Immingham Green Energy Terminal

TR030008

Volume 6

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Planning Act 2008

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

September 2023

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

Immingham Green Energy Terminal

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Summary

A marine archaeological technical report has been prepared for the proposed marine works relating to Immingham Green Energy Terminal (“IGET"), Port of Immingham, North East Lincolnshire.

This technical report comprises a marine archaeological baseline study of the proposed Project, based on an archaeological assessment of records held by national and local inventories and secondary sources relating to the marine and intertidal historic environment of the region. This archaeological baseline also includes an assessment of the value and sensitivity of any identified marine or intertidal archaeological receptors within the Site Boundary and additional 500m buffer study area.

Geophysical data were assessed to identify features of palaeogeographic potential within the study area. A total of four features were identified across the site boundary, of which three (a channel and two possible peat outcrops) were considered of potential archaeological interest.

Geophysical data were also assessed to identify features of archaeological potential relating to maritime and aviation activity. A total of 162 anomalies were identified across the Site Boundary.

An aerial photograph assessment was also undertaken in June 2023, accessing 99 records, in order to identify any potential unidentified heritage assets in the intertidal zone and to further quantify the presence of any known assets.

The proposed works comprise the construction, operation and maintenance of a terminal consisting of a jetty and associated loading/ unloading infrastructure, pipelines and metering systems. The site is situated to the east of the existing Port of Immingham and largely outside its operational area.

Three possible wrecks were identified in the desk-based assessment, as well as five records of 20th century port infrastructure and the location of a First World War anti-submarine boom, located beyond the Site Boundary.

Acknowledgements

Wessex Archaeology would like to thank the National Record of the Historic Environment for supplying sites and monuments data, the United Kingdom Hydrographic Office for supplying the known wreck and obstruction data, and North East Lincolnshire Historic Environment Record for supplying the corresponding Historic Environment Record data.

1 Introduction

Project Background

1.1.1 A marine archaeological technical report has been prepared for the proposed marine works relating to Immingham Green Energy Terminal ("IGET"), Port of Immingham, North East Lincolnshire (**Figure 1**).

1.1.2 This technical report is prepared in support of the Environmental Statement ("ES") for the Project [**TR030008/APP/6.2**].

1.1.3 This technical report comprises a marine archaeological baseline study of the Project, based on an archaeological assessment of geophysical data gathered as part of the Project surveys, an aerial photograph assessment, together with a review of records held by national and local inventories and secondary sources relating to the marine and intertidal historic environment of the region. This archaeological baseline also includes an assessment of the value and sensitivity of any identified marine or intertidal archaeological receptors within the site boundary and additional 500m buffer study area.

1.1.4 The proposed works comprise the construction, operation and maintenance of a terminal consisting of a jetty and associated loading/ unloading infrastructure, pipelines and metering systems. The site is situated to the east of the existing Port of Immingham and largely outside its operational area.

Development Proposal

Marine Infrastructure

1.1.5 The proposed marine works will consist of the creation of:

a. An open piled jetty approach trestle, up to 1.2km in length, which would extend from the river frontage in a north-easterly direction leading to the jetty structure and which would provide access for vehicles and pipework to and from the shore to the berth. The approach trestle would be 14m wide for the main length with increased widths of 17m and 27m for the passing places and an operations building respectively. The jetty approach connects to a jetty head to provide the berth. The jetty approach would be supported by up to 219 steel tubular piled (215 marine piles and four landside piles), with a diameter of up to 1.2m.

b. The jetty head would comprise (un)loading platforms with mechanical loading arms, and two breasting dolphins with fenders. The jetty head would be supported by up to 106 piles comprising up to 104 piles with a diameter of up to 1.5m and two monopiles (located in front of the jetty head/loading platform to provide fendering suitable for small vessels) with a diameter of up to 2.3m. The berth would support large (with a draught up to 12.8m) and small vessels;

c. Eight mooring dolphins linked to each other and to the jetty head by high level walkways to facilitate operational and maintenance access. The mooring dolphins would each be supported by nine steel tubular piles with a diameter of up to 1.5m (72 piles in total).

d. A jetty head building and a separate temporary refuge shelter to provide a safe and secure area for personnel in the event of an emergency.

e. A jetty operations building at the landside end of the jetty to house control/operations function and various electrical equipment (switchroom, operations room and welfare facilities).

f. Appropriate topside infrastructure installed on the jetty to load and unload vessels including marine loading arms, gangway, piping, maintenance access roadways and access ramps, wastewater collection and drainage and supporting utilities for handling liquid bulk shipments. The pipework would run along the jetty, over the existing seawall, to a connection point with the landside pipework.

g. The construction of lighting infrastructure, utilities (electrical systems, firewater systems, communications systems, security systems) and drainage.

Capital Dredge

1.1.6 A capital dredge of approximately 4,000m^3 (based on the latest available site-specific geotechnical and geophysical information) would be required to ensure accessibility and safe mooring for vessels on the berth at all states of the tide. The required dredge depth would be approximately 14.5m below Chart Datum.

Scope of Document

1.1.7 The purpose of this assessment is to determine, as far as possible from existing information, the nature, extent and significance of the known and potential marine archaeological resource within the boundary of the Project.

Aims

1.1.8 The specific aim of this marine archaeological technical report is to summarise the known and potential archaeological baseline within the Project area to subsequently inform the ES. The objectives of the assessment are as follows:

a. To provide details of relevant legislation, national and local planning policy, and best practice guidance.

b. To assess the geophysical survey datasets provided by the client in order to 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; and identify, locate and characterise hitherto unrecorded marine sites of archaeological potential.

c. To compare the geophysical interpretation with desk-based assessments, historical data, known archaeological sites and previous investigations in the vicinity of the Project area to outline the known and potential marine archaeological resource.

d. To assess the significance of the known and potential marine archaeological resource through weighted consideration of their valued components.

e. To recommend mitigation measures for any potential archaeological or cultural heritage receptors newly identified within the Project area, including the addition of new Archaeological Exclusion Zones ("AEZ") where necessary within the Project area.

Copyright

1.1.9 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 third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licence, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the Copyright, Designs and Patents Act 1988 with regards to multiple copying and electronic dissemination of the report.

2 Legislation, Guidance and Policy

Introduction

2.1.1 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. Further details can be found in Annex 2 of this report.

2.1.2 Historic England ("HE") is responsible for the archaeological resource within England's Territorial Waters, up to the 12 nautical mile (nm) limit. The Marine Management Organisation ("MMO") is responsible for licencing, regulating and planning marine activities in English territorial waters to ensure they are carried out in a sustainable way.

