A2_l	8.4	2.7	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B16	Offshore	-
70250	Dark reflector	486380	5888638	A2_l	7.3	0.9	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B16	Offshore	-
70251	Dark reflector	490856	5891662	A2_l	8.5	0.8	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B17	Offshore	-
70252	Magnetic	491705	5891885	A2_l	-	-	-	27	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B17	Offshore	-
70253	Magnetic	491526	5892007	A2_l	-	-	-	43	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B17	Offshore	-
70254	Magnetic	491599	5891996	A2_l	-	-	-	12	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B17	Offshore	-
70255	Magnetic	491409	5892182	A2_l	-	-	-	40	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B17	Offshore	-
70256	Dark reflector	492049	5892320	A2_l	6.2	5.3	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B17	Offshore	-

ID	Classification	Position (ETRS89 UTM31N)		Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Interpretation	Anomaly type	Dataset	Section	External references
		Easting	Northing										
70257	Magnetic	492519	5892911	A2_l	-	-	-	18	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B17, Mag._B18	Offshore	-
70258	Dark reflector	492982	5893319	A2_l	6.3	0.7	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70259	Magnetic	493531	5896025	A2_l	-	-	-	6	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70260	Magnetic	493512	5896336	A2_l	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70261	Magnetic	493968	5896541	A2_l	-	-	-	8	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70262	Dark reflector	494221	5897742	A2_l	6.3	2.4	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70263	Magnetic	494305	5897818	A2_l	-	-	-	9	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70264	Magnetic	494352	5898700	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70265	Magnetic	494612	5899412	A2_l	-	-	-	10	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70266	Magnetic	494533	5899675	A2_l	-	-	-	20	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70267	Magnetic	494489	5899713	A2_l	-	-	-	6	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70268	Seabed disturbance	494816	5900650	A2_l	17.8	6.4	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70269	Seabed disturbance	495249	5900961	A2_l	20.8	3.1	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70270	Magnetic	495481	5903150	A2_l	-	-	-	15	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70271	Dark reflector	495645	5903556	A2_l	5.2	2.3	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70272	Dark reflector	496070	5905183	A2_l	6.5	3.4	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70273	Mound	496597	5905671	A2_l	5.6	1.3	0.1	-	Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_B18	Offshore	-
70274	Magnetic	496303	5905789	A2_l	-	-	-	22	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-
70275	Magnetic	496357	5905798	A2_l	-	-	-	38	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B18	Offshore	-

ID	Classification	Position (ETRS89 UTM31N)		Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Interpretation	Anomaly type	Dataset	Section	External references
		Easting	Northing										
70276	Dark reflector	496734	5906409	A2_l	16.0	0.6	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70277	Dark reflector	496544	5906620	A2_l	23.4	0.6	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70278	Dark reflector	496551	5906626	A2_l	33.6	0.7	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B18	Offshore	-
70279	Dark reflector	496904	5906798	A2_l	20.2	0.7	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B19	Offshore	-
70280	Magnetic	497615	5909779	A2_l	-	-	-	29	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B19	Offshore	-
70281	Magnetic	497556	5909947	A2_l	-	-	-	24	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B19	Offshore	-
70282	Dark reflector	497905	5911076	A2_l	9.8	4.4	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B19	Offshore	-
70283	Dark reflector	498114	5911210	A2_l	15.4	3.1	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B19	Offshore	-
70284	Magnetic	498555	5913035	A2_l	-	-	-	48	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B19	Offshore	-
70285	Magnetic	499789	5916779	A2_l	-	-	-	56	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B19	Offshore	-
70286	Dark reflector	499769	5917076	A2_l	8.4	1.8	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B19	Offshore	-
70287	Magnetic	500272	5918176	A2_l	-	-	-	21	Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	Mag._B19	Offshore	-
70288	Dark reflector	500731	5919875	A2_l	13.8	0.6	-	-	Interpreted as a possible natural feature or may be possible debris.	SSS Mosaic	SSS_Mosaic_B19	Offshore	-

1. Co-ordinates are in WGS84 UTM31N
2. Positional accuracy estimated ±10 m

Appendix 6: Maritime Recorded Losses

NMHR ID	HER ID	Name	Nationality	Type	Construction	Build	Lost	Reason for Loss	Journey
1450895	MSF46107 / SWD136	Unknown	British	Cargo Vessel	Wood	Unknown	1299	Foundered	
1450896	MSF46107 / SWD136	Unknown	British	Cargo Vessel	Wood	Unknown	1299	Foundered	
1583892		Battle Of Solebay 1672	N/A	Battle	N/A	Unknown	1672	N/A	
	MSF46105 / SWD134	*St John*	British	Craft	Wood	Unknown	1727	Lost	Norway to King's Lynn
913645	MSF46118 / SWD143	*Elizabeth*	British	Craft	Wood	Unknown	1744	Lost	Newcastle to Dunkirk
913651	MSF46121 / SWD144	*Maiters*	British	Craft	Wood	Unknown	1757	Lost	London to Kingston upon Hull
1311850	MSF46110 / SWD139	Unknown	British	Collier	Wood	Unknown	1772	Stranded	
1213722	MSF46136 / SWD158	*Dingley*	British	Cargo Vessel	Wood	Unknown	1774	Stranded	Stockholm to London
1387735	MSF46137 / SWD159	*Cerf Volant*	French	Privateer	Wood	Unknown	1781	Stranded	
913671	MSF46122 / SWD145	*Dorothea and Margaretta*	Unknown	Cargo Vessel	Wood	Unknown	1793	Lost	London to Bergen
1393466	MSF46138 / SWD160	*Phillip and Ann*	British	Cargo Vessel	Wood	Unknown	1798	Stranded	
913688	MSF46134 / SWD156	*Elizabeth*	British	Cargo Vessel	Wood	Unknown	1801	Stranded	Kind's Lynn to London
1300573	MSF46087 / SWD116	*Henry*	British	Craft	Wood	Unknown	1802	Lost	Cley to London
1338781	MSF46102 / SWD131	*True Friend*	British	Craft	Unknown	Unknown	1802	Driven ashore	

NMHR ID	HER ID	Name	Nationality	Type	Construction	Build	Lost	Reason for Loss	Journey
1301370	MSF46093 / SWD122	*Neta Henderika*	Unknown	Craft	Unknown	Unknown	1803	Driven ashore	
1394996	MSF46139 / SWD161	*Unity*	British	Cargo Vessel	Wood	Unknown	1803	Stranded	
1301375	MSF46094 / SWD123	*Union*	British	Cargo Vessel	Wood	Unknown	1805	Wrecked	Southwold to London
1340685	MSF46103 / SWD132	*Apollo*	British	Cargo Vessel	Wood	Unknown	1807	Stranded	Sunderland to Sandwich
1301408	MSF46095 / SWD124	*Union*	British	Cargo Vessel	Wood	Unknown	1809	Stranded	Sunderland to Weymouth
882176	MSF46115 / SWD140	*Henry*	British	Craft	Wood	Unknown	1810	Stranded	
1583529	MSF46108 / SWD137	Unknown	Unknown	Fishing Vessel	Wood	Unknown	1810	Stranded	
1301459	MSF46097 / SWD126	*Friendship*	British	Cargo Vessel	Unknown	Unknown	1811	Driven ashore	Sunderland to London
1301450	MSF46096 / SWD125	*Nelson*	British	Cargo Vessel	Unknown	Unknown	1811	Driven ashore	
1300873	MSF46088 / SWD117	*Friends*	British	Craft	Unknown	Unknown	1812	Driven ashore	London to King's Lynn
	MSF46091 / SWD120	*Friendship*	British	Craft	Unknown	Unknown	1812	Driven ashore	London to King's Lynn
1300896	MSF46089 / SWD118	*Hull Packet*	British	Cargo Vessel	Wood	Unknown	1813	Wrecked	London to King's Lynn
1300956	MSF46092 / SWD121	*Friends*	British	Cargo Vessel	Unknown	Unknown	1814	Driven ashore	To London
1300952	MSF46090 / SWD119	*Vrow Jetze*	Dutch	Craft	Unknown	Unknown	1814	Driven ashore	Groningen to London
1401821	MSF46140 / SWD162	*Ann*	British	Cargo Vessel	Wood	Unknown	1815	Collision	

NMHR ID	HER ID	Name	Nationality	Type	Construction	Build	Lost	Reason for Loss	Journey
1344167	MSF46104 / SWD133	*Argo*	British	Cargo Vessel	Unknown	Unknown	1815	Collision	Sunderland to Southwold
913691	MSF46133 / SWD155	*Conqueror*	British	Brig	Unknown	1804	1817	Ran ashore	From Newcastle
913692	MSF46135 / SWD157	*Maria Ross*	British	Cargo Vessel	Wood	Unknown	1818	Stranded	
1246280	MSF46086 / SWD115	*Providence*	British	Craft	Wood	Unknown	1834	Foundered	
1371048	MSF46106 / SWD135	*Lord Nelson*	British	Smack	Unknown	1804	1844	Wrecked	
913693	MSF46123 / SWD146	*Spring*	British	Craft	Unknown	Unknown	1852	Stranded	Middlesborough to Southwold
913695	MSF46132 / SWD154	*William Cook*	British	Schooner	Unknown	Unknown	1852	Stranded	
1337547	MSF46098 / SWD127	*Sheraton Grange*	British	Snow	Unknown	Unknown	1853	Collision	
913811	MSF46127 / SWD149	Unknown	British	Craft	Unknown	Unknown	1855	Lost	
913706	MSF46128 / SWD150	*Billy*	British	Snow	Unknown	1811	1866	Stranded	
1337991	MSF46099 / SWD128	*Jane Innes*	British	Brigantine	Unknown	1854	1875	Foundered	
1338331	MSF46100 / SWD129	*Cowan*	British	Brig	Unknown	1839	1878	Stranded	
1338343	MSF46101 / SWD130	*Eliza B*	British	Brig	Unknown	1861	1879	Foundered	
913873	MSF46126 / SWD148	*Martino Maria*	British	Braque	Unknown	1863	1881	Stranded	
913975	MSF46116 / SWD141	*Nordhavet*	Norwegian	Barque	Unknown	Unknown	1887	Stranded	

NMHR ID	HER ID	Name	Nationality	Type	Construction	Build	Lost	Reason for Loss	Journey
914506	MSF46131 / SWD153	*James And Eleanor*	British	Brig	Unknown	1868	1895	Stranded	
913999	MSF46117 / SWD142	*Daisy*	British	Ketch	Wood	Unknown	1899	Collision	
914030	MSF46129 / SWD151	*Ivanhoe*	British	Ketch	Wood	1891	1907	Collision	
914063	MSF46130 / SWD152	*Idun*	Norwegian	Braque	Wood	1894	1912	Stranded	Antwerp to Cadiz

Appendix 7: Aviation Recorded Losses

NMHR ID	HER ID	Name	Type of craft	Nationality	Lost	Area
1357348	MSF46141 / SWD163	Hampden MK I X2901	Bomber	British	1940	Suffolk
1357352	MSF46142 / SWD164	Wellington MK III X3308	Heavy Night Bomber	British	1940	Suffolk
1356808	MSF46143 / SWD165	Stirling MK III EE892	Heavy Bomber	British	1943	Suffolk
1404897	MSF46125 / SWD147	Junker Ju88	Junker	German	1944	Suffolk

Appendix 8: Intertidal Sites and Findspots

WA ID	Type	Period	Description	Position (ETRS89 UTM31N)		Associated Reference
				Easting	Northing	
1001	Flood Defences	Post Medieval to Second World War	A stretch of sea bank, c 1.75 km long can be seen as an earthwork on aerial photographs south-east of Walberswick dating from 1941 and 1945. It is slightly fragmented at its southern end. The bank is likely to be a component in the flood defence system in this area and may well date back to the post medieval period, as a number of other similar banks in this area also do. The bank is depicted on the 1st Ed County Series OS 25" map for this area, which dates back to c. 1884, which further strengthens the case for it being a post-medieval feature. There is another small section of bank, c. 100 m long, to the north of the longer stretch, which is located on the opposite side of the channel. By comparing it with the depiction on the 1st Ed County Series OS map, it is possible to see that a large proportion of the feature has in fact eroded away.	407949.68	5795678.37	HER_MXS19424 / WLB005
1002	Beach Defence; Barbed Wire Obstruction; Minefield; Anti Tank Scaffolding	Second World War	Barbed wire beach defences and defensive scaffolding can be seen running along the beach between Walberswick and Dunwich on a number of aerial photographs from the 1940s. Various sections of scaffolding and barbed wire form a more or less continuous length of defences along the beach, covering more than 5.5 km. The defences run between TM50417478 & TM47866988 and include a small area of minefield at TM48047109. Additional defences in the form of vertical poles possibly set in concrete, known as 'dragons teeth', can also be seen in the breakers on oblique photographs of 1941. North of the car park, next to the seawall, Dunwich Anti-tank scaffolding buried under the cliff top at Dunwich.	408796.24	5796154.28	HER_MSF26413 / DUN029
1003	Pottery Kiln	Medieval	Possible Medieval pottery production site identified from surface finds of pottery. The pottery was of soot-blackened cooking pots which were found on the beach near to another possible production site at TM 50057438 (TM 57 SW 1).	408965.24	5796348.36	NMHR_1248502
1004	Artefact Scatter	Medieval	C15 pottery including cooking pot with sagging base and strap decoration and another with horizontal handles.	409024.38	5796399.43	HER_MSF1866 / WLB005
1005	Pillbox?; Military Feature?	Second World War	A small cluster of 10 structures, c. 2 m across at the most, can be seen on the beach to the south-east of Walberswick on aerial photographs from June 1941. There is also a larger structure, which would appear to be a pillbox, at	409050.55	5796415.01	HER_MXS19415 / WLB045

WA ID	Type	Period	Description	Position (ETRS89 UTM31N)		Associated Reference
				Easting	Northing	
			TM49967438. The function of the smaller features is unclear, and it may be that they are temporary features, or possibly military supplies, laid out in storage. On aerial photographs from November 1941, the larger structure is still visible 'in situ', but the smaller features are in a much less regular order, and there do not appear to be quite so many of them. This suggests that they were either items being stored near the pillbox, or possibly temporary structures.			
1006	Building, Pottery Kiln, Findspot	Early Medieval to Medieval	Alleged pottery kilns and pottery 13th/14th century and 17th century in date were exposed during low tides and after flooding. A feature reported variously as a kiln with apsidal end and a row of rectangular huts, was recorded on the seaward side of a peat bar. Early medieval pottery was also recovered from the site. Excavations failed to locate any features. Field investigations in 1974 located no traces of medieval occupation. The site was on a sand and shingle bar backed by salt marsh on an eroding coastline.	409120.29	5796417.76	NMHR_392431
1007	Artefact Scatter	Medieval	Same as Dunwich 12.	409120.29	5796417.76	HER_MSF13398 / WLB006
1008	Barbed Wire Obstruction; Pillbox	Second World War	A section of barbed wire obstruction c. 150 m long is visible as a structure between TM50037433 & TM50097456 on 1941 aerial photographs. The barbed wire is not visible on aerial photographs by 1945, but there does appear to be a small square structure at TM50017444, which may well be a pillbox.	409130.69	5796526.7	HER_MXS19413 / WLB043
1009	Settlement; Building; House; Artefact Scatter	Medieval	Medieval artefact scatter, including a pitcher, pottery sherds and a leather shoe sole.	409171.52	5796434.25	HER_MSF1867 / DUN012
1010	Findspot	Unknown	Outline Record: Human skeletal material	409178.42	5796533.95	HER_MSF33851 / SWD072
1011	Natural Feature	Pioneering late Mesolithic to Early Bronze Age	November 1999: Sub rectangular rafts of well-humidified peat found on high tide mark at Walberswick beach. Max length 1.8 m; max thickness 0.55 m. Clearly eroded from close off-shore outcrops, comparable to deposits on Southwold town marshes. R/C dated to 6755/6510 BP & 4575/4300 BP. (Suffolk Archaeological Services)	409219.49	5796483.38	HER_MSF18763 / WLB130

WA ID	Type	Period	Description	Position (ETRS89 UTM31N)		Associated Reference
				Easting	Northing	
1012	Artefact Scatter	Later Prehistoric	A Neo (?) settlement uncovered by rough seas, revealing many flint flake tools, several fragments of pottery and bone/antler artefacts (one being a pick). Once in the collection of Mr English of Walberswick but now mostly dispersed to schools and relatives. Two weaving weights (Middle Bronze Age or later) are now in Southwold Museum and the antler pick in a private collection. (Suffolk Archaeological Services).	409278.1	5796527.05	HER_MSF9129 / SWD005
1013	Artefact Scatter	Medieval	Sherds, including C13-C14 and fragment of figure of mounted knight found on beach in 1963 per G Burroughes.	409391.59	5796719.53	HER_MSF1864 / SWD002
1014	Feature	Unknown	Outline Record: Ring Ditch	409429.22	5795815.41	HER_MSF30325 / REY057
1015	Fortification	Unknown	Suggested ancient encampment said to exist at Eye Cliff (local tradition says it was occupied by the Danes). (Goult W, A Survey of Suffolk Parish History: East Suffolk I-Y, 1990).	409577.18	5796506.36	HER_MSF17619 / SWD058