Marine Legislation

2.1.3 Within English territorial waters the following relevant legislation applies:

a. The Marine and Coastal Access Act 2009 and the Planning Act 2008. The legislation relevant to marine development within English territorial waters. Whilst the MCAA regulates marine licensing for works at sea, section 149A of the Planning Act 2008 enables an applicant for a Development Consent Order ("DCO") to include within the Order a Marine Licence which is deemed to be granted under the provisions of the MCAA.

b. Protection of Wrecks Act 1973 Sections 1 and 2. It is an offence to carry out certain activities in a defined area surrounding a wreck that has been designated unless a licence for those activities has been obtained from the Government. There are no protected wrecks within the footprint of the Project.

c. Ancient Monuments and Archaeological Areas Act 1979. It is a criminal offence to carry out any works on, or near to, a Scheduled Monument without Scheduled Monument Consent. Both terrestrial and maritime sites, including wrecks, may be designated under this Act. There are no scheduled ancient monuments within the footprint of the Project.

d. Protection of Military Remains Act 1986. This Act provides protection for the wreckage of military aircraft and designated military vessels. The Act provides for two types of protection: 'protected places' and 'controlled sites'. Military aircraft are automatically protected, although vessels have to be specifically designated. The primary reason for designation is to protect as a 'war grave' the last resting place of servicemen; however, the Act does not require the loss of the vessel to have occurred during the war. There are no protected places or controlled sites within the footprint of the Project.

e. Treasure Act 1996. All information required by the Treasure Act (i.e., finder, location, material, date, associated items etc.) will be reported to the coroner within 14 days. Items falling under the Treasure Act will be removed from the site by the Retained Archaeologist and stored in a secure location, pending a decision by the coroner.

f. Merchant Shipping Act 1995. All wreck material recovered from UK waters must be declared to the Receiver of Wreck who acts to settle questions of ownership and salvage. 'Wreck' refers to all items of flotsam, jetsam, derelict, and lagan found in or on the shores of the sea or any tidal water.

g. Planning (Listed Buildings and Conservation Areas) Act 1990 (as amended). Works affecting Listed Buildings are subject to additional planning controls. The Act 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.

2.1.4 Marine heritage receptors may be designated under the Protection of Wrecks Act 1973 and the Ancient Monuments and Archaeological Areas Act 1979. Military wrecks and aircraft remains may be protected under the Protection of Military Remains Act 1986. Ownership of any wreck remains is determined in accordance with the Merchant Shipping Act 1995.

International conventions

2.1.5 The United Nations Educational, Scientific and Cultural Organisation ("UNESCO") Convention on the Protection of the Underwater Cultural Heritage was concluded in 2001 and is a comprehensive attempt to codify the law internationally with regards to underwater cultural heritage. The UK has not ratified the Convention, but 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 2 January 2009 having been ratified by 20 member states. It has since been ratified or accepted by an additional 72 member states.

Policy

National Policy Statement for Ports ("NPSfP")

2.1.6 As the Project is a Nationally Significant Infrastructure Proposal ("NSIP"), the NPSfP provides a framework for decisions on proposals for new port developments. The NPSfP recognises the importance of the historic environment and that the construction, operation and decommissioning of port infrastructure has the potential to result in adverse impacts on it (Ref 1-10, Section 5.12). Therefore, the significance of heritage assets and the extent of the impact of the Project on the significance of any heritage assets has to be understood (Ref 1-10, Section 5.12.9). Both designated heritage assets and undesignated heritage assets have to be considered, and the setting of a heritage asset also has to be taken into account.

2.1.7 The NPSfP advises that an ES should include:

a. A description of the significance of the heritage assets affected by the Project and the contribution of their setting to that significance.

b. Appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation.

c. Consideration of the possibility of damage to buried features from underwater disposal of dredged material.

d. An assessment of the extent of the impact of the Project on the significance of any heritage assets affected (Ref 1-10, Section 5.12).

2.1.8 The NPSfP also advises that the assessment should take account of other relevant UK policies and plans, including the Marine Policy Statement ("MPS)" and any existing marine plans provided for by the MCAA 2009 (Ref 1-10, Section 4.1.1).

UK Marine Policy Statement (MPS)

2.1.9 UK MPS was adopted in 2011 by all UK Administrations as part of a new system of marine planning being introduced across UK seas (Ref 1-26). The statement was intended to facilitate and support the formulation of Marine Plans, ensuring that marine resources are used in a sustainable way in line with high level marine objectives.

2.1.10 Under the MCAA, England was divided into marine planning regions, with an associated authority responsible for preparing a Marine Plan for that area. The MPS sets out the framework for preparing Marine Plans and making decisions affecting the marine environment. The MPS also states that Marine Plans must ensure a sustainable marine environment that will protect heritage receptors. Marine plans must also be in accordance with other UK national policy, including the National Planning Policy Framework ("NPPF") (Ref 1-31).

2.1.11 As part of the NPPF (Ref 1-31), a core planning principle is to conserve heritage receptors 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 (Ref 1-31, 55).

2.1.12 Section 16 of the NPPF, entitled '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.

East Inshore Marine Plan

2.1.13 The MMO have divided the inshore and offshore waters around England into 11 plan areas for which marine plans are to be produced. The Project is within the East Inshore Marine Plan Area which has been adopted as of April 2014 (Ref 1-9).

2.1.14 The East Inshore Marine Plan Policy SOC2 states that proposals that may affect heritage receptors should demonstrate, in order of preference:

a. That they will not compromise or harm elements which contribute to the significance of the heritage asset.

b. How, if there is compromise or harm to a heritage asset, this will be minimised.

c. How, where compromise or harm to a heritage asset cannot be minimised, it will be mitigated against.

d. The public benefits for proceeding with the proposal if it is not possible to minimise or mitigate or compromise the harm to the heritage asset.

Marine Guidance

2.1.15 This assessment was carried out in a manner consistent with available guidance as described below in chronological order of issue:

a. Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers (Ref 1-12).

b. Managing Lithic Scatters: Archaeological Guidance for planning authorities and developers (Ref 1-13).

c. Military Aircraft Crash Sites: Guidance on their Significance and Future Management (Ref 1-14).

d. Code for Practice for Seabed Development (Ref 1-28).

e. Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (Ref 1-15).

f. Our Seas – A Shared Resource: High Level Marine Objectives (Department for Environment, Food and Rural Affairs (Ref 1-8).

g. Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (second edition) (Ref 1-16).

h. Ships and Boats: Prehistory to Present – Designation Selection Guide (Ref 1-17).

i. Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (Ref 1-3).

j. Standard and guidance for archaeological field evaluation (Ref 1-4).

k. Standard and Guidance for Historic Environment Desk-based Assessment (Ref 1-5).

l. Standard and guidance for nautical archaeological recording and reconstruction (Ref 1-6).

m. Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest, Guidance Document No 124-2014 (Ref 1-33).

n. Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Ref 1-20).

o. Managing Significance in Decision-Taking in the Historic Environment: Good Practice Advice in Planning Note 2 (Ref 1-21).

p. Preserving Archaeological Remains: Decision-taking for Sites under Development (Ref 1-22).

q. The Assessment and Management of Marine Archaeology in Port and Harbour Development (Ref 1-23).

r. Deposit Modelling and Archaeology. Guidance for Mapping Buried Deposits (Ref 1-24).

s. Curating the Palaeolithic (Ref 1-25).

3 Methodology

Study Area

3.1.1 The marine study area for this assessment is the area over which potential direct and indirect effects of the proposed Project were predicted to occur on marine heritage receptors during the construction and operational phases.

3.1.2 The study area therefore comprises the site boundary of the Project below Mean High Water Springs ("MHWS") (**Figure 1**). This encompasses all direct impacts from construction and dredging. A further 500m buffer zone beyond the area of the site boundary has been included in order to capture relevant proximate heritage receptors in the assessment that could be affected indirectly.

3.1.3 The geophysical study area is defined as the extents of the Project site boundary (**Figure 1**). Geophysical data were assessed beyond the site boundary to better understand the geological context of the site and also to allow for any features which may require an AEZ to be identified with a 100m buffer of the site boundary. Relevant features within, or overlapping, the Project site boundary are included in this report underpinning the ES baseline and providing relevant context for defining the assessment of potential impacts and appropriate mitigation strategies if required.

Archaeological Desk-based Assessment

Key Themes

3.1.4 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 (Ref 1-5).

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

a. Seabed prehistory (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g. handaxes).

b. Seabed features, including maritime sites (such as shipwrecks and associated material including cargo, obstructions and fishermen's fasteners) and aviation sites (aircraft crash sites and associated debris).

c. Intertidal heritage receptors.

d. Historic seascape character.

Data Sources

3.1.6 Current baseline conditions have been determined by a desk-based review of available information.

3.1.7 The main desk-based sources of information that have been reviewed to inform the current baseline description within the vicinity of the Project include:

a. United Kingdom Hydrographic Office ("UKHO") wreck database (acquired 17 June 2022).

b. Historic England's National Record of the Historic Environment ("NRHE"), (acquired 17 June 2022).

c. North East Lincolnshire Council ("NELC") Historic Environment Records ("HER") (acquired 22 Aug 2022).

d. Aerial Photography assessment (acquired June 2023).

e. Various online resources including the BGS Geology of Britain Viewer.

f. Historic Seascape Characterisation ("HSC") using the consolidated HSC national database (Ref 1-29).

g. Historical maps and Ordnance Survey maps.

h. Relevant primary and secondary sources in Wessex Archaeology's own library and those available through the Archaeology Data Service and other websites. Both published and unpublished archaeological reports relating to excavations and observations in the area around the study area were reviewed.

3.1.8 The Lincolnshire Historic Landscape Characterisation does not cover the intertidal or marine zone as so falls outside the current area of study.

Data Structure

3.1.9 This report is supported by a Geographic Information System ("GIS") using ArcGIS 10.8.1, 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 maritime and aviation resources within the study area.

3.1.10 Within this assessment, the gazetteer is compiled and presented in British National Grid ("BNG"), with heights calculated as distance above Ordnance Datum (Newlyn), as defined by OSGM15 and OSTN15.

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

Chronology

3.1.12 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.

3.1.13 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 Annex 1, which reflects the archaeological record documented from coastal and marine contexts.

Seabed Prehistory

3.1.14 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 and has been enhanced by the review of Project-acquired sub-bottom profiler datasets and available geotechnical information (see Section 4, Annex 4).

Seabed Features: Maritime and Aviation Sites

3.1.15 The sources of data for maritime and aviation archaeology listed above have been collated and summarised in order to develop a baseline of marine archaeology for the study area, and the potential for encountering unknown shipwreck and aircraft crash sites (see Section 5). Sources of data relevant to maritime and aviation archaeology are the UKHO, NRHE and NELC HER.

3.1.16 The data obtained were reviewed and those located within the study area were extracted and compiled to form a gazetteer as part of the known maritime and aviation baseline. These records were each given a unique identifier beginning with 2000 continuing sequentially (Annex 4).

3.1.17 For the purpose of this assessment, records with duplicate positions between datasets were amalgamated. The presented co-ordinates were derived from the most precise dataset (typically the UKHO). These are based on hydrographic survey data presented in World Geodetic System ("WGS") 1984 datum. These co-ordinates were projected from WGS84 into BNG eastings and northings using the Quest Geodetic Calculator.

3.1.18 Data from the NRHE and HER is provided in two spatial formats, points and polygons. All points and polygons below the MHWS mark that intersect the study area have been included within the assessment, however, it should be noted that co-ordinates given for the polygon records is the centroid generated using ArcGIS 10.8.1, which may lie outside the study area. If relevant, some polygons have been retained as polygons in order to properly represent their spatial extent.

3.1.19 Data relating to Recorded Losses were also extracted from the NRHE, HER and UKHO 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 by the NRHE, and 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. As such, they signify the potential maritime and aviation resource.

3.1.20 Details regarding maritime Recorded Losses, whose Named Location happens to be located within 2km of the Project, are presented in a gazetteer format (Annex 6 and 7). These records have retained their original identification assigned by the UKHO, NRHE or HER for ease of cross referencing. These gazetteers do not include positional data due to the inaccuracies therein.

3.1.21 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 (Ref 1-14; Ref 1-36).

Intertidal Archaeology

3.1.22 All sites considered in the baseline in the intertidal area are included in the gazetteer in Annex 4.

3.1.23 An intertidal walkover survey was attempted at low tide on 25 October 2022, but unsafe ground conditions prevented access. Alternative approaches were considered for enhancing the ES baseline, and an archaeological assessment of historical aerial photographs was undertaken in June 2023.

Aerial Photography Methodology

3.1.24 An aerial photography assessment was undertaken in June 2023. This assessed records, consisting of historical aerial photographs, held by Historic England.

3.1.25 A search request was submitted to the Historic England archives (ref: AP/139117) for all aerial photos held which covered any part of the 500m study area, submitted as a shape file. The search returned a total of 110 vertical photos, 17 oblique photos and 19 military oblique photos.

3.1.26 All photos were viewed in person at the Historic England archive. Of the 146 results returned from the search request, 47 of the vertical photos were found not to be held by Historic England. Digital copies were made of the remaining 99 photos for further reference.

3.1.27 The physical photos and the digital copies were visually assessed, in conjunction with the marine gazetteer in order to identify any potential unidentified heritage assets in the intertidal zone and to further quantify the presence of any known assets.

3.1.28 A list of all photos viewed have been reproduced in the gazetteers in Annex 8.

Historic Seascape Characterisation

3.1.29 In accordance with the European Landscape Convention, ‘landscape’ can be defined as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and /or human factors’ (Ref 1-7). The term ‘seascape’ can be defined as a subset of ‘landscape’, and has ‘an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land and sea, by natural and / or human factors’ (Ref 1-7).

3.1.30 Seascape assessment reflects the holistic approach to landscape assessment as defined in the European Landscape Convention, extending it to the sea. Seascape Character Areas include coastal land, intertidal and marine environments up to the inshore limit (12nm). HSC is the identification and interpretation of the historic dimension of the present day coastal and marine

environment (Ref 1-32). This is done by mapping and describing the historic cultural influences which define present seascape perceptions across all of England's marine areas and costal land.

3.1.31 The baseline summary for character of the historic seascape for the section of the study area within English inshore waters was assessed using the results of the consolidated HSC national database (Ref 1-29). The HSC include ArcGIS shapefiles of the character areas and reports including a regional and national assessment of the historic seascape character types.

Geophysical and Geotechnical Methodology

Co-ordinate system

3.1.32 The survey data were acquired in ETRS89 UTM 30N co-ordinates and converted to OSGB 36 using the OSTN15 transformation by ABP Marine Environmental Research Ltd (ABPmer). The data were provided to Wessex Archaeology in OSGB 36 BNG co-ordinates, and the results have been presented using this co-ordinate system.