Appendix 9: Historic Environment beyond MHWS

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
DSF10270	285564		Public house	Post Medieval	Grade II listed building. The Bell Hotel public house.	409048.6	5796829	Point
DSF10271	285565		Farmhouse	Post Medieval	Grade II listed building. The Valley Farmhouse.	409092.2	5796822	Point
DSF10743	285566		House	Post Medieval	Grade II listed building. The Bell Cottage house.	409077.6	5796843	Point
DSF11437	285567		House	Post Medieval	Grade II listed building. The Potter's Wheel house.	408908.9	5796779	Point
		392145	Findspot	Mesolithic	Mesolithic perforated antler mattock was found at TM 496741 and retained by finder, E English.	408652.37	5796169.66	Point
		392143	Findspot	Neolithic	Neolithic implements found	408580.26	5796575.33	Polygon
		392140	Artefact Scatter	Roman	Romano-British potsherds were found on a field surface at Walberswick in 1958.	408629.59	5796369.18	Point
MSF12476	WLB010		Findspot	Roman	Metal detected finds (mainly PMed) from large area (1991). Only Roman finds - one Hod Hill type brooch and one bronze Roman coin.	408370.04	5796505.77	Polygon
MSF14448	WLB015		Findspot	Roman	Metal detector find, corroded bronze coin, C3?	408459.55	5796650.12	Polygon
MSF1868	WLB007		Artefact Scatter	Roman	Roman sherds found south of village.	408731.22	5796520.87	Polygon
MSF25241	WLB080		Settlement; Town	Early Saxon to Medieval	Area of high archaeological potential defining area of probable settlement from the Saxon to medieval periods.	408379.92	5796657.75	Polygon
MSF47328	WLB140		Settlement	Saxon to Post Medieval	Anomalies indicating multi period settlement activity and road. Gradiometer survey undertaken in 2024 has been successful in detecting anomalies of archaeological origin across the site in the form of a large overarching road and multiple examples of	408416.68	5796556.91	Polygon

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
					settlement activity, possibly from the Saxon to post-medieval period.			
		392147	Deserted settlement	Medieval	Deserted Mediaeval village sited from documentary sources.	408254.31	5796198.07	Polygon
MSF9131	WLB010		Church; Artefact Scatter	Medieval	Possible original site of Walberswick church and settlement, as evidenced through artefact scatter and gradiometer survey which successfully detected anomalies of archaeological origin across the site in the form of a large overarching road and multiple examples of settlement activity, possibly from the Saxon to post-medieval period.	408299.84	5796443.63	Polygon
MSF14327	WLB012		Church; Artefact Scatter	Medieval	Relatively dense scatter of Med pottery containing smaller area of flint rubble (church site?) located during fieldwalking survey by John Newman (1992-1993).	408188.94	5796229.95	Polygon
MSF14328	WLB015		Artefact Scatter	Medieval	Area of relatively dense (& widespread) Med pottery scatter found during fieldwalking survey by John Newman (1992-1993). Metal detector finds including 4 Nuremberg and 4 other jettons.	408337.15	5796453.84	Polygon
MSF1870; MSF7535	WLB009		Dock; Artefact Scatter	Medieval to Post Medieval	Medieval and Post Medieval pottery scatter around the site of the Medieval port of Walberswick near Oldtown Marshes. Area of old town`dock', apparently timbers survive and can be seen at low tide -? quay structure. Not shown on Hodskinsons 1783 or later maps.	408365.17	5796219.11	Polygon
MSF25182	WLB073		Ditch; Post Hole; Beam Slot	Medieval to Post Medieval	Monitoring revealed pits, post-holes and ditches of uncertain, but probably medieval date and finds of medieval and post-medieval date were recovered.	408892.29	5796814.44	Polygon
MSF46596	WLB138	392150	Structure	Post Medieval	The site of a post mill believed to have blown down in 1924.	408671.74	5796739.29	Point
MSF14891	WLB131		Lime kiln	Post Medieval	Lime kiln mapped at (South Gayfer) Quay, Walberswick, at TM 499 748. Possibly just in Southwold parish. In 1630 Thomas Rannales of Walberswick is listed as a lime burner.	409053.01	5796893.22	Point

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
MSF18746	SWD014		Monument	Post Medieval	Hulk / Wreck. Dunwich River.	409175.58	5796852.91	Polygon
MSF12475	WLB010		Findspot	Post Medieval	Metal detected finds from large area, N of WLB 009, identified from photographs (1991). Finds include predominantly very late Med/Tudor and early PMed (late C15-C17) finds plus assorted C18 & C19 objects and coins. General settlement scatter plus possibility of market/fair activity on the edge of the village in late C15-C17.	408333.59	5796496.63	Polygon
MSF14447	WLB015		Findspot	Post Medieval	Metal detector finds, bronze coins, various; lead wool seal fragment; also three bronze trade tokens.	408459.55	5796650.12	Polygon
MSF24380	WLB121		Pit; Post Hole	Post Medieval	Monitoring of the footing trenches revealed two post-medieval pits and a post hole. Formerly recorded as WLB MISC	408976.45	5796770.3	Polygon
MXS19417	WLB047		Flood Defences	Post Medieval to Modern	An 825m length of sea bank is visible as an earthwork to the south of Walberswick on 1945 aerial photographs. It runs along the western edge of a channel and some coastal saltmarsh and would probably have formed part of the system of flood defences in this area. Many of these flood defence banks have their origins in the post-medieval period, so it is quite likely that these do too. They may well have been associated with other banks in the area (see WLB 038 and WLB 046).	408739.66	5796439.29	Polygon
MXS19402	SWD034		Flood Defences; Bank (Earthwork)	Post Medieval to Second World War	A stretch of sea bank c. 1 km in length on the southern edge of the River Blyth near Walberswick.	408827	5797418.8	Polygon
MXS19407	WLB038		Flood Defences	Post Medieval to Second	A section of sea bank c. 350 m long can be seen to the east of Walberswick, running along the eastern edge of a creek as an earthwork on a 1945 aerial photograph. The bank is depicted on the OS 1st Ed 25" county series map of c1884, which is an	408970.32	5796561.76	Polygon

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
				World War	indication that this feature has its origins as an element of the post-medieval flood defences in this area.			
MXS19416	WLB046		Flood Defences	Post Medieval to Second World War	A section of sea bank c. 650 m long is visible as an earthwork on 1945 aerial photographs. It runs between TM49357421 & TM49907434 and is not complete, but in 3 main sections. The bank would have been a part of the flood defences in this area and may well date to the post-medieval period, as a number of similar features in this area do.	408691.26	5796304.7	Polygon
		1425896	Anti Tank Cube, Tank Trap, Anti Tank Obstacle	Second World War	Second World War anti-tank cubes. A long row of 4ft square cubes stretching from car park to beach huts. All are laid outside to side. Near beach, South of Walberswick, in front of beach huts.	408915.39	5796351.8	Point
		1443350	Pillbox	Second World War	Site of Second World War pillbox on Town Salts, Walberswick.	408909.13	5796348.23	Point
MSF46566	SWD 166	1425898	Anti Tank Cube, Tank Trap, Anti Tank Obstacle	Second World War	Second World War anti-tank cubes. 6 cubes in a row, laid outside to side. South-East of bridge leading to car park and beach, South of Walberswick.	409140.93	5796685.48	Point
MSF46567	SWD 167	1425897	Anti Tank Cube, Tank Trap, Anti Tank Obstacle	Second World War	Anti-tank cubes. Approx. 15 cubes in a row that curves to the W at N end. At N end the cubes seem to have been moved out of line. Each cube has marks of vertical shuttering on sides. South-East of bridge leading to car park and beach, South of Walberswick .	409118.36	5796612.31	Point
		1443351	Barrel Flame Trap, Flame Device	Second World War	Site of Second World War barrel flame trap at the South end of Ferry Road, Walberswick, on the West side of the road.	408885.49	5796730.51	Point
		1426944	Pillbox	Second World War	Second World War concrete pillbox [plotted from German aerial photograph]. Walberswick, near inn.	409006.61	5796946.52	Point

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
MSF26423	WLB 083		Pillbox (variant)	Second World War	In undergrowth and light woodland overlooking marshes, Walberswick Pillbox variant. There are six sides to the structure, three face S and each has an embrasure, but without shelves or gun mountings. Traces of green paint on the outside reflects camouflage scheme. The interior is painted white and there are no rear facing embrasures.	408616.31	5796372.5	Point
		1425948	Pillbox	Second World War	Second World War pillbox variant. In undergrowth and light woodland overlooking marshes, Walberswick.	408657.5	5796497.84	Polygon
		1425950	Pillbox	Second World War	A Second World War pillbox variant, sometimes termed a 'Suffolk Square'. Facing South. At West end of a small field, near public footpath, South of Walberswick.	408649.23	5796524.13	Polygon
		1425949	Pillbox	Second World War	A Second World War pillbox variant, sometimes termed a 'Suffolk Square'. Near public footpath South of Walberswick.	408638.12	5796499.85	Polygon
MXS19411	WLB042		Barbed Wire Obstruction	Second World War	An L-shaped section of barbed wire obstruction, c. 230 m long, can be seen as a structure on grassland close to the beach west of Walberswick on 1941 and 1945 aerial photographs. The barbed wire is interrupted by a line of anti-tank cubes (WLB 041) and appears to be a part of the World War II coastal defences in this area.	409079.22	5796618.96	Polygon
MXS19414	WLB044		Pillbox; Barbed Wire Obstruction; Trench; Pillbox (variant)	Second World War	An irregular semi-circular stretch of barbed wire can be seen as a structure on 1941 aerial photographs to the south of Walberswick. It partially encloses a length of trench, with associated bank and 2, or possibly 3, pillboxes. The pillboxes are located at TM49587442, TM49567443 and TM49577445. These features are most likely to have functioned together as some kind of military strongpoint during World War II, as part of the defence of the coast in this area. The trenches and pillboxes can still be seen on photographs from 1945, while only very faint, fragmentary traces of the location of the barbed wire are visible	408610.75	5796381.26	Polygon

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
					by that date. Two square and one hexagonal pillbox at Walberswick. Near public footpath S of Walberswick A pillbox variant, sometimes termed a 'Suffolk Square'. Very overgrown. At W end of a small field, near public footpath, S of Walberswick Pillbox, facing S.			
MXS19418	WLB048		Practice Trench	Second World War	A small slit trench, of World War II date, is visible as an earthwork at TM49667448, to the west of Walberswick, on 1941 aerial photographs. It is likely that it was used for practice purposes during the World War II period. The trench has been filled in by 1945, but the area where it is still distinctive from the rest of the grassland in the area.	408750.76	5796550.51	Polygon
MXS19422	WLB052		Barbed Wire Obstruction	Second World War	A c. 200 m stretch of barbed wire obstruction is visible between TM49177454 & TM49347446, close to Walberswick, on 1941 aerial photographs. The feature is probably of World War II date and would have been part of the extensive defences found in this area during that period	408339.22	5796636.59	Polygon
MXS19409	WLB040		Pillbox	Second World War	A square pillbox c. 4 m across is visible at the end of a section of sea bank in Walberswick parish on 1945 aerial photographs. It appears to have an associated blast wall and is most likely to be of World War II date.	409037.22	5796956.54	Polygon
MXS19408	WLB039		Bomb Crater	Second World War	A bomb crater of World War II date on a piece of land behind the old Vicarage in Walberswick can be seen on aerial photographs from 1941. The bomb which caused this crater fell at some time between July 1940 and June 1941, as there is no trace of the bomb crater on an earlier aerial photograph from 1940.	409006.23	5796913.6	Polygon
MXS19419	WLB049		Practice Trench	Second World War	A small section of slit trench, most likely of World War II date, can be seen as an earthwork at TM49637457, in a garden in Walberswick on 1940 aerial photographs. The trench would probably have been used for defensive or practice purposes during World War II.	408718.48	5796644.74	Polygon

HER ID	Alternative HER ID	NMHR ID	Type	Period	Description	Position (ETRS89 UTM31N)		Shape
						Easting	Northing	
MXS19428	WLB055		Slit Trench	Second World War	What appear to be three small slit trenches, each no more than 10 m long, are visible as earthworks at TM49387440, on 1941 aerial photographs. These trenches may have been used for practice or defensive purposes during World War II. They are no longer visible on aerial photographs from 1945, although there appears to be discolouration in the land surface around the area in which the trenches were located.	408456.13	5796488.11	Polygon
MXS19420	WLB050		Bomb Crater	Second World War	A bomb crater, c. 13 m in diameter, is visible on 1941 aerial photographs, to the east of Walberswick. It is of World War II date and can still be seen on photographs from 1945.	408872.45	5796335.6	Polygon
MSF30964	WLB071		Artefact Scatter	18th to 20th c.	Archaeological monitoring revealed a scatter of 18th century stoneware, bottle glass, iron masonry nails and ceramic building material. No features were identified.	408727.37	5796785.29	Polygon
MSF30971	WLB089	1581004	Dwelling	19th c.	Tow's Cabin is thought to have been a workshop dating to the 19th century. A local fisherman Tow Cooper moved the cabin in the 1920s and extended it, turning it into a family dwelling. The cabin is a prefabricated structure on bricks, clad in corrugate	409099.41	5796839.93	Point
MSF33852	WLB106		Allocated Number	Unknown	Outline Record: Undated skeleton of a woman found in 1850s.	408691.43	5796738.89	Point
MSF34072	WLB108		Allocated Number	Unknown	Outline Record: 15th to 16th century cistern with bunghole and Moorish coin found on Walberswick Beach.	409060.84	5796474.29	Point
MSF12477	WLB012		Sub rectangular Enclosure	Unknown	Cropmark of adjoining rectangular or sub rectangular enclosure/s South of WLB 010 and immediately W of WLB 009.	408188.94	5796229.95	Polygon
MSF1869	WLB008		Findspot	Unknown	Perforated antler object, possibly pick, possibly kept by finder.	408711.36	5796218.75	Polygon

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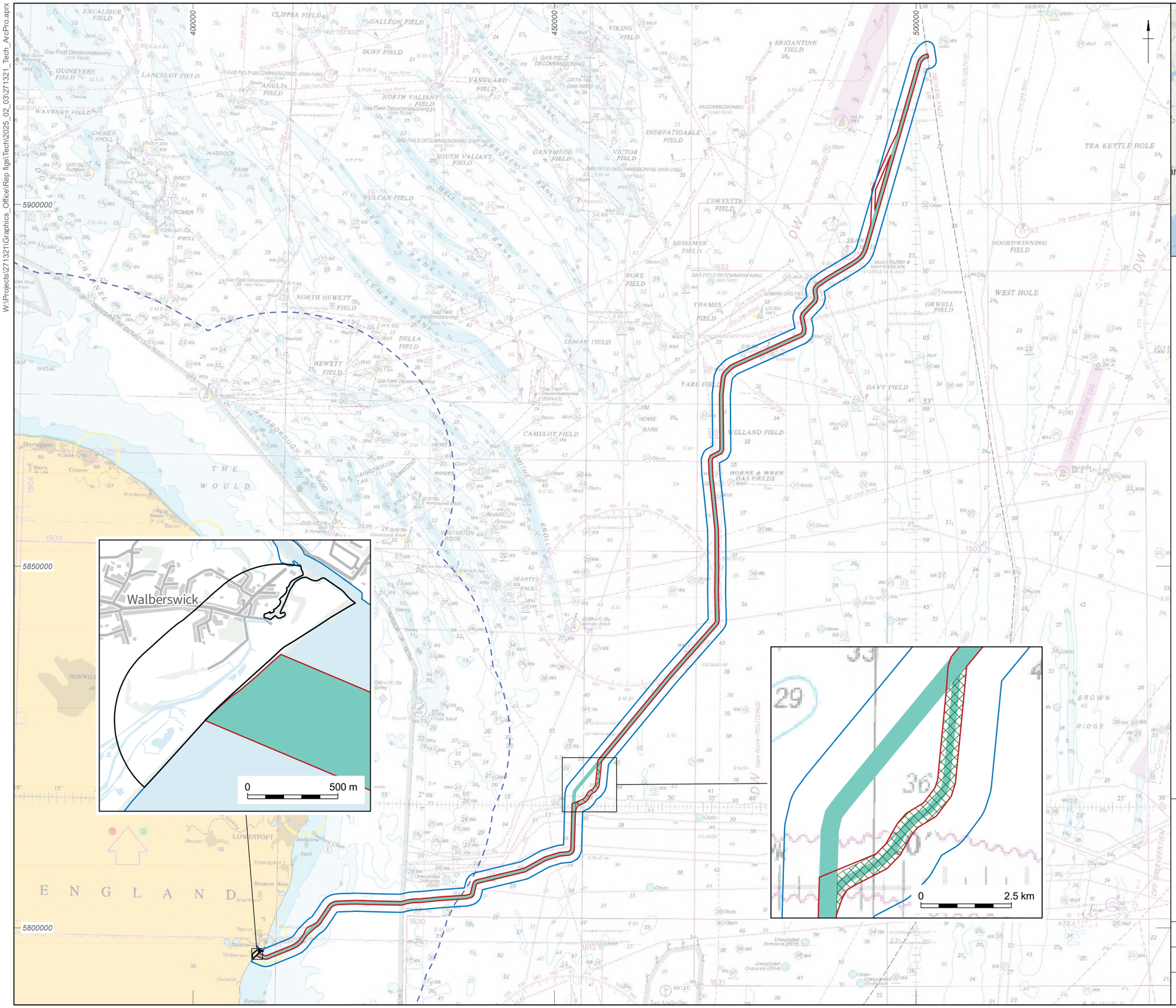