Data sources

3.1.33 A number of data sources were consulted during this assessment, including:

a. Geophysical survey datasets acquired by ABPmer.
b. Vibrocore logs acquired by Fugro in 2023 and provided to Wessex Archaeology by ABPmer.
c. Recorded wreck and obstruction data acquired via the UKHO;
d. Relevant background mapping from the area (admiralty charts received from MarineFIND).
e. Lincolnshire HER and NRHE monument and site records.
f. Client supplied survey reports (Ref 1-2).

Technical specifications

3.1.34 The geophysical data were acquired by ABPmer onboard the Wessex Explorer. The multibeam echosounder ("MBES"), sidescan sonar ("SSS") and magnetometer ("MAG") survey operations took place on 10 – 13 February 2023 with the sub-bottom profiler ("SBP") survey taking place between 7 – 12 March 2023. The mainlines were acquired with a 20m line spacing, reducing to 10m directly over the proposed berth footprint and proposed jetty structure, with crosslines acquired at a 100m line spacing. 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
ABPmer	*Wessex Explorer*	SPB	Geo Marine systems boomer and a geo marine systems freshwater sparker	.sgy
		MBES	Norbit iWBMSh	.xyz
		SSS	Edgetech 4125 (400/900 kHz, between 25 and 50m range)	.xtf
		Mag.	Geometrics G-882	.xls
		Positioning	POSMV Oceanmaster	N/A

Processing

3.1.35 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 v8.1	ArcMap v10.8
MBES	QPS Fledermaus v8.5.2	
SSS	N/A	
Mag.	Wessex Proprietary Software	

3.1.36 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.

3.1.37 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.

3.1.38 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 1,600ms-1. This is a standard estimate for shallow, unconsolidated sediments.

3.1.39 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.

3.1.40 For the SBP assessment, 25% of the lines were initially assessed. Where features of interest were identified, additional lines were then interpreted in order to map the extents of these features more accurately.

3.1.41 The MBES data were analysed to identify any unusual seabed structures that could be shipwrecks or other anthropogenic debris. The data were gridded at 0.25m using QPS Fledermaus software, from which an RGB shaded raster was generated and analysed.

3.1.42 The high-frequency SSS mosaic provided by ABPmer was used, alongside the MBES raster, to locate and analyse any objects of possible anthropogenic origin. This involves creating a database of anomalies within ArcMap by tagging individual features of possible archaeological potential and recording their positions and dimensions.

3.1.43 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.

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

3.1.45 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.

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

Data quality

3.1.47 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.

3.1.48 The quality of the SBP data has been rated as 'Variable' using the above criteria. In general the data were of good quality, but some lines were seen to be affected by swell noise. Furthermore, it is noted in the survey report (Ref 1-2) that due to river current causing issues with the equipment laybacks, there may be some positional errors in the final data set.

3.1.49 The MBES data were rated as 'Good' using the above criteria. The data quality and resolution of 0.25m was found to be of a good standard and suitable for archaeological assessment of objects and debris over 0.25m in size.

3.1.50 The SSS data have been rated as 'Variable' using the above criteria table. The data quality was good within areas of the mosaic imaged in the mid-ranges, but data edges and overlap caused some regions to be obscured.

3.1.51 The Mag. data have been rated as 'Average' using the above criterial table. The data appear well-positioned and dipolar features are clearly imaged, although the survey lines slightly deviate, leading to small regions of higher line spacing.

Anomaly Grouping and Discrimination

3.1.52 The previous section describes the initial interpretation of the combined SSS/MBES features, and the magnetic features, 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.

3.1.53 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, an MBES anomaly, and one Mag. anomaly.

3.1.54 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 to proposed scheme

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

3.1.55 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.

3.1.56 Any anomalies located outside of the defined geophysical study areas, 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.

Geotechnical Cores

3.1.57 A total of 16 vibrocores were acquired during a geotechnical survey within the study area (**Figure 2**). The preliminary core logs were provided to Wessex Archaeology to enhance the palaeogeographic interpretation.

Impact Assessment Criteria

Receptor Sensitivity

3.1.58 In order to assess the potential impacts of a development upon marine cultural heritage, the conceptual approach known as the 'source-pathway-receptor' model is adopted. 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 receptors). For the significance of any given impact to be fully understood and for appropriate mitigation to be proposed, the sensitivity of any marine cultural heritage receptors that may be impacted need to be considered. This section outlines how the sensitivity of marine heritage receptors is ascertained.

3.1.59 The capability of a receptor to accommodate change and its ability to recover if affected is a function of its sensitivity. Receptor sensitivity is typically assessed via the following factors:

a. Adaptability - the degree to which a receptor can avoid or adapt to an effect.

b. Tolerance - the ability of a receptor to accommodate temporary or permanent change without significant adverse impact.

c. Recoverability - the temporal scale over and extent to which a receptor will recover following an effect.

d. Value - a measure of the receptor's importance, rarity and worth.

3.1.60 Cultural heritage and marine archaeology receptors cannot typically adapt, tolerate, or recover from physical impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each receptor is predominantly quantified only by its value.

Value of a Receptor

3.1.61 Based on Historic England’s Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment, the significance of a historic receptor “embraces all the diverse cultural and natural heritage values that people associate with it, or which prompt them to respond to it” (Ref 1-15, 21).

3.1.62 Within this document, value is weighed by consideration of the potential for the receptor to demonstrate the following value criteria:

a. Evidential value – deriving from the potential of a place to yield evidence about past human activity.

b. 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.

c. Aesthetic value – deriving from the ways in which people draw sensory and intellectual stimulation from a place.

d. 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.

3.1.63 With regards to assessing the value of shipwrecks, the following criteria listed in English Heritage's Ships and Boats: Prehistory to Present – Designation Selection Guide (Ref 1-17) can be used to assess a receptor in terms of its value:

a. Period
b. Rarity
c. Documentation
d. Group value
e. Survival/condition
f. Potential

3.1.64 These aspects help to characterise each receptor whilst also comparing them to other similar receptors. The criteria also enable the potential to contribute to knowledge, understanding and outreach to be assessed.

3.1.65 The value of known archaeological and cultural heritage receptors were assessed on a four-point scale using professional judgement informed by criteria provided in **Table 5** below.

Table 5 Criteria to assess the archaeological value of marine receptors

Value	Definition
High	Best known, only example or above average example and/or significant or high potential to contribute to knowledge and understanding and/or outreach. Receptors with a demonstrable international or national 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; andKnown submerged prehistoric sites and landscapes with the confirmed presence of largely in situ artefactual material or 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 outreach; 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; and

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 outreach; 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; and 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 outreach. Receptor with little or no surviving archaeological interest.

3.1.66 Furthermore, On the Importance of Shipwrecks (Ref 1-35) report suggests importance can also be assessed through the BULSI system, incorporates the following criteria: build, use, loss, survival and investigation; this is described further below.