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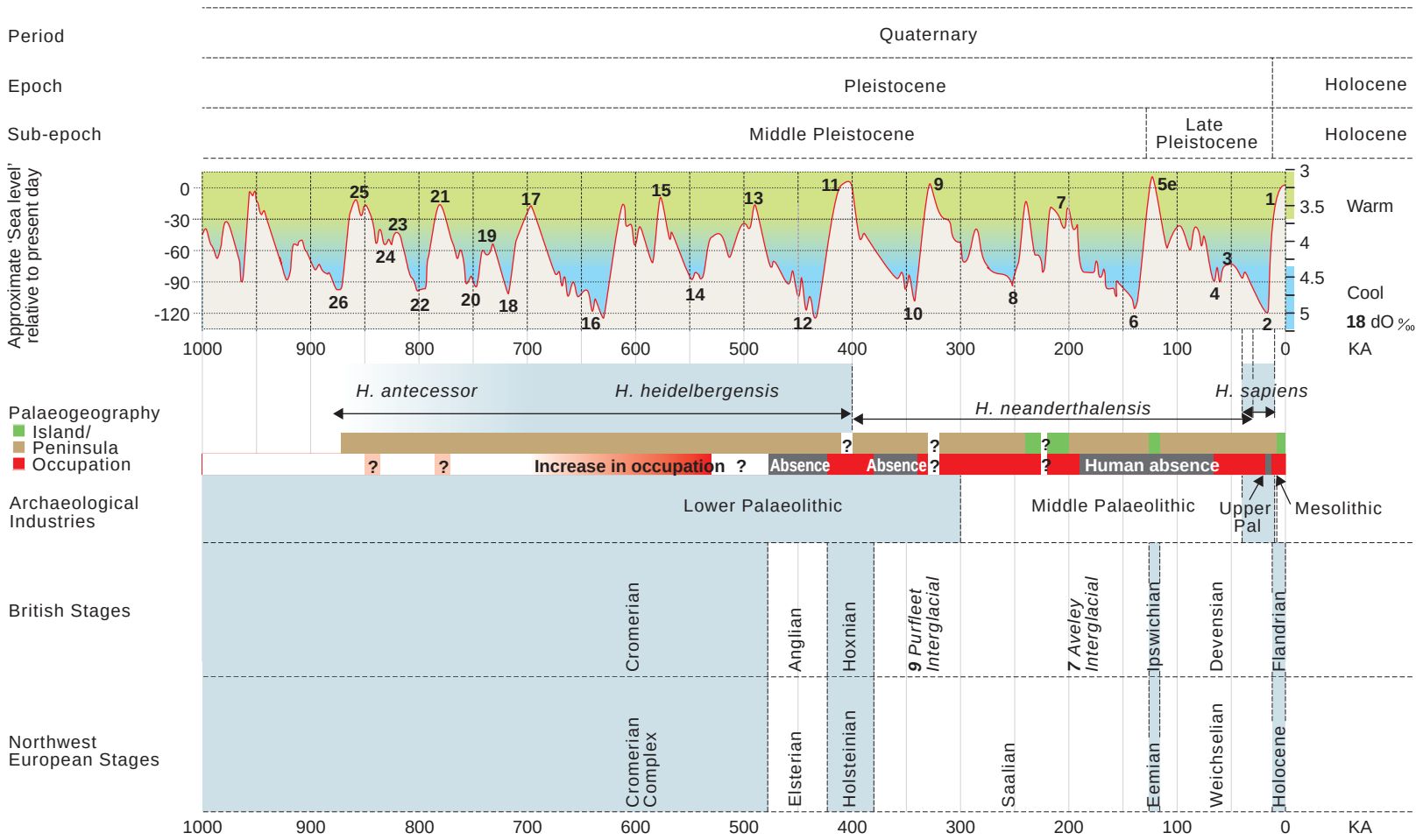
Figure 1: Location of LionLink and study area



The figure presents information derived from several references: the global sea-level curve is from Lisiecki and Raymo (2005) and Jelgersma (1979). Details on the geology and archaeology were provided by Dix and Westley (2004); Funnel (1995); Gibbard and van Kolfschoten (2004); Kukla et al. (2002); Lee et al. (2006); Lowe and Walker (1997) and Wymer (1999).

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Sea level curve and chronology of the Southern North Sea

Figure 2

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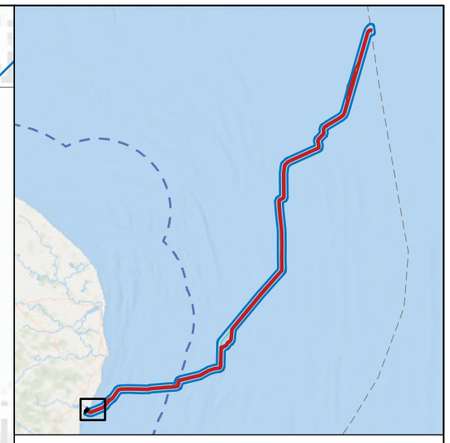
Fig. 7



Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
English Territorial Waters
Selected vibrocores mentioned in the report text and/or gazetteer
SBP data example locations

Palaeogeographic features of archaeological potential

Channel
Simple cut and fill
Fine grained deposit
Acoustic blanking

0
1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 3a: Palaeogeographic features of archaeological potential

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Fig 6
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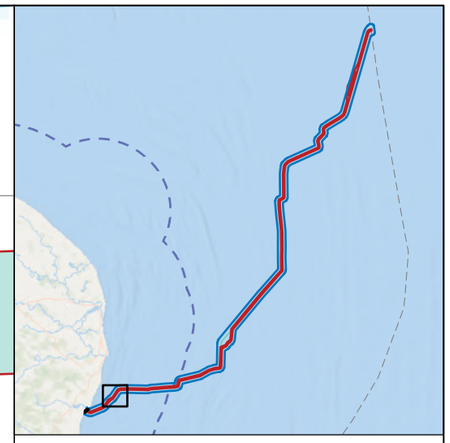

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
English Territorial Waters
Selected vibrocores mentioned in the report text and/or gazetteer
SBP data example locations

Palaeogeographic features of archaeological potential

Bank
Simple cut and fill
Fine grained deposit
High amplitude reflector
Acoustic blanking

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 3b: Palaeogeographic features of archaeological potential

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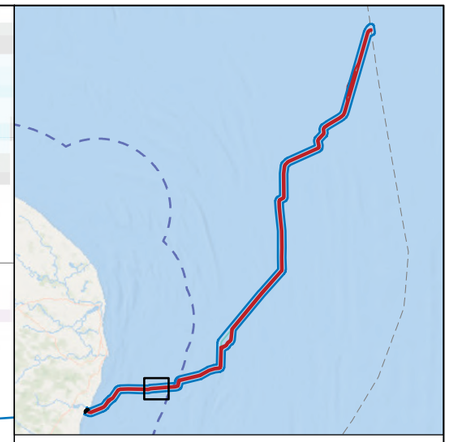
Fig. 5



Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
English Territorial Waters
SBP data example locations

Palaeogeographic features of archaeological potential

Channel

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 3c: Palaeogeographic features of archaeological potential

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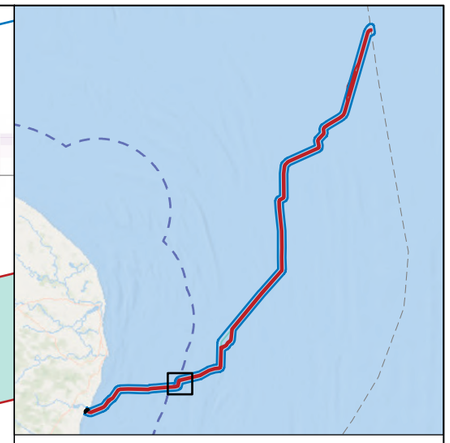

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
English Territorial Waters
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Channel
Bank
Simple cut and fill

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

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Figure 3d: Palaeogeographic features of archaeological potential

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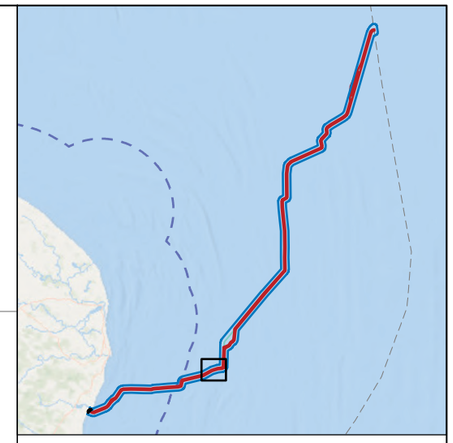

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Channel
Bank

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 3e: Palaeogeographic features of archaeological potential

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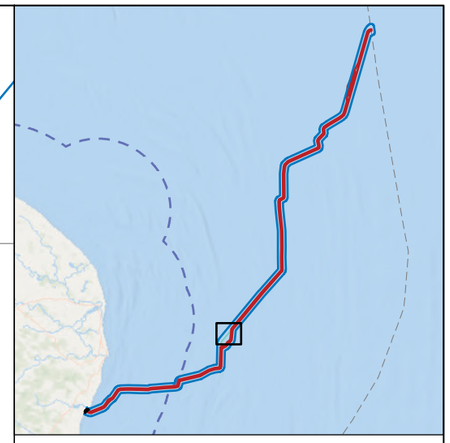

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Area without supplied SBP data
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Channel
Simple cut and fill

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
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Figure 3f: Palaeogeographic features of archaeological potential

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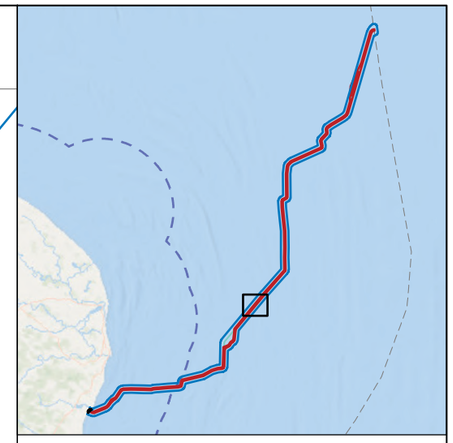
Fig 4



Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer
SBP data example locations

Palaeogeographic features of archaeological potential
Channel
Complex cut and fill
Simple cut and fill

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
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Figure 3g: Palaeogeographic features of archaeological potential

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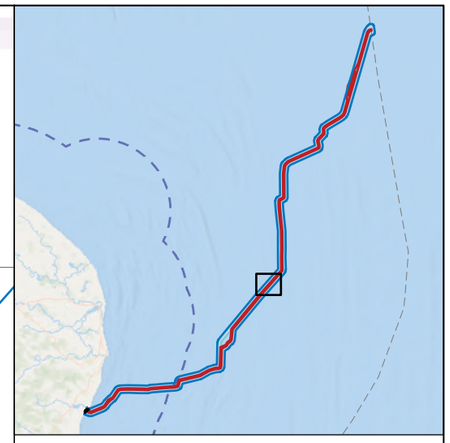

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Channel
Simple cut and fill

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 3h: Palaeogeographic features of archaeological potential

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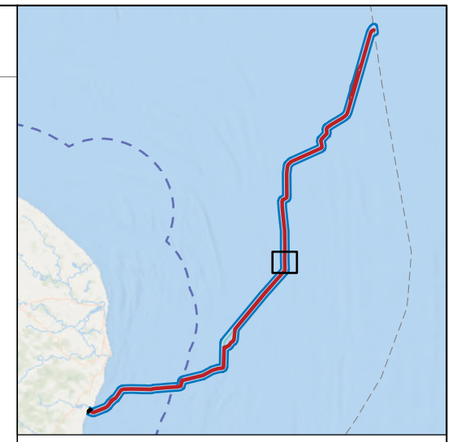

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Simple cut and fill
Acoustic blanking

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 3i: Palaeogeographic features of archaeological potential

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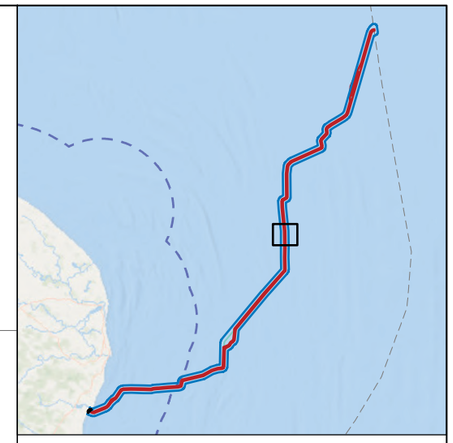

Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Simple cut and fill
High amplitude reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 3j: Palaeogeographic features of archaeological potential

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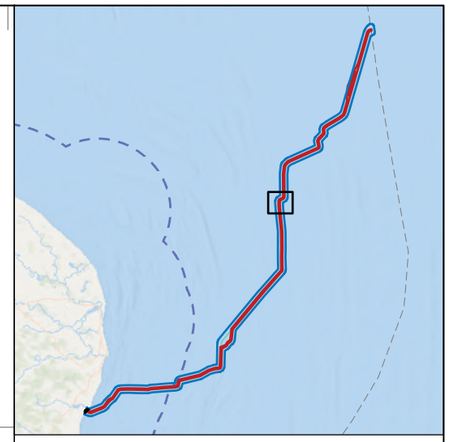

Marine archaeology study area

Proposed Offshore Scheme Draft Order Limits

Geophysical survey area

Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential

Channel

Fine grained deposit

High amplitude reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 3k: Palaeogeographic features of archaeological potential

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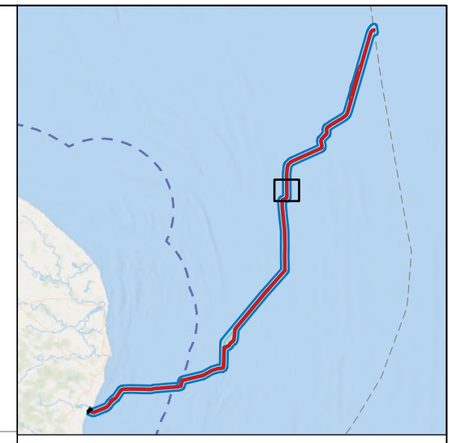


Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Channel
Simple cut and fill
High amplitude reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

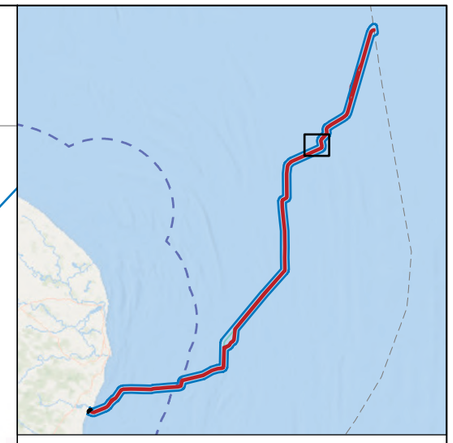
Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 3l: Palaeogeographic features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

480000
482000
484000
486000
5886000
5884000
5882000
5880000

75064
75063
75062
75061
VC_128
75060
75058
VC_127
75059



Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
Selected vibrocores mentioned in the report text and/or gazetteer

Palaeogeographic features of archaeological potential
Channel
Bank
Simple cut and fill
Erosion surface
High amplitude reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

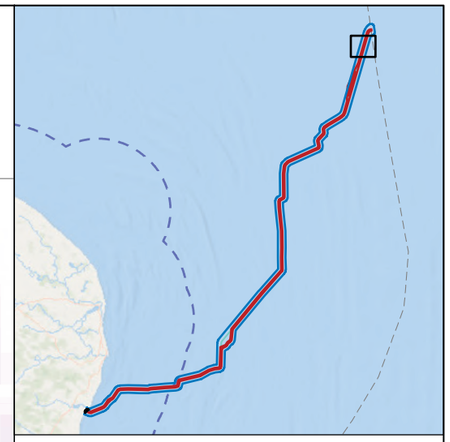
Scale: 1:25,000 at A3 | Revision: 1

Figure 3m: Palaeogeographic features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