3.1.67 To further supplement this approach, the ALSF-funded Marine Class Description and principles of selection for aggregate producing areas project (ALSF 5383), undertaken by Wessex Archaeology (Ref 1-37), proposed a composite timeline that considers wrecks in five distinct date ranges. The timeline considers the broad chronology of shipbuilding, thus drawing out generalisations regarding the age and special value of sites. The timeline is summarised as follows:

a. Pre- 1500 AD: this covers the period from the earliest Prehistoric evidence for human maritime activity to the end of the medieval period, c. 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.

b. 1500 to 1815: this encompasses the Tudor period in England and the Stuart periods in Scotland and Britain, the Wars of the Three Kingdoms, the Anglo-Dutch Wars and later the American Independence and French Revolutionary Wars. Wreck and vessel remains from this date are also quite rare, and can be expected to be of special value.

c. 1816 to 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.

d. 1914 to 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.

e. 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.

3.1.68 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.

3.1.69 Wrecks dating from 1816 to the present day are more plentiful amongst known wrecks. The Marine Class Description and Principles of Selection project (Ref 1-37) 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 (Ref 1-39) 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 and Principles of Selection project (Ref 1-37) and historical thematic studies.

3.1.70 The Early Ships and Boats Prehistory to 1840 provided further information about earlier vessels (Ref 1-40). 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:

a. Does it illustrate a key narrative of the period.

b. Does it represent a distinct and tangible link to significant persons or events.

c. Is it representative of significant loss of life or related responses in seafaring safety.

d. Does it make a distinct cultural contribution.

e. Does it have current relevance or parallels.

3.1.71 The perceived value of each marine archaeological receptor is generally assessed and assigned on a site-by-site basis, depending on the criteria listed in **Table 5**. The UK Marine Policy Statement (Ref 1-26) describes a heritage receptor as holding a degree of significance. Significance relates to the heritage interest of a receptor that may be archaeological, architectural, artistic or historic.

3.1.72 Furthermore, 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.

Assumptions and Limitations

Archaeological Data

3.1.73 Data used to compile this report comprises primary geophysical survey data and secondary information derived from a variety of sources. The assumption is made that the secondary data, as well as that derived from other secondary sources, are reasonably accurate.

3.1.74 The records held by the UKHO, NRHE, HER and the other sources used in this appraisal are not a record of all surviving cultural heritage receptors, 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.

Geophysical Data

3.1.75 The geophysical data were assessed to identify features of archaeological potential relating to maritime and aviation activity. Due to the proximity of the area to the modern port workings, many of the objects identified are likely to represent modern features which would not be of interest from an archaeological perspective. Typically, this cannot be confirmed without visual inspection as such all features identified in the assessment have been retained as a precautionary measure and archaeological potential has been assigned based on the methodology described in Section 10.

4 Baseline Assessment: Palaeogeopgraphy

Geological Baseline and Archaeological Potential

4.1.1 The site lies on an industrialised section of the Killingholme Marshes on the Humber at Immingham. This low-lying area is known as the Outmarsh.

4.1.2 The underlying solid geology is Upper Cretaceous Chalk. Locally there are two formations: Flamborough Chalk and Burnham Chalk. The younger Flamborough Chalk has identifiable bedding surfaces, distinct marl bands and is without flint. The underlying Burnham Chalk, which subcrops along the eastern part of the site, is thinly bedded and laminated and contains continuous flint bands. The Port of Immingham is located at a point where the Burnham Chalk Formation is not covered by the Flamborough Chalk Formation (see BGS 1:50,000 Bedrock Geology mapping).

4.1.3 The chalk surface is characterised by a highly fractured zone created by glacial and periglacial processes, and overlain by Pleistocene deposits of Glacial Till. These glacial and post-glacial sequences are subsequently overlain by fine-grained (Clay and Silt) Tidal Flat Deposits.

4.1.4 Beyond areas of industrial development, the Outmarsh comprises Holocene peats, estuarine alluvium, and tidal flat deposits of sands, silts, and clays (Ref 1-11).

Palaeogeographic Assessment Results

4.1.5 A number of palaeogeographic features of archaeological potential have been identified within the study area. These features are discussed below, individually described in gazetteer format in Annex 3, and their distribution is illustrated in **Figure 2**. A total of 16 vibrocores were acquired during a geotechnical survey within the study area (**Figure 2**). The preliminary core logs were provided to Wessex Archaeology to enhance the palaeogeographic interpretation.

4.1.6 The identified geology within the study area has been divided into 4 phases, as described in **Table 6** below:

Table 6: Shallow stratigraphy of the study area

Unit	Unit Name	Geophysical Characteristics(1)	Sediment Type(2)	Archaeological Potential
4	Holocene riverbed Sediments (Marine Isotope Stage (“MIS”) 1)	Generally observed as a veneer or infilling depressions. Boundary between surficial sediments and underlying units not always discernible.	Alluvium deposits comprising soft silts, sand and clay. Possibly contains organic material and/or peat.	Potential to contain in situ and derived archaeological material, and palaeoenvironmental material.
3	Holocene Sediments (Pre-transgression) (MIS 2 to 1)	Small shallow infilled channels with acoustically chaotic fill	Fluvial, estuarine and terrestrial deposits.	Potential to contain in situ and derived archaeological material, and

Unit	Unit Name	Geophysical Characteristics(1)	Sediment Type(2)	Archaeological Potential
				palaeoenvironmental material.
2	Glacial till (Late Devensian; MIS 5d - 2)	Acoustically unstructured unit with occasional internal reflectors.	Stiff, gravelly, sandy clay.	Unlikely to be of archaeological potential as deposited under an ice sheet, although upper layers could have been a land surface.
1	Upper Cretaceous chalk	Acoustically unstructured unit with a generally well-defined basal reflector.	Chalk	Pre-Earliest occupation of the UK

(1) Based on geophysical data

(2) Based on ABPmer (Ref 1-2) and Wessex Archaeology (Ref 1-41)

4.1.7 The oldest shallow geological unit identified within the geophysical study area is interpreted to be Upper Cretaceous chalk (Unit 1). Unit 1 is expected to be present throughout the geophysical study area, either at the surface or beneath a veneer of alluvium (Unit 4) in the north, or overlain by Till (Unit 2) in the south. Unit 1 was deposited prior to the earliest occupation of the UK and, as such, is not considered to be of archaeological potential.

4.1.8 Overlying Unit 1 in the southern portion of the geophysical study area is a unit of glacial till (Unit 2). Unit 2 is seen in the SBP data to be acoustically unstructured with occasional internal reflectors, possibly split into an upper and lower unit. As an interpreted glacial deposit, this unit will have been deposited within an environment uninhabitable by humans and, as such, Unit 1 is not considered of archaeological potential. However, the upper surface of the till, where preserved, could have been a surface upon which later artefacts may have been deposited.

4.1.9 Cutting into Unit 2 are a couple of possible channel features, interpreted as being early Holocene in age. One of these features (**7502**) is interpreted as containing preserved fluvial sediments (Unit 3) (**Figure 3**). In the SBP data, this feature is seen to have acoustically chaotic fill and an occasionally distinct basal reflector, although this is not always clearly distinguishable and, as such, there is some uncertainty around the exact depth and extent of the feature. Channel **7502** appears to correspond in part with a channel feature identified at the surface in the MBES data (**7500**), which is seen to meander across the southern section of the geophysical study area, orientated approximately south-west to north-east. It is possible that **7502** represents an earlier phase of channelling with **7500** representing a later channel cutting phase, or it may represent the same phase of channelling as **7500**, but with some of the fill preserved.