496000
498000
500000
502000
5918000
5916000
5914000
5912000

75065



Marine archaeology study area
Proposed Offshore Scheme Draft Order Limits
Geophysical survey area
EEZ limit

Palaeogeographic features of archaeological potential

High amplitude reflector

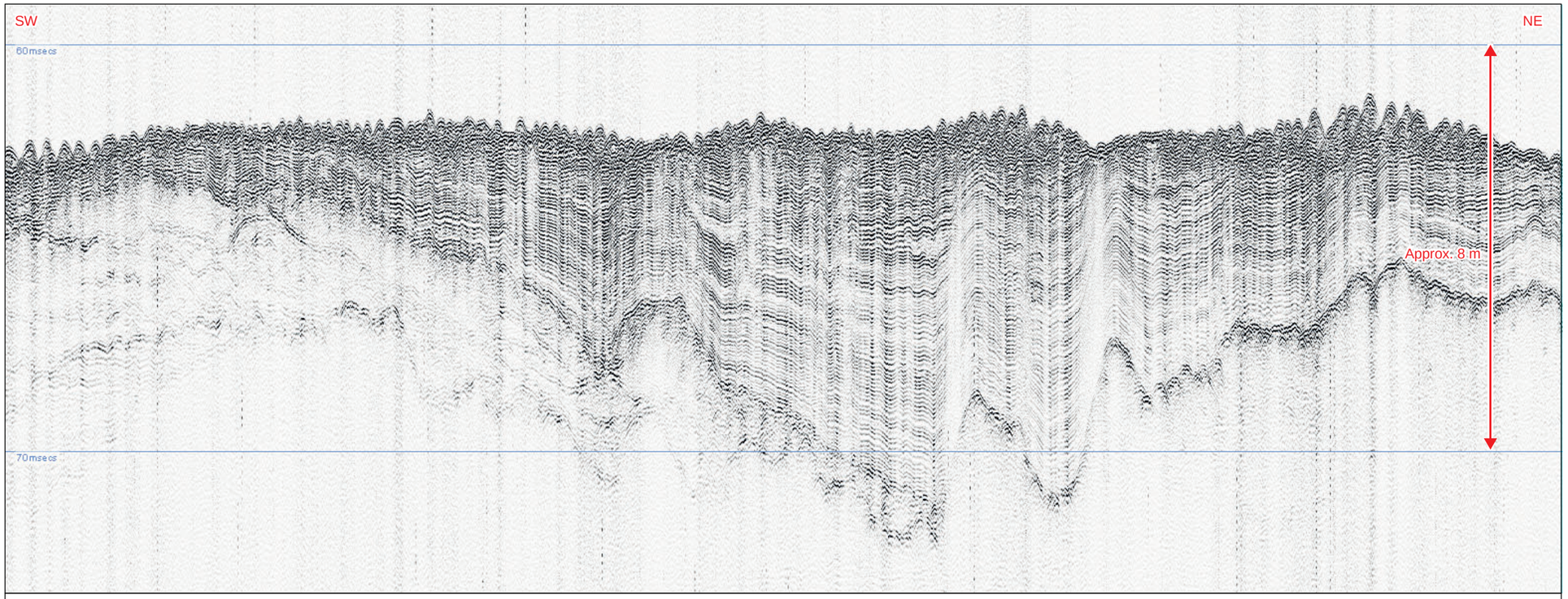
0 1 km

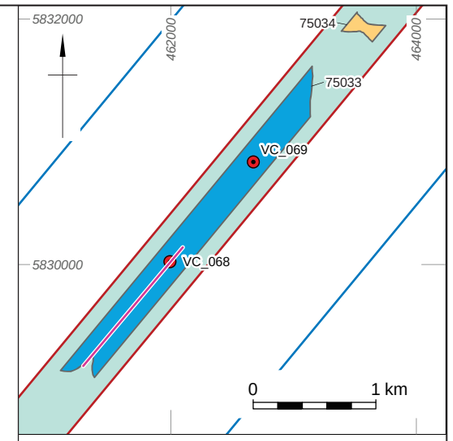
Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 3n: Palaeogeographic features of archaeological potential





- Proposed Offshore Scheme Draft Order Limits
- Marine archaeology study area
- Geophysical survey area
- Selected vibrocores mentioned in the report text and/or gazetteer
- SBP data example location

Palaeogeographic features of archaeological potential

- Channel
- Simple cut and fill

Coordinate system: ETRS 1989 UTM Zone 31N

Created by: KJF	Date: 23/07/2025	
Scale: 1:50,000 at A3	Revision: 1	

Figure 4. SBP data example – channel **75033**

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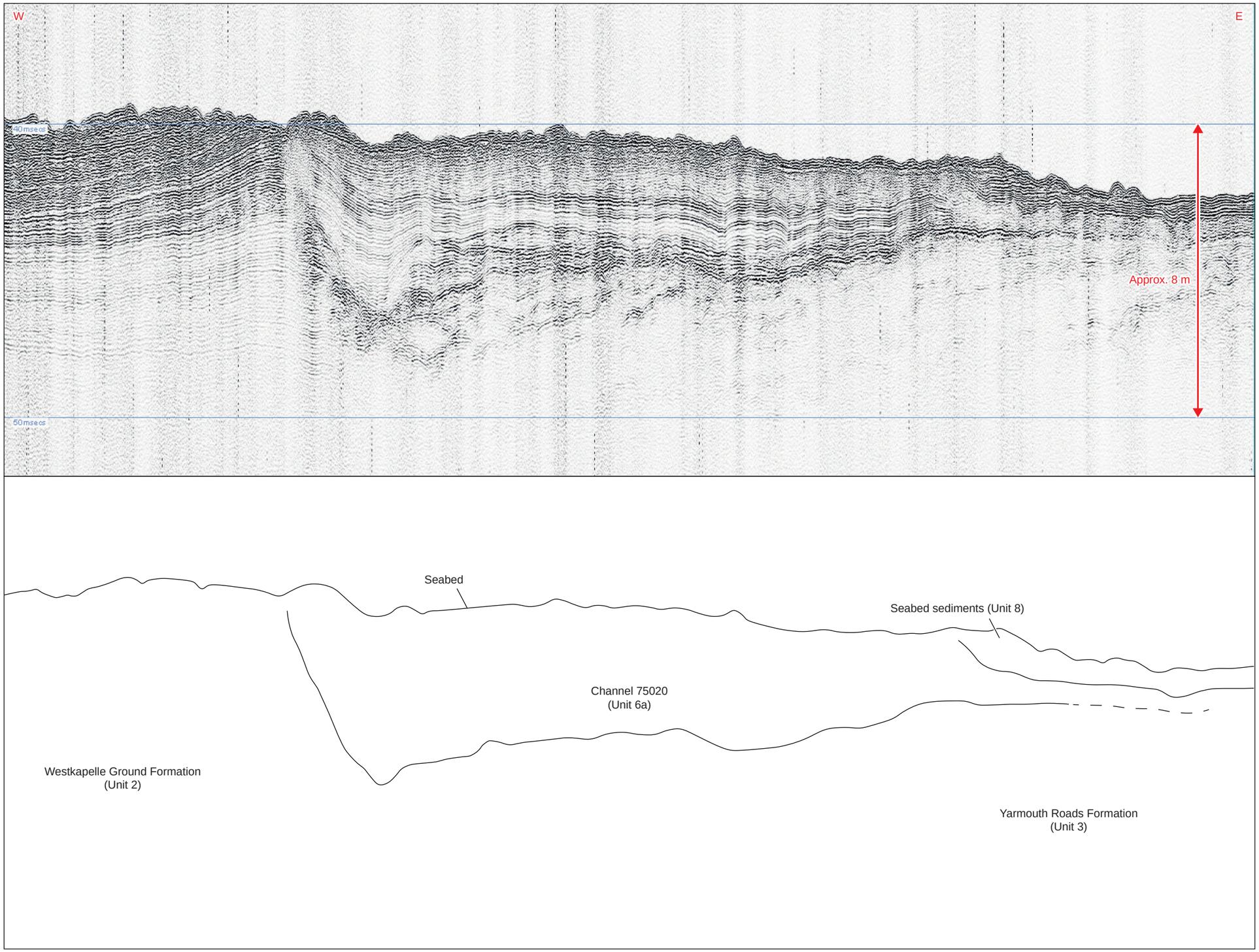

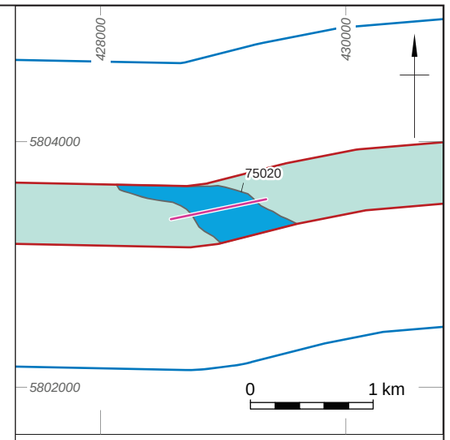

- Proposed Offshore Scheme Draft Order Limits
- Marine archaeology study area
- Geophysical survey area
- SBP data example location

Palaeogeographic features of archaeological potential

- Channel

Coordinate system: ETRS 1989 UTM Zone 31N

Created by: KJF	Date: 23/07/2025	
Scale: 1:50,000 at A3	Revision: 1	

Figure 5. SBP data example – channel **75020**

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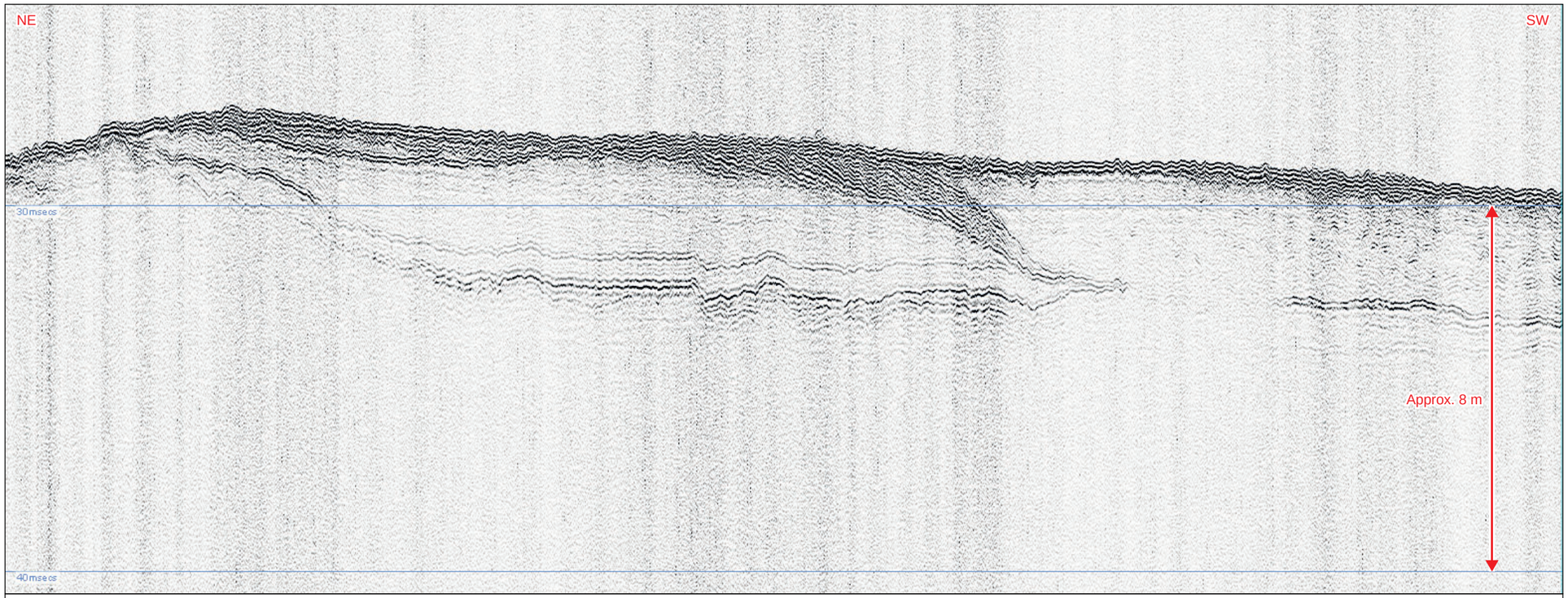

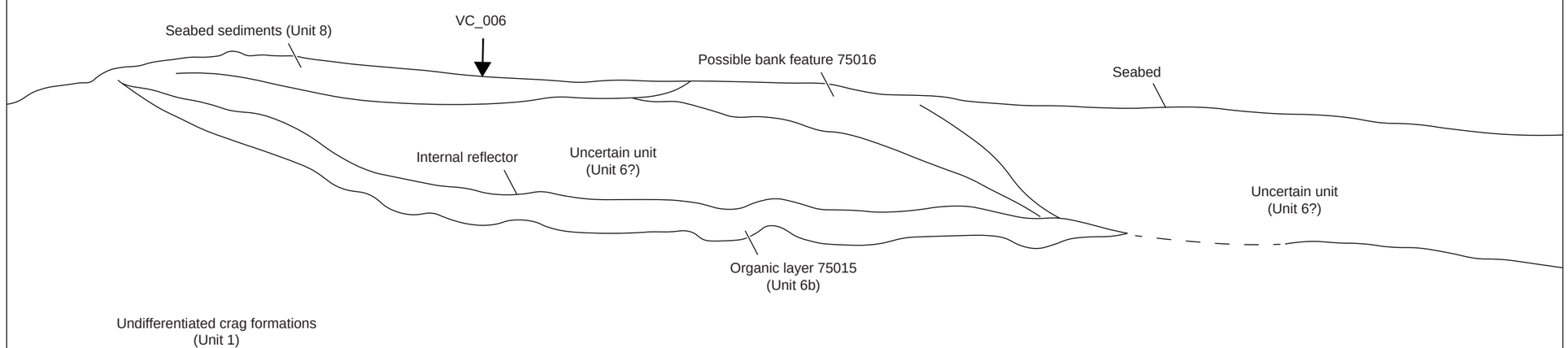

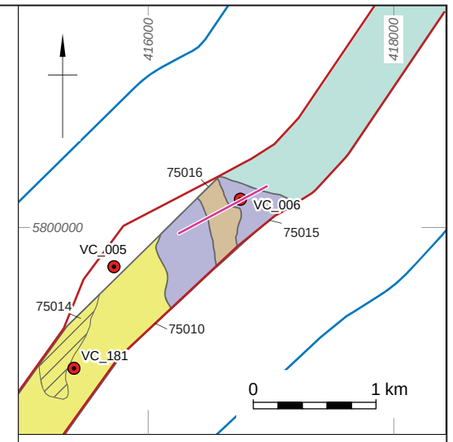

- Proposed Offshore Scheme Draft Order Limits
- Marine archaeology study area
- Geophysical survey area
- Selected vibrocores mentioned in the report text and/or gazetteer
- SBP data example location