4.1.10 Although both **7500** and **7502** both represent channels, feature **7500** is considered of lower archaeological potential. This is due to the fact it is seen as an erosive feature with no clear evidence of preserved fill (beyond that interpreted as **7502**). As such, the likelihood of it containing either archaeological artefacts or material of palaeoenvironmental interest is lower. However, as it is still likely to have formed as a terrestrial feature during a period of human occupation, it is still considered as of some interest.

4.1.11 Unit 4 is expected to be present across the geophysical study area, either as a veneer, or thickening out in areas where it is seen to infill depressions at the top of Unit 2. The age of this unit is uncertain. Some of it is likely to be more modern sediments, deposited post marine transgression. However, in the SBP data, numerous small patches of seismic attenuation are identified, indicating the possible presence of gas which may be caused by the biogenic breakdown of organic matter, or of sediments containing high amounts of organic material at the surface which may have been deposited in a terrestrial environment. Furthermore, two areas of a possible platform have been identified in the MBES data (**7501** and **7503**).

4.1.12 These have been tentatively interpreted as possible outcropping peat due to similarities between these features and nearby marine examples found by vibrocoring to contain peat (Ref 1-41). Although the age of the peat is uncertain, given its position above what is interpreted to be Devensian till there is the possibility that it may be Holocene (Ref 1-41). If these features are found to be peat deposits, it is likely that they may be of high archaeological and palaeoenvironmental potential.

4.1.13 Furthermore, terrestrial geoarchaeological investigations conducted for the Project (Ref 1-42) and wider Humber estuary have similarly shown evidence of locally preserved peats (see **Chapter 14: Historic Environment (Terrestrial) [TR030008/APP/6.2]**).

4.1.14 It should be noted that the preliminary marine vibrocore logs showed no evidence of peat within the study area; however, as only one of the vibrocores was located within the area of possible peat outcropping, it may be that peat is present beyond this location and, as such, the features have been retained as of high potential.

Value

4.1.15 The values of different types of prehistoric heritage receptors are shown in **Table 7.**

Table 7: Value of seabed prehistory heritage receptors

Receptor Type	Description	Value
In-situ Prehistoric sites	Primary context features and associated artefacts and their physical setting (if found).	High
	Known submerged prehistoric sites and landscape features with the demonstrable potential to include artefactual material.	
Submerged landscape features (without associated archaeological material)	Other known submerged palaeo-landscape features and deposits likely to date to periods of prehistoric archaeological interest with the potential to contain in situ material.	Medium
Isolated Prehistoric finds	Isolated discoveries of prehistoric archaeological material discovered within secondary contexts.	Medium
Palaeo-environmental evidence	Isolated examples of palaeo-environmental material	Low
	Palaeo-environmental material associated with specific palaeo-landscape features or archaeological material	

5 Baseline Assessment: Maritime and Aviation Sites

Introduction

5.1.1 The following section is based on records of known shipwrecks, aircraft crash sites and obstructions.

Designated Sites

5.1.2 There are no sites within the study area that are subject to statutory protection from the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monuments and Archaeological Areas Act 1979; the three principal statutes that could be used to protect marine archaeological sites.

Known Maritime and Aviation Sites

5.1.3 There are three known wreck sites within the study area (**Figure 4**; Annex 4). Wreck **2003** was listed as dead in **2004**, i.e. it has not been detected by repeated surveys, although wreck material still may exist at this location. This consists of the possible remains of a craft recorded between 1991 and 1999. **2006** is an unknown wreck, shown on Humber 8, April 2009. Wreck **2008** is the wreck of *Hvitveis*, a Norwegian schooner built in 1915, which foundered following a collision with the Danish registered SS *Ulla* en route from Goole or Kingston-upon-Hull to Rouen with a cargo of coal.

5.1.4 A number of sites relate to port infrastructure and include the jetties and dolphins associated with the 20th century port (**2001, 2002, 2004, 2005, 2007** and **2009**). These will be discussed in the intertidal assessment below (Section 6).

Geophysical Seabed Features Assessment

5.1.5 The results of this assessment are collated in gazetteer format detailed in Annex 5 and illustrated in **Figure 4**.

5.1.6 A total of 162 features have been identified as being of possible archaeological potential within the study area and are discriminated as shown in **Table 8**.

Table 8: Anomalies of archaeological potential within the study area

Archaeological Discrimination	Number of Anomalies	Interpretation
A2_h	74	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature
A2_l	88	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature
Total	**162**	

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

5.1.8 A total of 74 anomalies have been classified as A2_h, which are features or areas with a higher probability of being anthropogenic in origin. However, due to the nature of the survey area and the recent maritime activity within the port it is likely that most features are modern in origin.

5.1.9 A total of 88 anomalies have been classified as A2_l, which are possibly of anthropogenic origin but also may be natural features. In particular, the areas contained inside the debris fields are likely to be comprised of both natural and anthropogenic features, although it is likely that the latter are modern.

5.1.10 Some example images of anomalies identified in this survey can be found in **Figure 5**. The high prevalence of anomalies within the study area, suggests that many of the detected features are indeed likely to be related to more recent activities.

Table 9: Types of anomalies identified

Archaeological 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	32
Debris	Distinct objects on the seabed, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin.	16
Debris field	A discrete area containing numerous individual debris items that are potentially anthropogenic, and can include dispersed wreck sites for which no coherent structure remains	30
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 original. May represent linear anthropogenic debris which can include, for instance, lengths of rope or chain or abandoned fishing gear.	24
Magnetic	No associated seabed surface expression, and have the potential to represent possible buried ferrous debris or buried wreck sites	53
Magnetic area	A magnetic area comprising multiple magnetic responses over multiple profiles.	1

Archaeological Classification	Definition	Number of Anomalies
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris.	3
Seabed disturbance	An area of disturbance without individual, distinct objects. Potentially indicates wreck debris or other anthropogenic features buried just below the seabed.	2
Total		**162**

Maritime Archaeological Potential

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

5.1.12 As an island, Great Britain has a long maritime history with potential for the archaeological evidence of maritime sites from the late Mesolithic through to the present day. The Humber is one of the largest estuaries in Britain with a rich and nationally important archaeological, geological and palaeoenvironmental record. It has been, and still is, a significant transport, trade and communication route. Maritime sites are defined for the purposes of this assessment as either wrecks (seagoing vessels or aircraft) and/or material that has been accidentally or deliberately lost overboard from a vessel or aircraft. The Project lies close to some of the historic shipping routes for British vessels travel along the east coast, with vessels stopping at intermediate ports, including Port of Hull, Grimsby, New Holland and North Killingholme Haven. The main drivers for these routes were the trade in coal, ship building, the steel industry, and the fishing industry.

5.1.13 Maritime archaeological finds from the medieval period and earlier will be of national interest and will hold special significance. Any post medieval finds would also be of special interest, but such finds are more common than those of earlier dates. More examples of boats and ships exist from the modern period; therefore, more discrimination would be required to determine the importance of any remains discovered. Due to the considerable changes in shipbuilding during this period, any remains discovered showing evidence of this could be considered as being of particular interest. The losses attributed to the two World Wars have been considered as significant due to the magnitude of the loss endured by all countries involved and for their potential to be categorised as war graves under the Protection of Military Remains Act 1986.

Recorded Losses

5.1.14 Recorded Losses are predominantly reported to have stranded in coastal areas, around Stallingborough or off Immingham. In general, documented losses paint a vibrant picture of the types of voyages being undertaken within the Humber. The losses within 2km of the Project generally represent 19th and early 20th century vessels, consisting of two cargo vessels, three ketches, a keel and a trawler (Annex 6). This is representative of the historic finishing and trading in the area.

5.1.15 **Table 10** shows the distribution of these documented losses according to the date of loss for those records.

Table 10: Maritime recorded losses, summary by date

Date	Number of Records
Post-medieval	0
19th century	6
Modern	1
Unknown	0
Total	**7**

Overview of Archaeological Potential

5.1.16 There is potential for the presence of archaeological material of maritime nature spanning from the Mesolithic period to the present day within the study area. The key areas of potential are summarised in **Table 11** below, which have been based on the approach outlines in Section 3 above.

Table 11: Summary of key areas of maritime potential

Period	Summary
Pre-1500 AD	Low potential for material associated with prehistoric maritime activities. Prehistoric maritime activities include coastal travel, fishing and the exploitation of other marine and coastal resources. Vessels of this period include rafts, hide covered watercraft and log boats.
	Low potential for material associated with later prehistoric maritime activities, including seaworthy watercraft suitable for overseas voyages to facilitate trade and the exploitation of deep water resources. Such remains are likely to comprise larger boat types, including those representing new technologies such as the Bronze Age sewn plank boats which are associated with a growing scale of seafaring activities.
	Low potential for material of Romano-British date, associated with the expansion and diversification of trade with the Continent. Watercraft of this period, where present, may be representative of a distinct shipbuilding tradition known as 'Romano-Celtic' shipbuilding, often considered to represent a fusion of Roman and northern European methods.

Period	Summary
	Low potential for material associated with coastal and seafaring activity in the 'Dark Ages', associated with the renewed expansion of trade routes and Germanic and Norse invasion and migration. Vessels of this period may be representative of new shipbuilding traditions such as the technique.
	Low potential for material associated with medieval maritime activity, including that associated with increasing trade between the UK and Europe, the development of established ports around the southern North Sea and the expansion of fishing fleets and the herring industry. Vessels of this period are representative of a shipbuilding industry which encompassed a wide range of vessel types (comprising both larger ships and vernacular boats). Such wrecks may also be representative of new technologies (e.g. the use of flush-laid strakes in construction), developments in propulsion, the development of
1500 to 1815	Medium potential for post-medieval shipwrecks representative of continuing technological advances in the construction, fitting and arming of ships, and in navigation, sailing and steering techniques. Vessels of this period continued to variously represent both the clinker techniques and construction utilising the flush-laid strakes technique.
	Medium potential for post-medieval shipwrecks associated with the expansion of transoceanic communications and the opening up of the New World.
	Medium potential for post-medieval shipwrecks associated with the establishment of the Royal Navy during the Tudor period and the increasing scale of battles at sea.
	Medium potential for post-medieval shipwrecks associated with continuing local trade and marine exploitation including the transport of goods associated with the agricultural revolution.
1816 to 1913	Higher potential for the discovery of shipwrecks associated with the introduction of iron and later steel in shipbuilding techniques. Such vessels may also be representative of other fundamental changes associated with the industrial revolution, particularly with regards to propulsion and the emergence of steam propulsion and the increasing use of paddle and screw propelled vessels.
	Higher potential for the discovery of shipwrecks demonstrating a diverse array of vernacular boat types evolved for use in specific environments.
	Higher potential for wrecks associated with large scale worldwide trade, the fishing industry or coastal maritime activity including marine exploitation.
1914 to 1945	Higher potential for the discovery of shipwrecks associated with the two world wars including both naval vessels and merchant ships. Wrecks of this period may also be associated with the increased shipping responding to the demand to fulfil military requirements. A large number of vessels dating to this period were lost as a result of enemy action.
Post-1945	Potential for wrecks associated with a wide range of maritime activities, including military, commerce, fishing and leisure. Although ships and boats of this period are more numerous, loses decline due to increased safety coupled with the absence of any major hostilities. Vessels dating to this period are predominantly lost as a result of any number of isolated or interrelated factors including human error, adverse

Period	Summary
	weather conditions, collision with other vessels or navigational hazards or mechanical faults.

Maritime Archaeological Value

5.1.17 The present assessment of the value of known and potential archaeology within the study area is based on data from the UKHO, NRHE and the HER, and archaeological assessment of the geophysical survey data. This assessment is based on the criteria for appraising archaeological value, as set out in **Table 5**, and based on available guidance (Ref 1-17).

5.1.18 Each wreck should be assessed on a case-by-case basis, to consider the full range of criteria for appraising value (such as period, rarity, documentation, group value, survival/ condition, potential, build, use, loss, and investigation), however it is also possible to provide a broad assessment of the sites, based on date categories defined by the Marine Class Description and Principles of Selection (Ref 1-37).

5.1.19 As there is insufficient information to assess the value of each possible known wreck (**2003**, **2006** and **2008**) they should be assumed to be of high value, in accordance with the precautionary approach.

5.1.20 Due to the geophysical anomalies being located close to shore within a known currently busy and active area all the A2 anomalies have the potential to be modern debris, but without visual inspection this cannot be confirmed, and so all have been retained as a precaution. The A2_h anomalies are considered to have more potential to be archaeological in origin.

5.1.21 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, in accordance with the precautionary approach.

5.1.22 The other known features largely relate to 20th century port infrastructure. These features are of low archaeological value.

Aviation Archaeological Potential

5.1.23 Although there are currently no known aircraft crash sites located within the study area there is the potential for the discovery of previously unknown aircraft material, particularly in relation to Second World War.

5.1.24 A guidance note published by English Heritage (now Historic England) entitled Military Aircraft Crash Sites (Ref 1-14) outlined a case for recognising the importance of aircraft crash sites, specifically with regard to existing and planned development proposals which may have an impact on such sites. The guidance note argues that aircraft crash sites not only have significance for remembrance and commemoration, but also have an implicit cultural value as historic artefacts, providing information on the aircraft itself and also the circumstances of its loss (Ref 1-14, 2). All aircraft that crashed while in military service are automatically protected under the Protection of Military Remains Act 1986.

5.1.25 There is the potential for aircraft crash sites dating from the early 1900s to the present day. Early aircraft construction was characterised by lightweight aircraft, constructed of canvas covered wooden frames. These aircraft were extremely fragile and were known to break up mid-flight. The fragility of these airframes alongside the relative scarcity of flights over water mean that any aircraft remains dating to this period are rare.

5.1.26 The regular use of aircraft over the battlefields of the Western Front by the end of the First World War, however, prompted the mass-production of fixed wing aircraft in large numbers, spurring technological advances in aircraft design. A total of 28 fixed wing aircraft and 15 airships were lost by the German Imperial Air Service and Navy during the raids on the UK mainland during the First World War (Ref 1-38, 65) and a further 34 aircraft from the British Home Defence Squadrons are also recorded to have been lost during this period (Ref 1-27, 659). It is possible that some of these losses occurred at sea, particularly within regions that attracted intense aircraft hostility such as the East Coast.