Palaeogeographic features of archaeological potential

- Bank
- Fine grained deposit
- High amplitude reflector
- Acoustic blanking

Coordinate system: ETRS 1989 UTM Zone 31N

Created by: KJF	Date: 23/07/2025
Scale: 1:50,000 at A3	Revision: 1

Figure 6. SBP data example – features **75015** and **75016**

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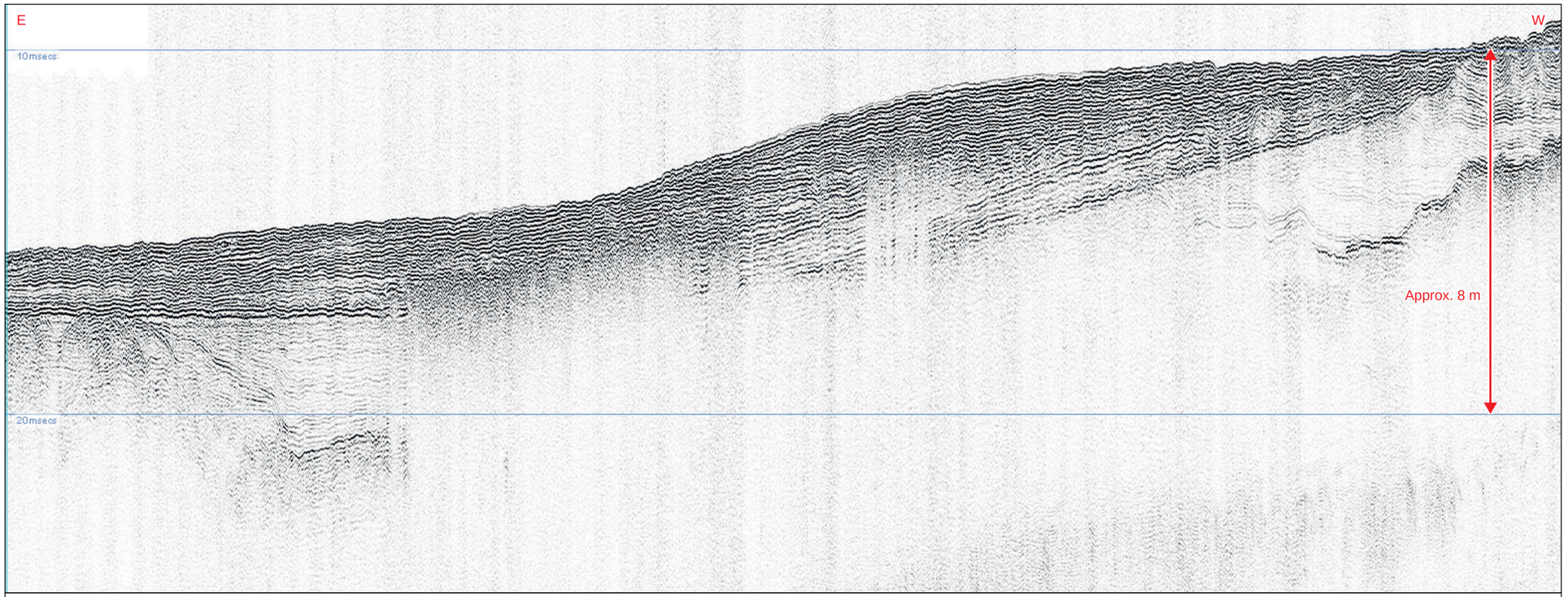
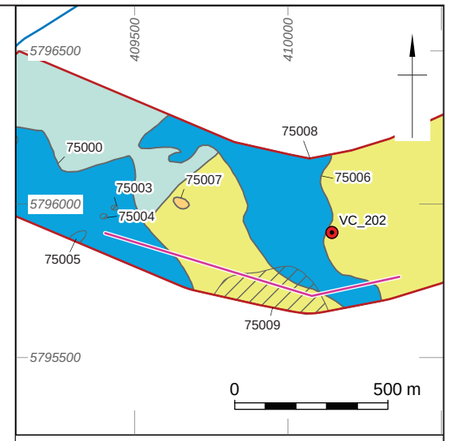




- Proposed Offshore Scheme Draft Order Limits
- Marine archaeology study area
- Geophysical survey area
- Selected vibrocores mentioned in the report text and/or gazetteer
- SBP data example location

Palaeogeographic features of archaeological potential

- Channel
- Simple cut and fill
- Fine grained deposit
- Acoustic blanking

Coordinate system: ETRS 1989 UTM Zone 31N

Created by: KJF	Date: 23/07/2025	
Scale: 1:20,000 at A3	Revision: 0	

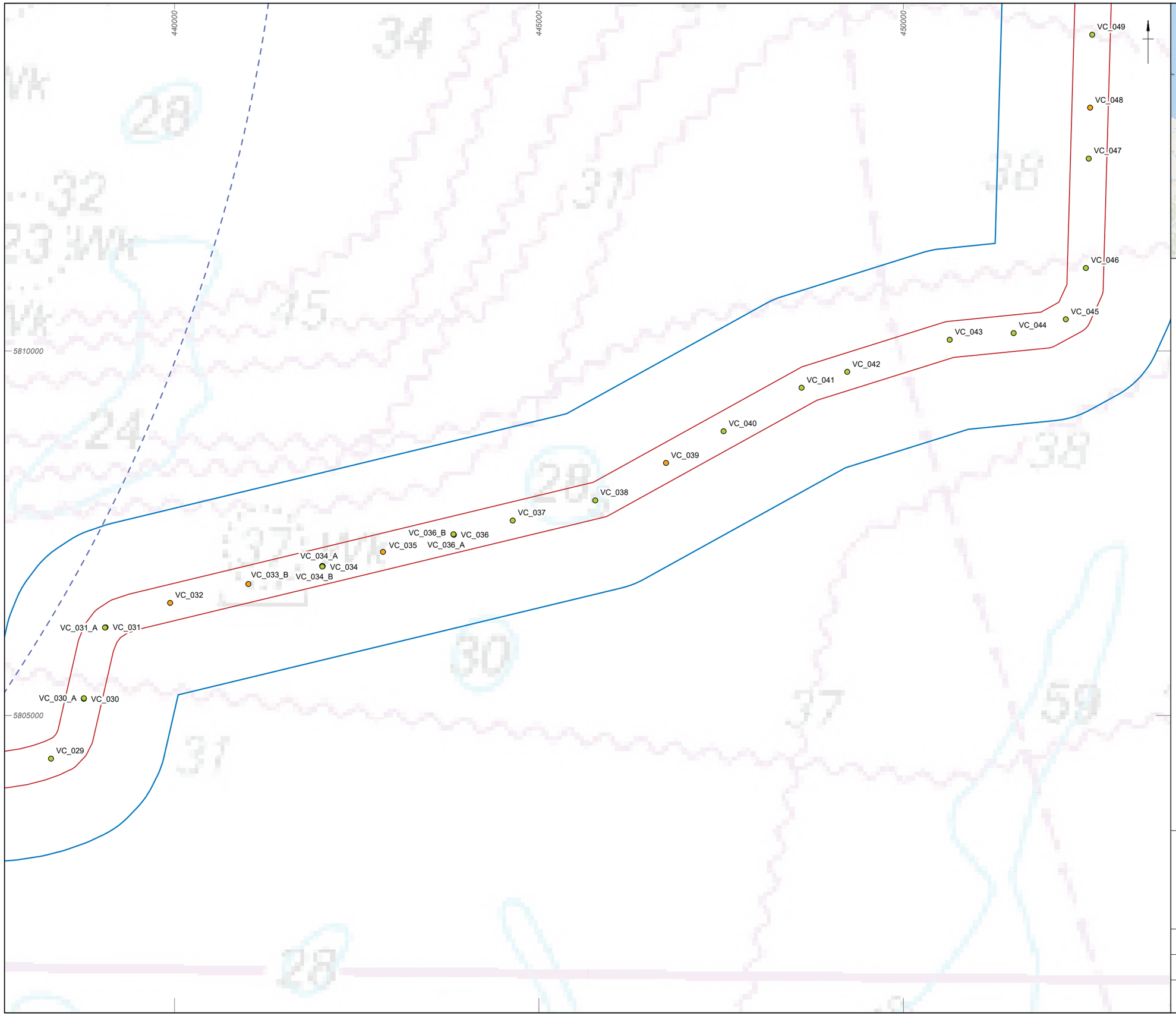
Figure 7. SBP data example – features **75000**, **75006**, **75008**, and **75009**

410000
415000
420000
5805000
5800000
5795000
Benacre Ness
VC_010
VC_011
VC_012
VC_013
VC_009_A
VC_009
VC_008
VC_007
VC_006
VC_005
VC_004
VC_003
VC_181
VC_201
VC_002
VC_002_A
VC_001_A
VC_001
VC_180
VC_179
VC_178
VC_177
VC_202
Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit
Vibrocore priority
High
Medium
0
2.5 km
Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025
Created by: AW/KJF
Scale: 1:50,000 at A3
Revision: 1
Figure 8a: Geoarchaeological priority of geotechnical vibrocores

425000
430000
435000
5805000
5800000
VC_014
VC_015
VC_016
VC_017
VC_017_A
VC_018_A
VC_018
VC_019
VC_020
VC_021
VC_022
VC_022_A
VC_023
VC_024
VC_025
VC_026
VC_027
VC_027_A
VC_028
VC_029
Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit
Vibrocore priority
Medium
Low
0
2.5 km
Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025
Created by: AW/KJF
Scale: 1:50,000 at A3
Revision: 1
Figure 8b: Geoarchaeological priority of geotechnical vibrocores

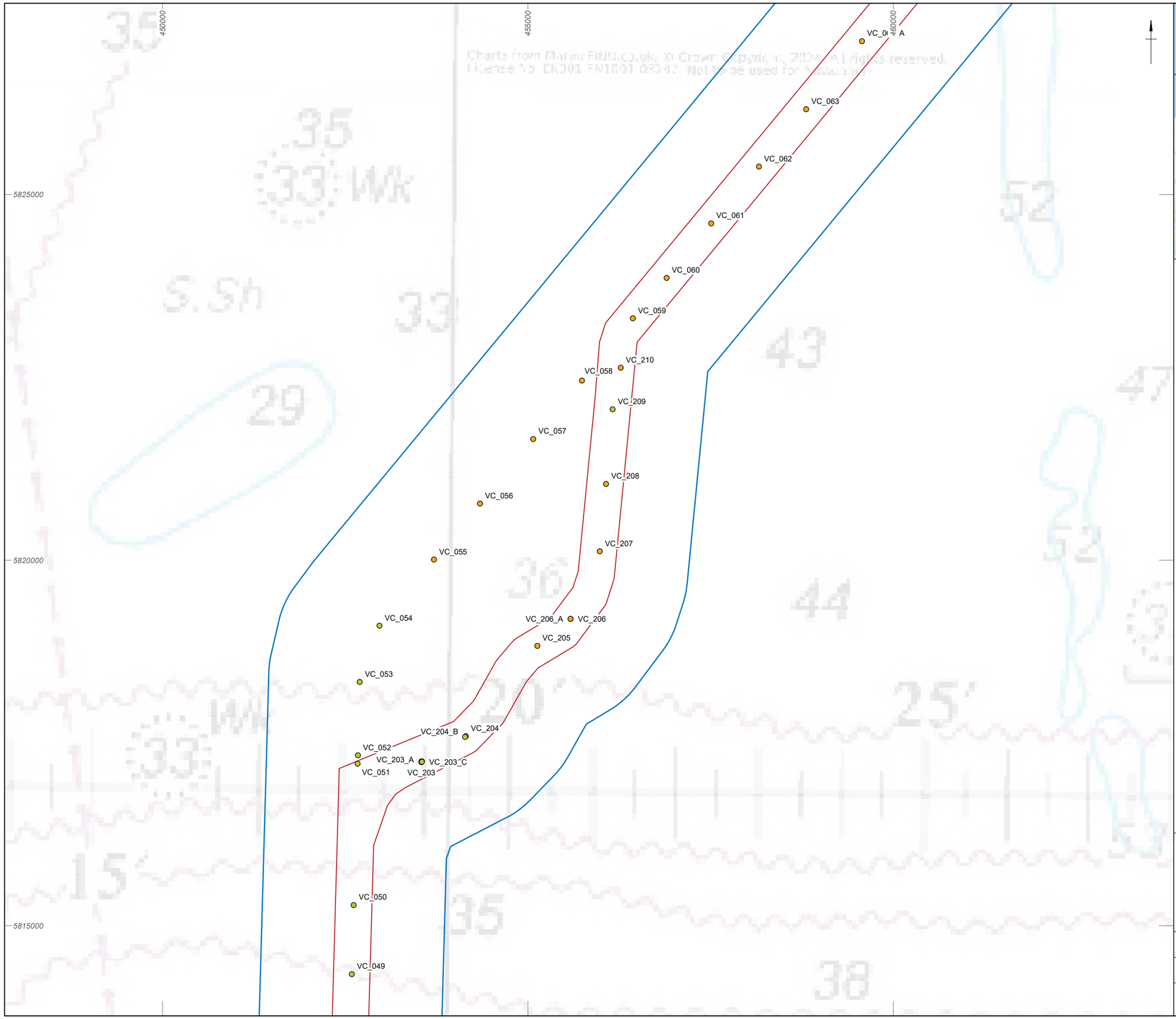


Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: AW/KJF

Scale: 1:50,000 at A3 | Revision: 1

Figure 8c: Geoarchaeological priority of geotechnical vibrocores

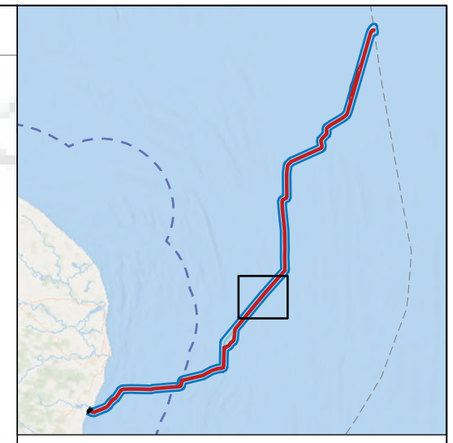


Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025	Created by: AW/KJF	
Scale: 1:50,000 at A3	Revision: 1	

Figure 8d: Geoarchaeological priority of geotechnical vibrocores

460000
465000
470000
5840000
5835000
5830000
VC_081
VC_080
VC_079
VC_078
VC_077
VC_076
VC_075
VC_074
VC_073
VC_072
VC_071
VC_070_A
VC_069
VC_068
VC_067
VC_066
VC_065
VC_064_A



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit
Vibrocore priority
Medium
Low

0
2.5 km

Coordinate system: ETRS 1989 UTM Zone 31N

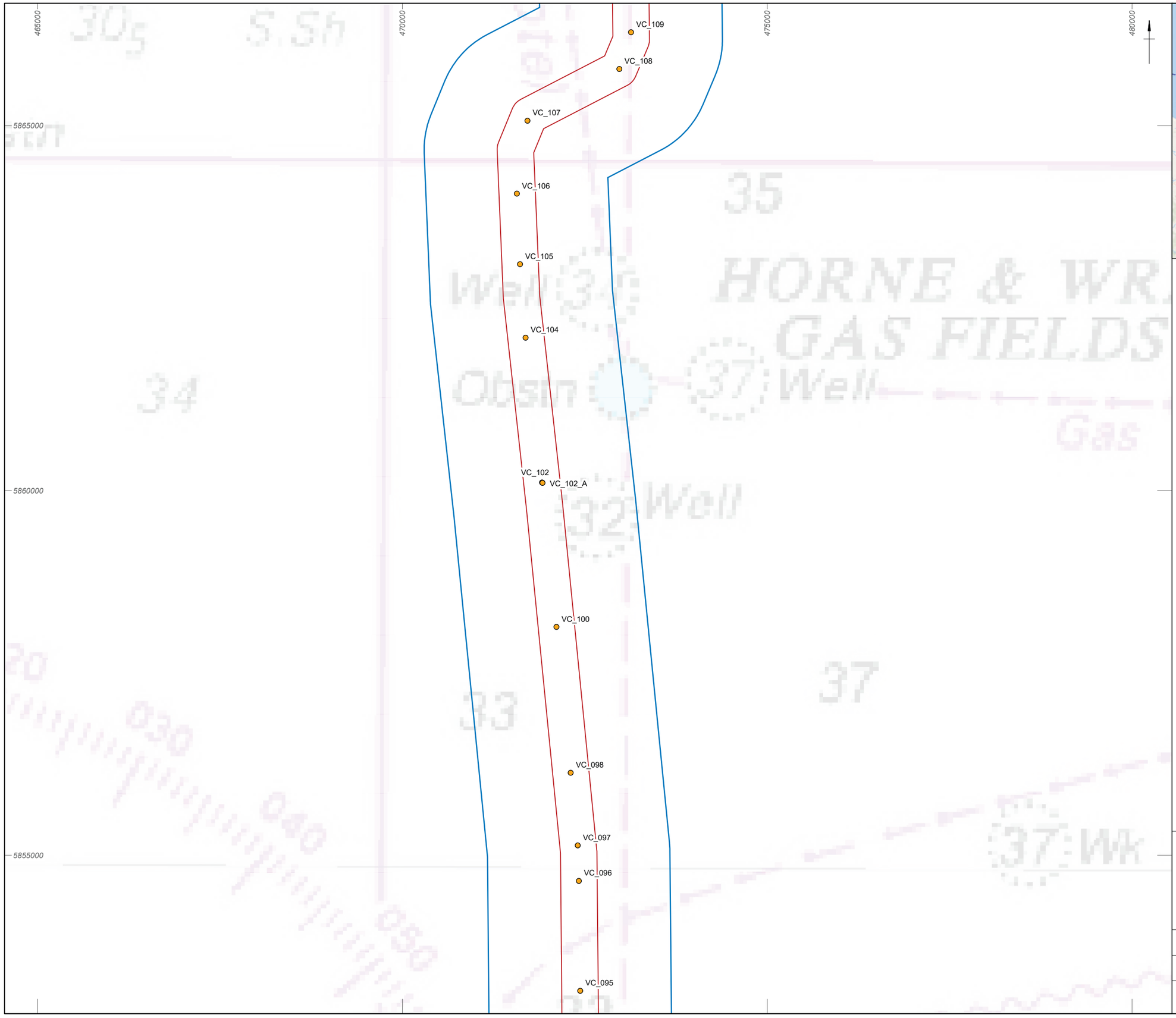
Date: 21/07/2025 | Created by: AW/KJF

Scale: 1:50,000 at A3 | Revision: 1

Figure 8e: Geoarchaeological priority of geotechnical vibrocores

465000
470000
475000
5850000
5845000
5840000
VC_095
VC_094_A
VC_093
VC_092
VC_091
VC_090
VC_089
VC_088
VC_087
VC_086
VC_085
VC_084
VC_083
VC_082
VC_081
Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit
Vibrocore priority
Medium
Low
0
2.5 km
Coordinate system: ETRS 1989 UTM Zone 31N

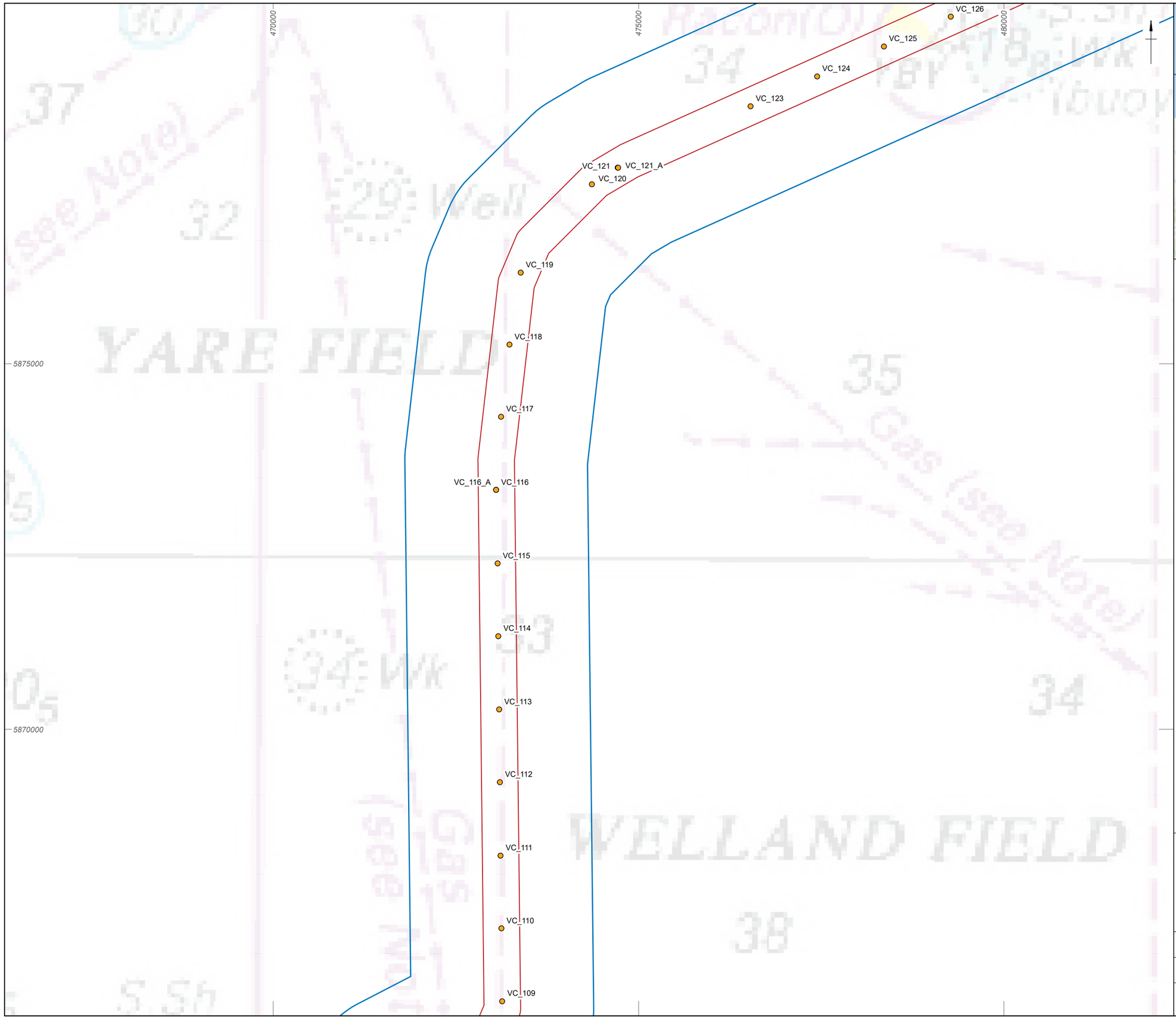
Date: 21/07/2025
Created by: AW/KJF
Scale: 1:50,000 at A3
Revision: 1
Figure 8f: Geoarchaeological priority of geotechnical vibrocores



Date: 21/07/2025 | Created by: AW/KJF

Scale: 1:50,000 at A3 | Revision: 1

Figure 8g: Geoarchaeological priority of geotechnical vibrocores



Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: AW/KJF

Scale: 1:50,000 at A3 | Revision: 1

Figure 8h: Geoarchaeological priority of geotechnical vibrocores

480000
485000
490000
5890000
5885000
5880000

VC_147
VC_146
VC_145
VC_144
VC_143
VC_142
VC_139
VC_140
VC_141
VC_138
VC_137
VC_136
VC_135
VC_134
VC_133
VC_132
VC_131
VC_130
VC_129
VC_128
VC_127
VC_126

GAWAIN GAS FIELD

Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit

Vibrocore priority
- High
- Medium
- Low

0 2.5 km

Coordinate system: ETRS 1989 UTM Zone 31N

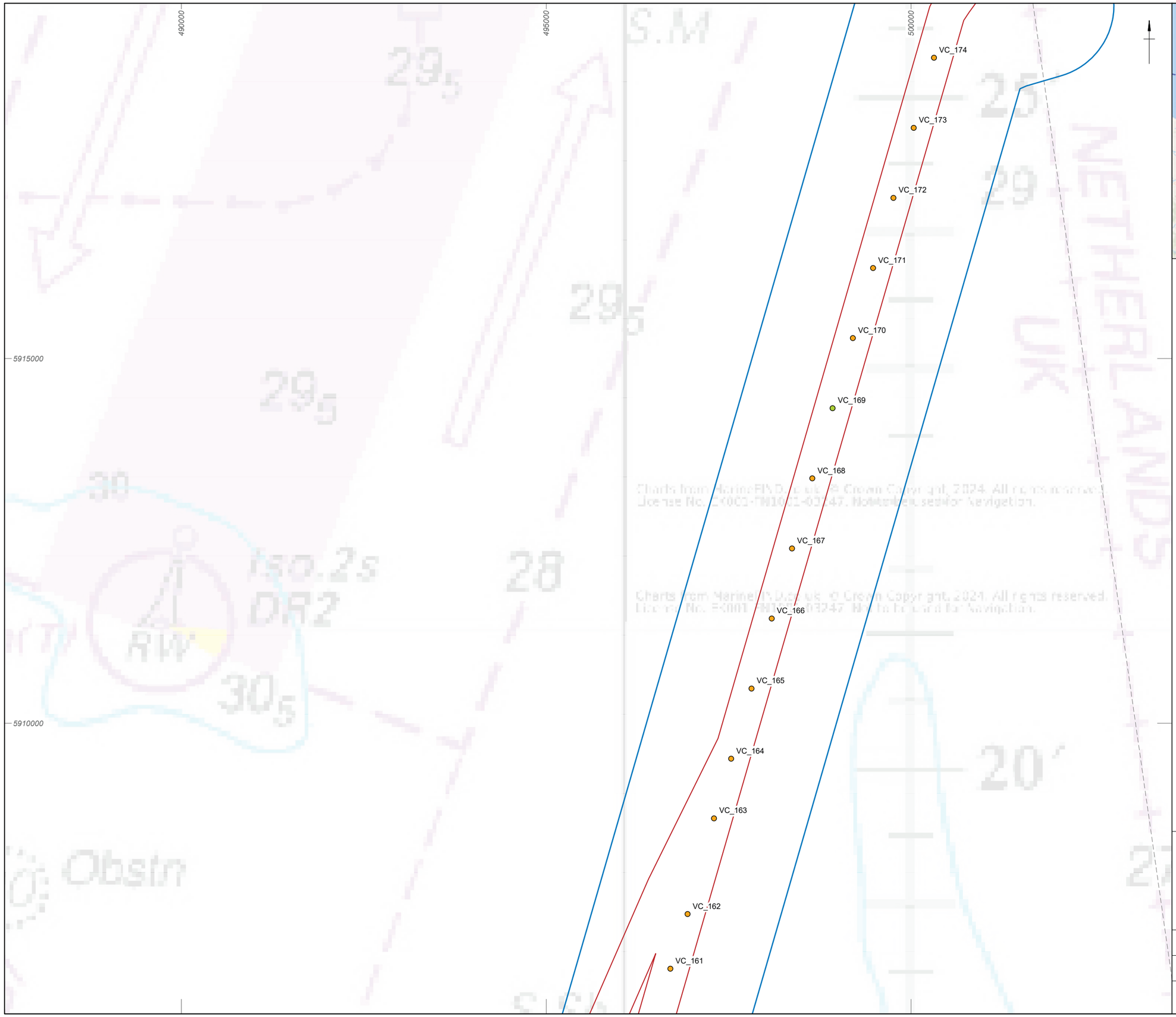
Date: 21/07/2025 | Created by: AW/KJF

Scale: 1:50,000 at A3 | Revision: 1

Figure 8i: Geoarchaeological priority of geotechnical vibrocores

490000
495000
500000
5905000
5900000
5895000
VC_161
VC_160
VC_159
VC_158
VC_157
VC_156
VC_155
VC_154
VC_153
VC_152
VC_151
VC_150
VC_149
VC_148
VC_147
Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit
Vibrocore priority
Medium
Low
0
2.5 km
Coordinate system: ETRS 1989 UTM Zone 31N

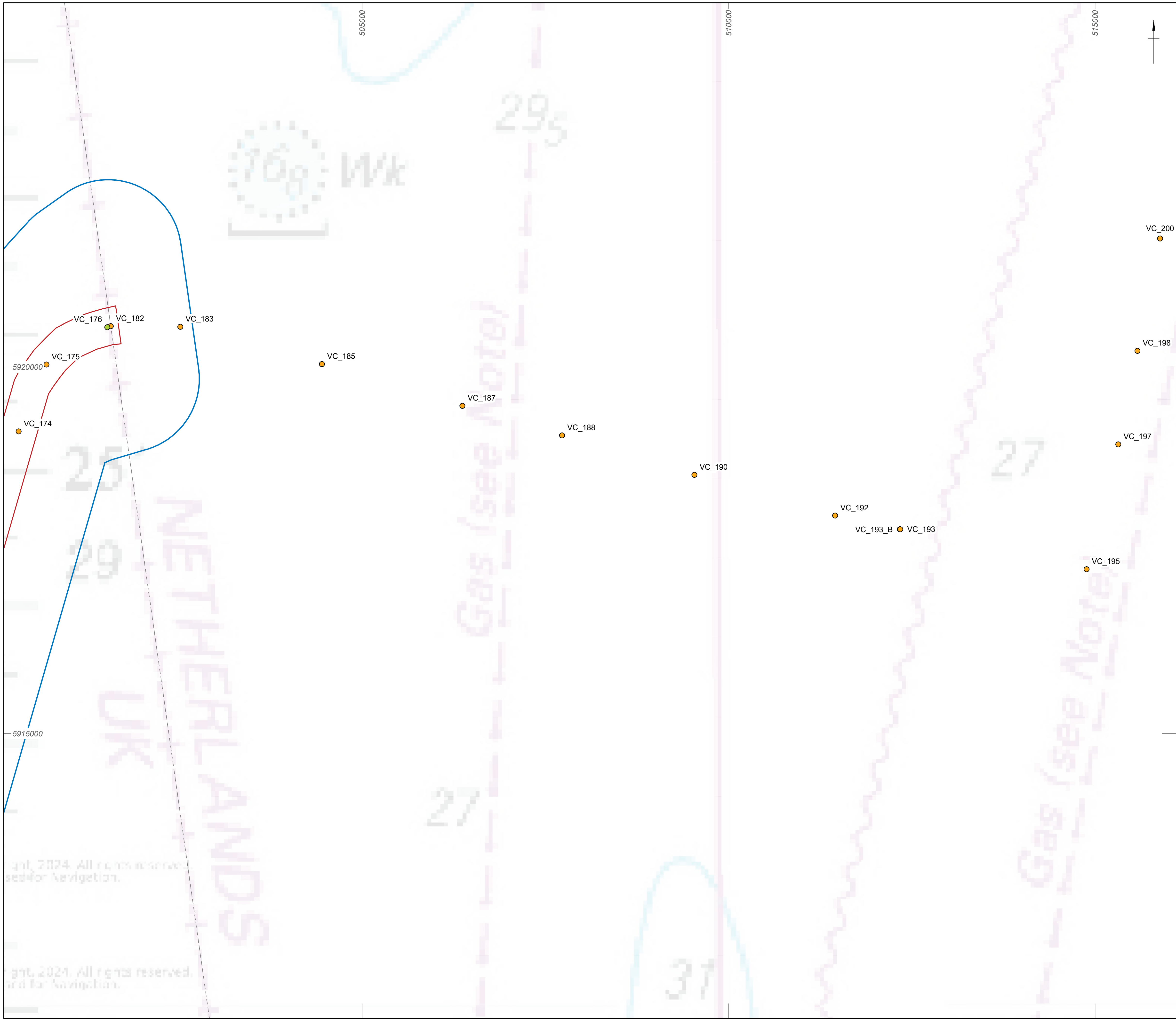
Date: 21/07/2025
Created by: AW/KJF
Scale: 1:50,000 at A3
Revision: 1
Figure 8j: Geoarchaeological priority of geotechnical vibrocores

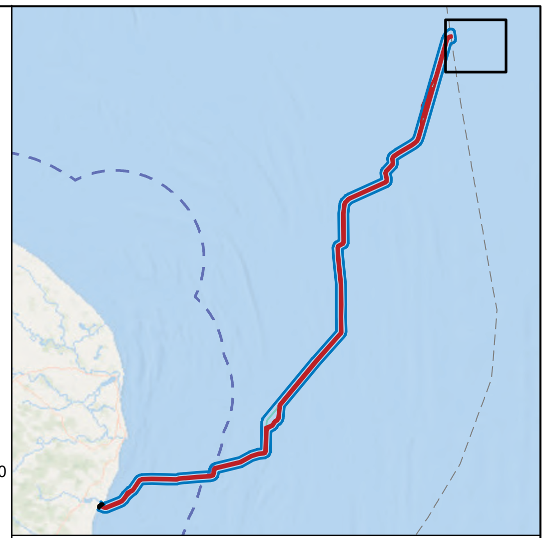


Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025	Created by: AW/KJF	
Scale: 1:50,000 at A3	Revision: 1	

Figure 8k: Geoarchaeological priority of geotechnical vibrocores





Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
English Territorial Waters
EEZ limit
Vibrocore priority
Medium
Low

0 2.5 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025	Created by: AW/KJF
Scale: 1:50,000 at A3	Revision: 1

Figure 8l: Geoarchaeological priority of geotechnical vibrocores

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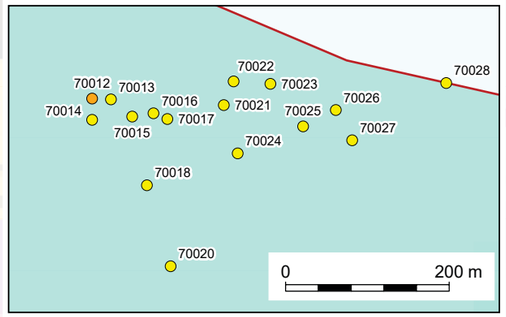
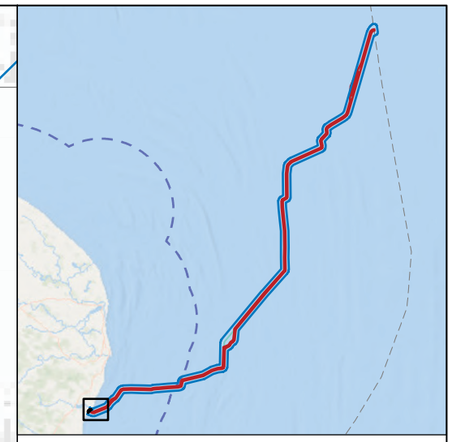
408000 410000 412000 414000

5800000 5798000 5796000 5794000





2006 2003 2001 2002 2004 2005

70074 70072 70073 70071 70069 70070 70068 70065 70066 70064 70067 70063 70061 70062 70058 70055 70053 70057 70059 70054 70056 70060 70051 70052 70049 70050 70046 70043 70045 70042 70047 70048 70044 70040 70041 70035 70038 70036 70039 70037 70033 70032 70034 70029 70031 70030 70001 70006 70004 70007 70010 70000 70005 70009 70003 70008 70012 70002 70011 70016 70014 70015 70018 70020 70019 70022 70023 70028 70025 70027 70024

Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_h - Anomaly of likely anthropogenic origin but of unknown date
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Linear seabed features

Dark reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 23/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 9a: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

416000 418000 420000

5804000 5802000 5800000 5798000

2012 2011 2009 2010 2006

70114 70113 70112 70117 70124 70123 70118 70121 70122 70119 70120 70115 70116 70111 70106 70109 70110 70105

0 200 m

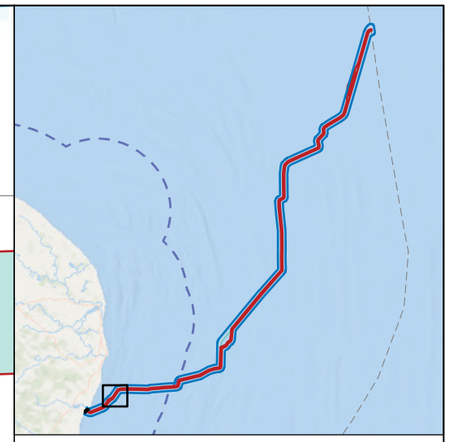
70098 70097

0 100 m

70090

0 100 m

70162 70164 70163 70160 70156 70157 70161 70154 70155 70159 70158 70153 70150 70152 70149 70151 70145 70148 70147 70144 70141 70146 70140 70142 70143 70139 70137 70138 70135 70136 70130 70132 70134 70131 70133 70128 70129 70125 70126 70127 70114 70117 70124 70118 70123 70113 70112 70120 70122 70107 70108 70119 70121 70116 70115 70106 70109 70111 70104 70110 70105 70098 70099 70101 70103 70097 70100 70102 70095 70096 70094 70093 70092 70091 70088 70089 70090 70086 70085 70087 70084 70083 70078 70080 70082 70081 70077 70079 70076 70075 70074 70072 70073



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_h - Anomaly of likely anthropogenic origin but of unknown date
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
A3 - Historic record of possible archaeological interest with no corresponding geophysical anomaly
Recommended Archaeological Exclusion Zones (AEZs) 100 m

Seabed feature boundary extents

Dark reflector

Linear seabed features

Linear debris

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 23/07/2025 | Created by: KJF

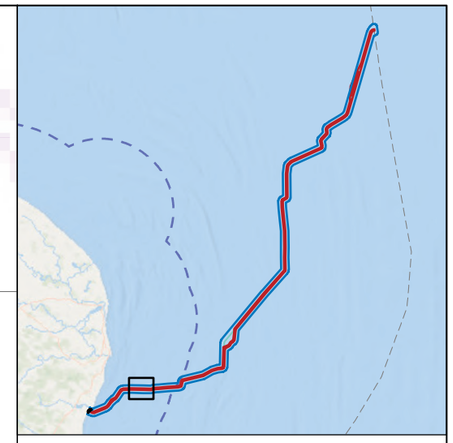
Scale: 1:25,000 at A3 | Revision: 1

Figure 9b: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

422000
424000
426000
428000
5806000
5804000
5802000

2013
2014
2015
2016
2017
2018
2019
70165
70166
70167
70168



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Seabed feature boundary extents

Seabed disturbance

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

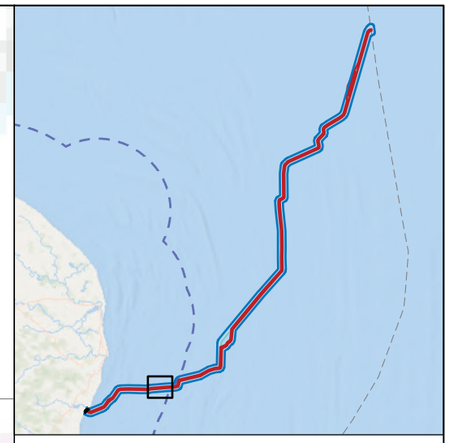
Scale: 1:25,000 at A3 | Revision: 1

Figure 9c: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

430000
432000
434000
436000
5806000
5804000
5802000

2024
2023
2020
2021
70168
70169
70170
70171
70172
70173
70174
70175



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_h - Anomaly of likely anthropogenic origin but of unknown date
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
A3 - Historic record of possible archaeological interest with no corresponding geophysical anomaly

Seabed feature boundary extents

Mound

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

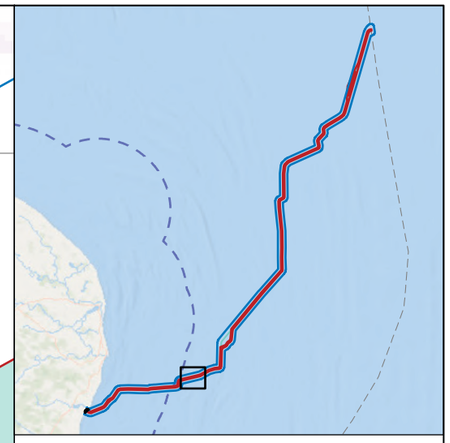
Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 9d: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

440000
442000
444000
446000
5810000
5808000
5806000
5804000

70179
2025
70177
70176
70178



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Seabed feature boundary extents

Seabed disturbance

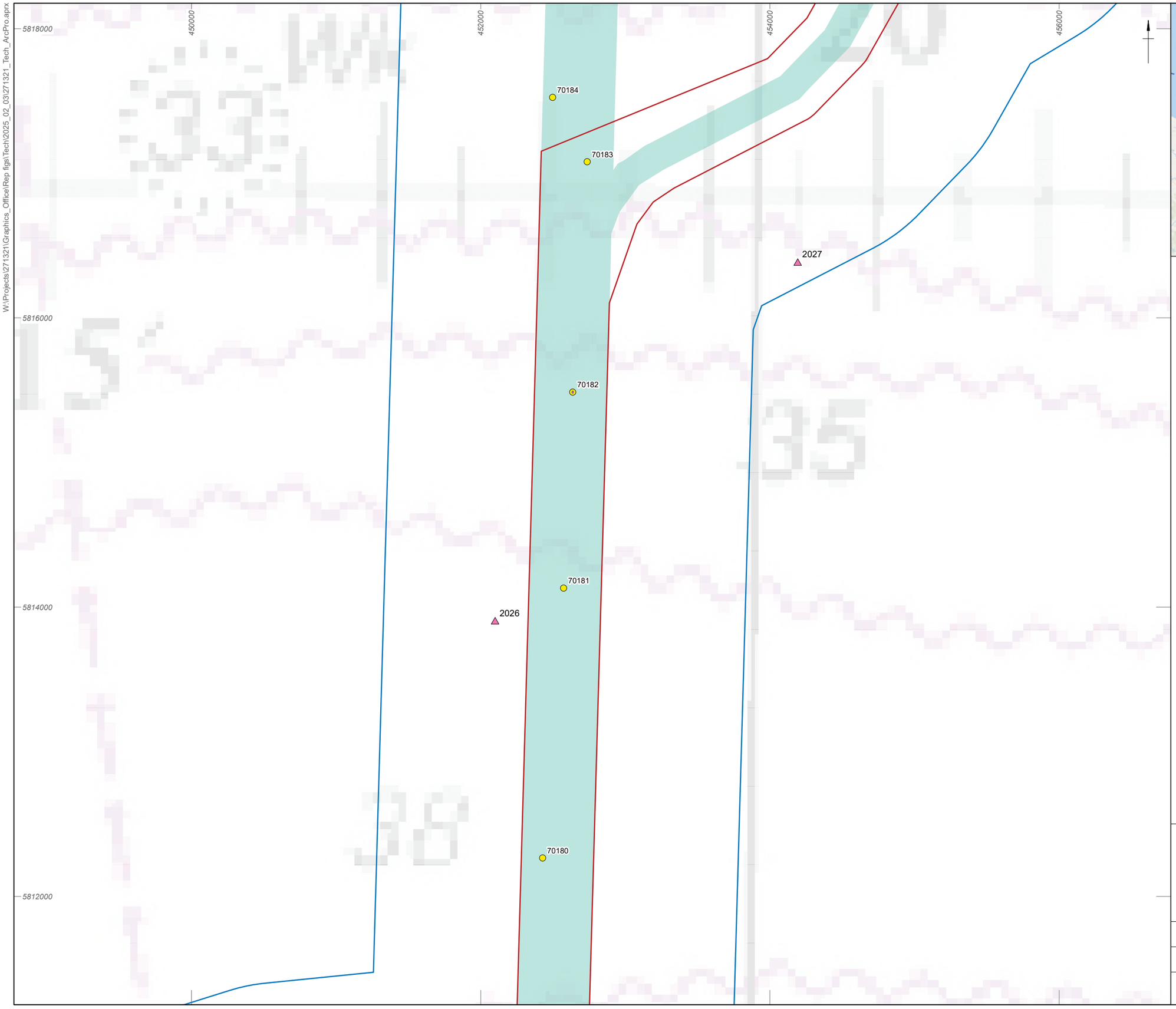
0 1 km

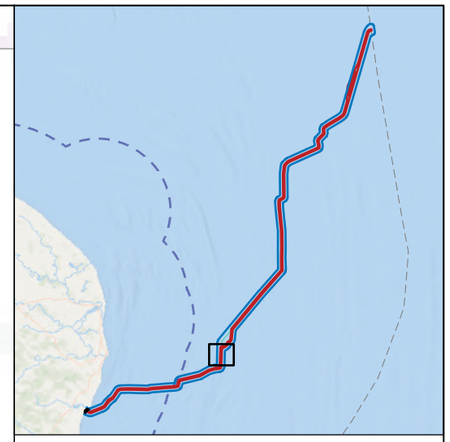
Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025	Created by: KJF
Scale: 1:25,000 at A3	Revision: 1

Figure 9e: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx





Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Seabed feature boundary extents

Mound

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

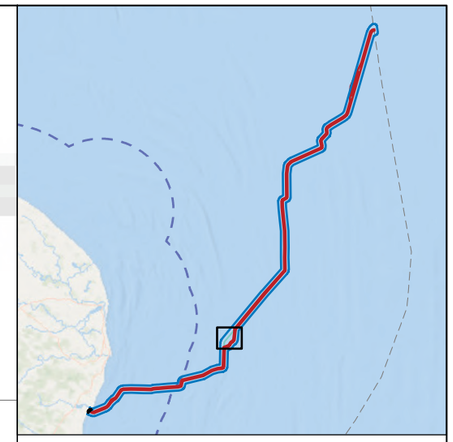
Date: 21/07/2025	Created by: KJF
Scale: 1:25,000 at A3	Revision: 1

Figure 9f: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

452000
454000
456000
458000
5822000
5820000
5818000

70188
70187
70185
70186
70184
70183



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Anomalies of archaeological potential
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
Linear seabed features
Magnetic trend

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 9g: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

460000
462000
464000
5832000
5830000
5828000

70206
70205
70204
70203
70202
70201
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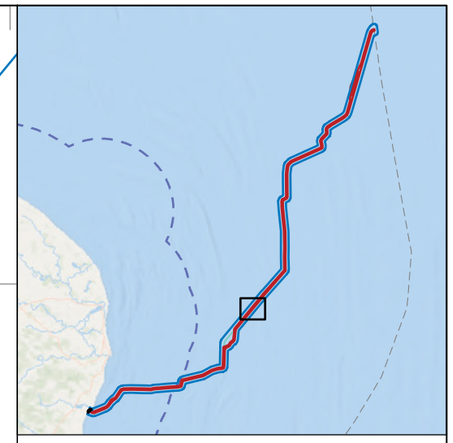
70195
70194
70193
70189
70191
70190
70192



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Linear seabed features

Dark reflector
Magnitic trend

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

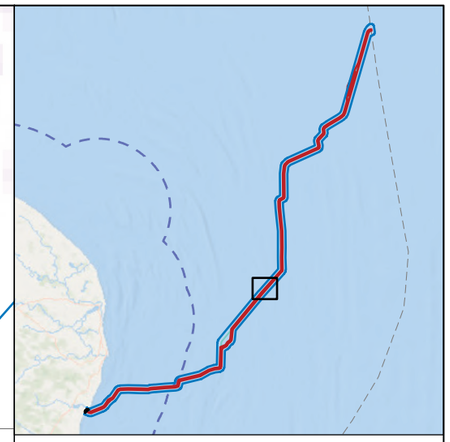
Date: 21/07/2025	Created by: KJF
Scale: 1:25,000 at A3	Revision: 1

Figure 9h: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

464000
466000
468000
470000
5838000
5836000
5834000

2031
2030
2029
2028
70213
70210
70212
70211
70209
70208
70207
70206



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions
Anomalies of archaeological potential
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
Seabed feature boundary extents
Seabed disturbance

0
1 km

Coordinate system: ETRS 1989 UTM Zone 31N

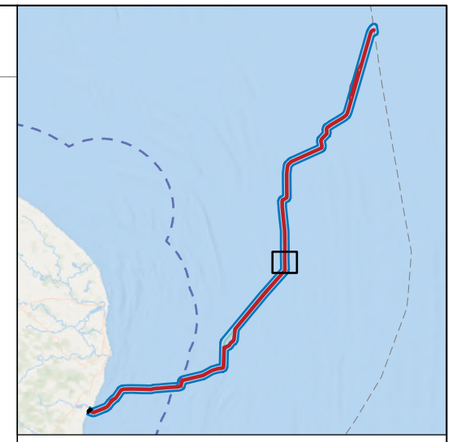
Date: 21/07/2025	Created by: KJF
Scale: 1:25,000 at A3	Revision: 1

Figure 9i: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

470000
472000
474000
476000
5848000
5846000
5844000
5842000

70227
70226
70224
70225
70222
70221
70223
70220
70219
70218
70217
70216
70215
70214



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Anomalies of archaeological potential
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
Seabed feature boundary extents
Seabed disturbance
Mound

0
1 km

Coordinate system: ETRS 1989 UTM Zone 31N

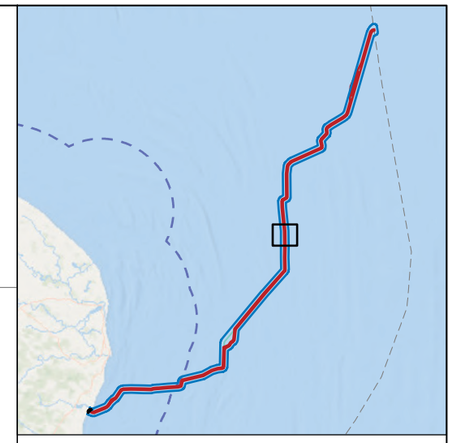
Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 9j: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

470000
472000
474000
476000
5856000
5854000
5852000

2032
70228



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions
Anomalies of archaeological potential
A2_I - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 9k: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

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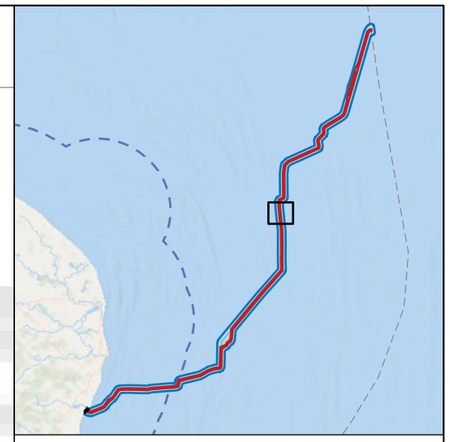
472000
474000
5864000
5862000
5860000
5858000

2033
2034
2035
70230
70231
70229



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_h - Anomaly of likely anthropogenic origin but of unknown date
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Seabed feature boundary extents

Mound

Linear seabed features

Linear debris

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 9l: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

470000
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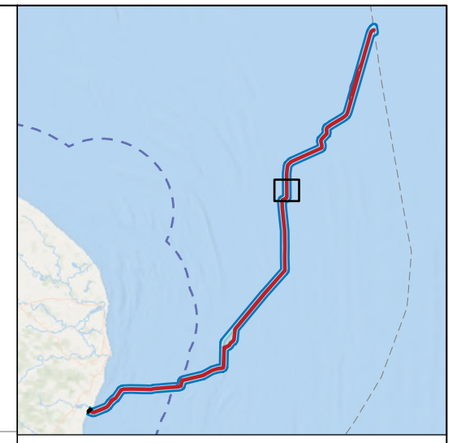
474000
476000
5870000
5868000
5866000

70234
70233
70232



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Anomalies of archaeological potential
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
Seabed feature boundary extents
Seabed disturbance

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 9m: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

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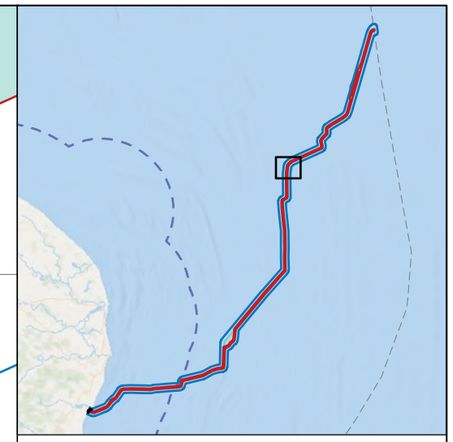
474000
476000
5878000
5876000
5874000

2036
2037
70238
70237
70236
70235



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions
Anomalies of archaeological potential
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
Seabed feature boundary extents
Mound

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025	Created by: KJF
Scale: 1:25,000 at A3	Revision: 1

Figure 9n: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

5886000
5884000
5882000
5880000
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484000
486000

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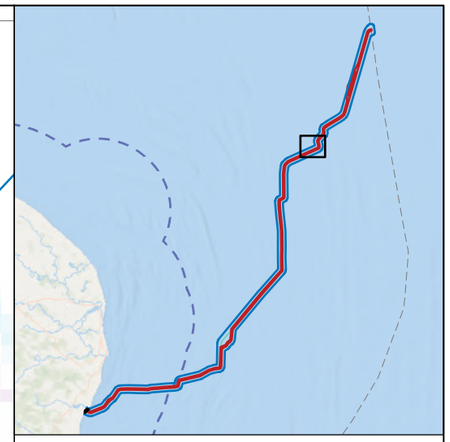
70242
70241
70240
70239
2038



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_h - Anomaly of likely anthropogenic origin but of unknown date
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 9o: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

486000
488000
490000
492000
5892000
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70258
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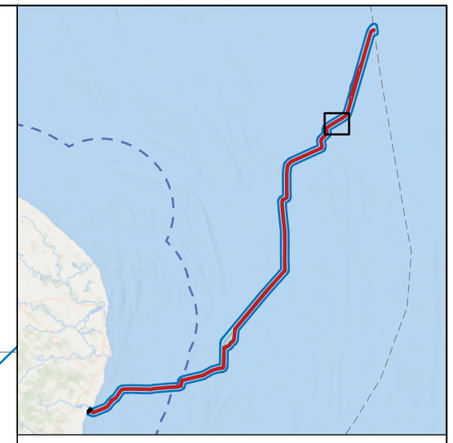
70256
70255
70253
70254
70252
70251
70250
70249
70248
2039



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Charted Wrecks and Obstructions

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

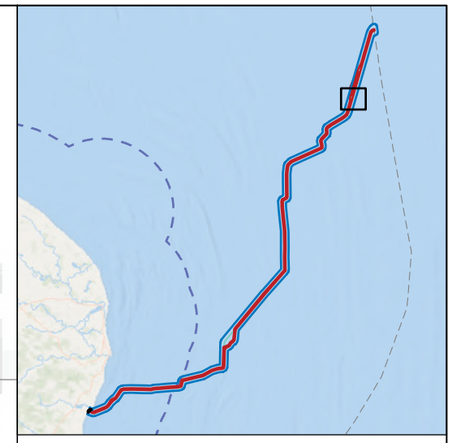
Scale: 1:25,000 at A3 | Revision: 1

Figure 9p: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

492000
494000
496000
498000
5900000
5898000
5896000

70269
70268
70267
70266
70265
70264
70263
70262
70261
70260
70259



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Seabed feature boundary extents

Seabed disturbance

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

Figure 9q: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

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496000
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5902000

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70277
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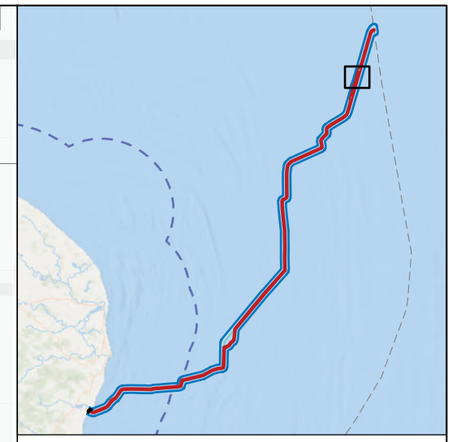
70276
70274
70275
70273
70272
70271
70270



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Linear seabed features

Dark reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025	Created by: KJF
Scale: 1:25,000 at A3	Revision: 1

Figure 9r: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

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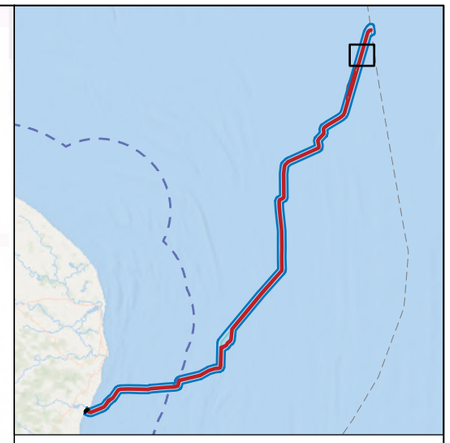
500000
502000
5914000
5912000
5910000

70284
70283
70282
70281
70280



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit
Anomalies of archaeological potential
A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain
Seabed feature boundary extents
Dark reflector

0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 21/07/2025 | Created by: KJF
Scale: 1:25,000 at A3 | Revision: 1

Figure 9s: Seabed features of archaeological potential

W:\Projects\271321\Graphics_Office\Rep figs\Tech\2025_02_03\271321_Tech_ArcPro.aprx

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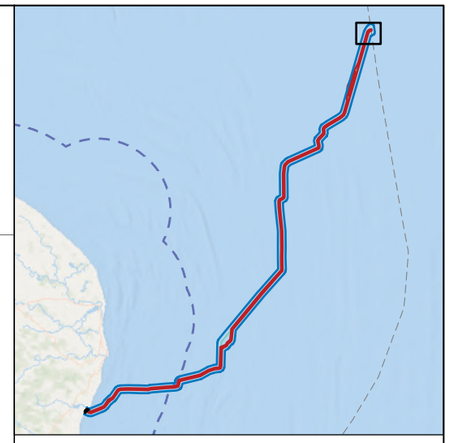
500000
502000
504000
5922000
5920000
5918000

70288
70287
70286
70285



Proposed Offshore Scheme Draft Order Limits
Marine archaeology study area
Geophysical survey area
English Territorial Waters
EEZ limit

Anomalies of archaeological potential

A2_l - Anomaly of possible anthropogenic origin but the intrepretation is uncertain

Linear seabed features

Dark reflector

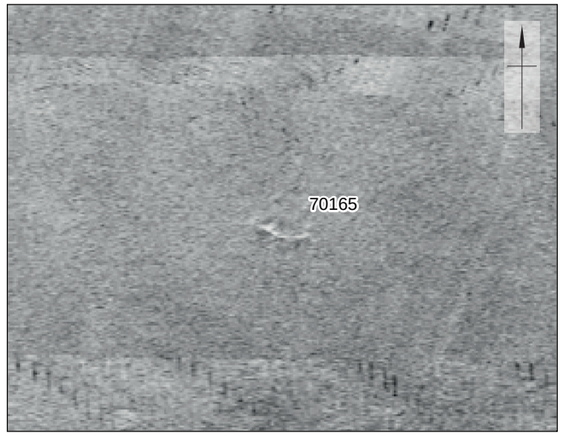
0 1 km

Coordinate system: ETRS 1989 UTM Zone 31N

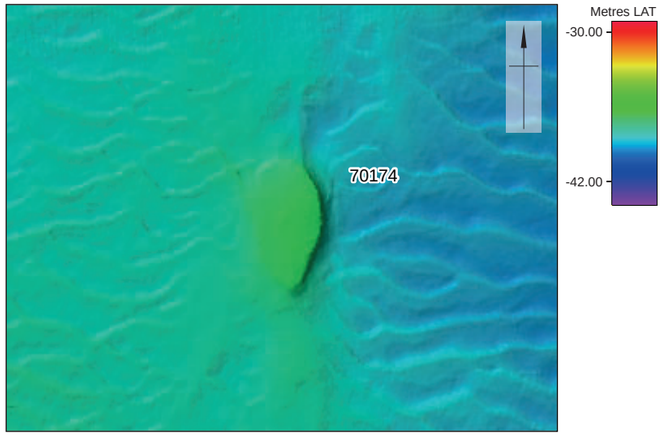
Date: 23/07/2025 | Created by: KJF

Scale: 1:25,000 at A3 | Revision: 1

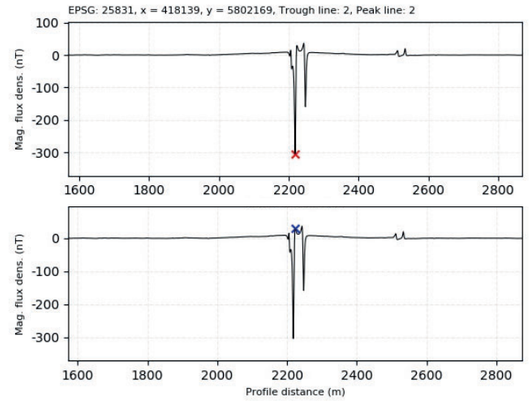
Figure 9t: Seabed features of archaeological potential



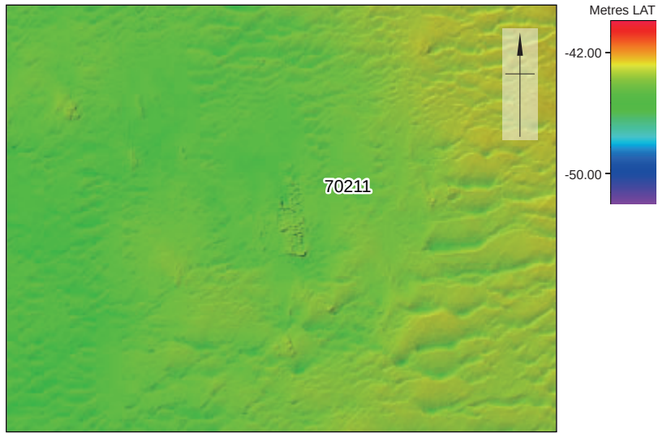
SSS mosaic image showing bright reflector anomaly **70165**, measuring 6.9 x 0.7 m



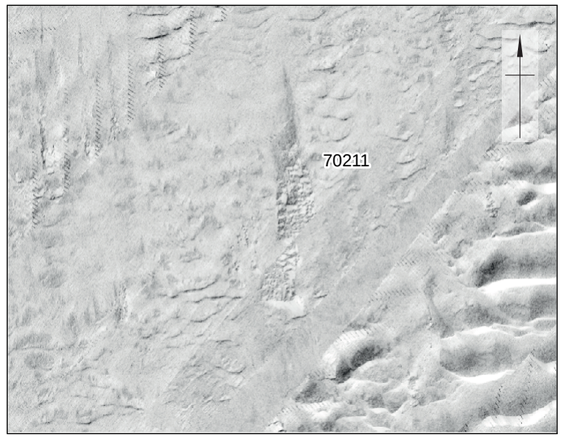
Multibeam echosounder image showing mound anomaly **70174**, facing north, measuring 31.4 x 17.1 x 1.0 m



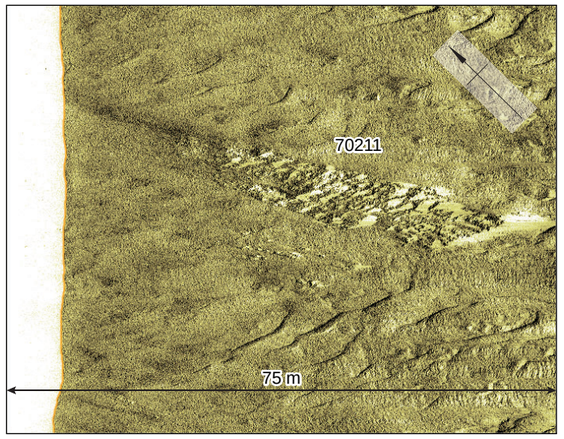
Magnetometer profile image of anomaly **70139** (measuring 333 nT)



Multibeam echosounder image showing seabed disturbance **70211**, facing north



SSS mosaic image showing seabed disturbance **70211**, facing north



Raw SSS waterfall image showing seabed disturbance **70211**, measuring 63.4 x 20.9 x 0.7 m

Date: 04/06/2025	Created by: AW	Revision: 0	Scale: NTS at A3

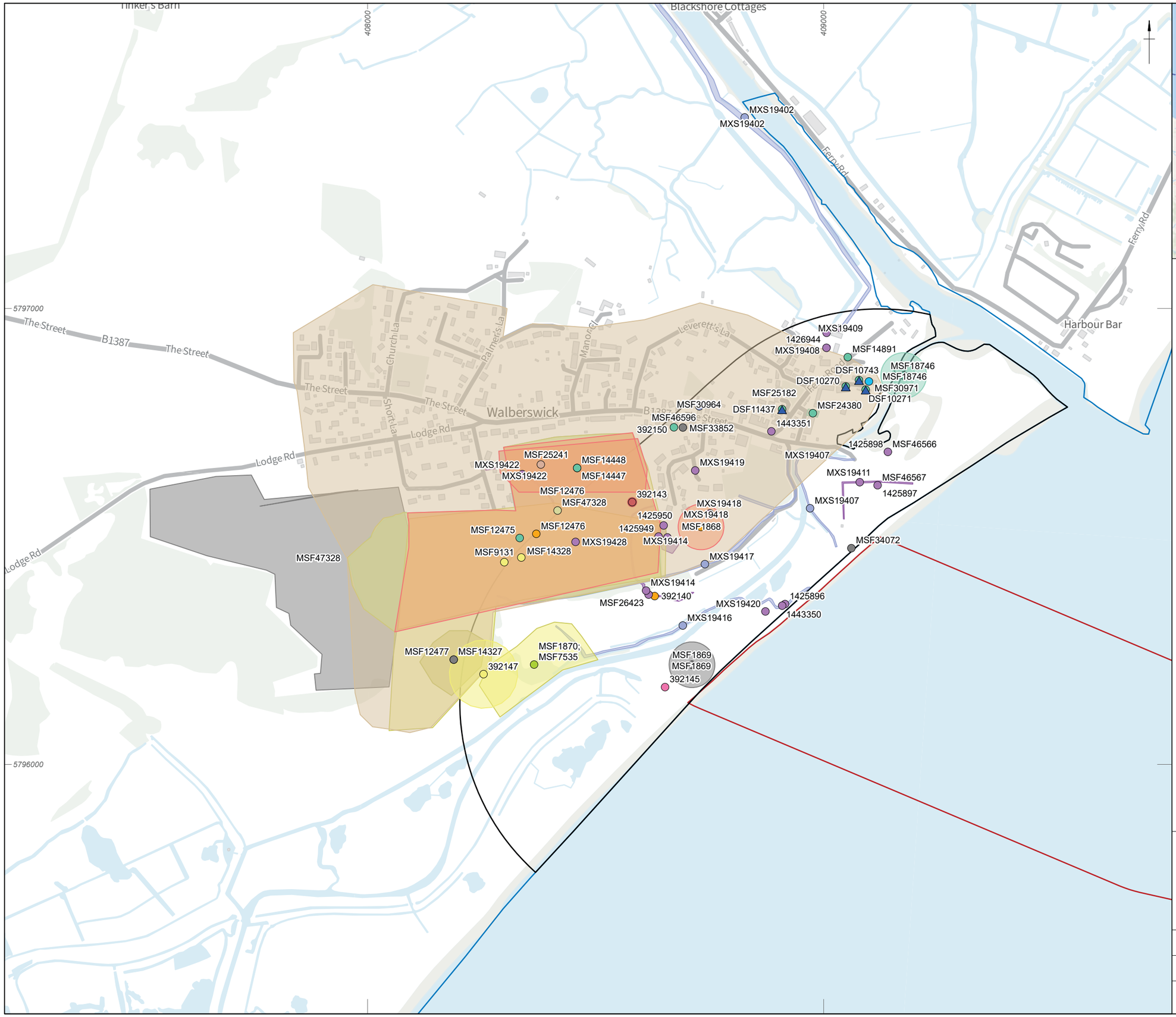
Figure 10. Data examples of seabed features

Coordinate system: ETRS 1989 UTM Zone 31N

Date: 23/07/2025 | Created by: KJF

Scale: 1:10,000 at A3 | Revision: 1

Figure 11: Intertidal heritage assets



Coordinate system: ETRS 1989 UTM Zone 31N

Date: 23/07/2025	Created by: KJF	
Scale: 1:8,000 at A3	Revision: 1	

Figure 12: Heritage assets located above MHWS

Wessex Archaeology Ltd registered office Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB
Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www. wessexarch.co.uk