5.1.27 During the interwar period, civil aviation increased significantly, with overseas services established to a number of European and worldwide destinations (Ref 1-38,16). The Department of Transport's Air Accident Investigation Branch (AAIB) records 20 civil aircraft losses at sea between 1920 and 1939, though this is not regarded as being a comprehensive record (Ref 1-38, 65). Technological advances in aircraft design during this period meant that the low-powered wood and cloth bi-planes of the early 20th century had been replaced by high-powered monoplanes made of aluminium by 1939 (Ref 1-38, 65).

5.1.28 During the Second World War, aircraft activity increased drastically and the highest potential for aircraft material on the seafloor is from this period. By the Second World War, aircraft were more heavily built and therefore material from their crash sites is more likely to survive in the archaeological record.

5.1.29 During the Second World War airpower became increasingly important at a strategic and operational level. Forming the frontier between the Allies and Axis, the North Sea became a significant focus for a high volume of aviation activity in the Second World War with hostile aircraft activity particularly concentrated off the east and south coasts of England (Ref 1-37,16). There are at least five airfields in the near vicinity of the Project that date to the Second World War, including RAF North Killingholme, RAF Kirmington, RAF Elsham Wolds, RAF Grimsby and RAF North Coastes. These combined both training and active airfields with corresponding levels of loss through accidents or battle damage both overland and on the journey to and from the European mainland.

5.1.30 The Aircraft Crash Sites at Sea project (Ref 1-36) considered a selection of sources which may be considered to indicate the potential for aircraft remains of this period to exist within the study area. One of the most complete sources of information was provided by published aviation researcher Ross McNeill, who identified 11,090 RAF aircraft losses in the North Atlantic, North Sea, English Channel, Irish Sea and Biscay areas between 1939 and 1990, the majority of which occurred during the Second World War (Ref 1-36,18).

5.1.31 After the Second World War, there is still potential for aircraft to have been lost in the area, however any military losses during this period are more likely to have been lost due to training accidents rather than combat operations (Ref 1-36, 66), and civilian losses are likely to have been reported and recorded.

Recorded Losses

5.1.32 The only recorded loss relating to an aircraft is a Halifax MK III, that ditched off Immingham in October 1944 (Annex 7).

Overview of Archaeological Potential

5.1.33 There is potential for the presence of aviation material dating from the early 20th century until more recent times, with a concentration dating to the World Wars and in particular to the Second World War. Discoveries may occur anywhere within the study area, but potential may increase nearer the coastlines in the vicinity of coastal defence networks protecting the strategically important military and civil infrastructure on England's east coast.

5.1.34 The key areas of aviation potential that may be uncovered within the study area are summarised in **Table 12**.

Table 12: Summary of key areas of aviation potential

Period	Summary
Pre-1939	Minimum potential for material associated with the early development of aircraft. Aircraft of this period may represent early construction techniques (e.g. those constructed of canvas covered wooden frames) or may be associated with the mass-production of fixed wing aircraft in large numbers during the First World War.
	Minimum potential for material associated with the development of civil aviation during the 1920s and 1930s, associated with the expansion of civilian flight from the UK to a number of European and worldwide destinations.
1939 to 1945	Very high potential for Second World War aviation remains, particularly as the east coast acted as a hub for hostile activity. Aircraft of this period are likely to be representative of technological innovations propelled by the necessities of war which extended the reliability and range of aircraft.
Post-1945	Potential for aviation remains associated with military activities dominated by the Cold War, the evolution of commercial travel and recreational flying and the intensification of offshore industry (including helicopter remains). Aircraft of this period may be representative of advances in aerospace engineering and the development of the jet engine.

Aviation Archaeological Value

5.1.35 The present assessment of the value of known and potential archaeology within the study area is based on data from the UKHO, NRHE and HER. This assessment is based on the criteria for assessing archaeological value as set out in Section 3 and within **Table 5**, and based on available guidance (Ref 1-39).

5.1.36 No remains of any aircraft are currently known to be located within the study area. Remains of aircraft which crashed while in military service are automatically protected under the Protection of Military Remains Act 1986. There were a significant number of airfields in the region during the Second World War, therefore it may be assumed that any aircraft material identified during future phases of the works will be of high value.

5.1.37 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.

6 Baseline Assessment: Intertidal Heritage Receptors

Introduction

6.1.1 No intertidal heritage receptors are located within the boundary of the Project and are all located within the buffer forming the study area.

6.1.2 A number of records recorded by the UKHO as obstructions relate to 20th century port infrastructure and are located largely within the intertidal zone (**2001**, **2002**, **2004**, **2005** and **2007**) (Annex 4). These obstructions, which appear to be made of concrete, are likely to be remnants of the 20th century reinforced concrete mooring Dolphins. These are a fixed structure dug into the seabed. A notice to mariners issued in 1983 draws attention to the debris deposited on the foreshore 'Mariners are advised that debris recovered from the demolished mooring dolphins at the Immingham Oil Terminal has been deposited on the foreshore above Low Water mark between the Fison's effluent outfall (situated approximately 800 metres downstream of the Immingham Tower 'A') and the root of the Immingham Oil Terminal jetty' (Notice to mariners H.108/1983).

6.1.3 The NELC HER lists the site of a First World War anti-submarine boom (**2009**). This is the westernmost of three such defences in the Humber and was known as the 'Inner Boom'. It consisted of a line of dolphins and nets in the water.

6.1.4 The Aerial Photography assessment did not identify any new or potential heritage assets in the intertidal zone. The majority of the aerial photographs were taken at high tide, or concentrated primarily on the terrestrial port, making identification of further assets difficult.

6.1.5 However, a series of vertical photographs taken in 1990 and 1992 and oblique photos taken in 1998 and 2006 did clearly show most of the octagonal and rectangular obstructions immediately adjacent to the port (**2001**, **2002**, **2004**, **2005**). Additionally, an area of discoloration in the foreshore between **2001**, **2002**, **2005** can be seen on two aerial photographs taken in 1990 (Sortie OS/90248 Frames 5 and 6). This can be interpreted as forming the approximate shape of a prow and could relate to wreck **2003.** However, the records of the size and shape for **2003** are unclear. It is not certain that the outline identified in these photos relates to the wreck or that they do not simply relate to natural patterns in the foreshore.

Value

6.1.6 The known intertidal features largely represent port infrastructure dating to the 20th century. These are likely to be of low-medium archaeological value.

6.1.7 Should anything remain of the First World War anti-submarine boom (**2009**), this would be of medium value.

6.1.8 Higher value features, such as wreck material, may be identified in the intertidal zone in the future.

7 Historic Seascape Character

Background

7.1.1 The Port of Immingham, also known in the past as Immingham Dock, is today a major port on the east coast of England, located on the south bank of the Humber Estuary west of Grimsby. The port was established by the Humber Commercial Railway and Dock Company in association with the Great Central Railway, and the works were permitted by the Humber Commercial Railway and Dock Act of 1904 (subsequently modified in 1908, 1909 and 1913). Construction began in 1906 and by 1912 the dock was completed, acting as a port for the export of coal from the Derbyshire and Yorkshire coalfields. The Port facilities linked with the railways which were present at Grimsby, run by the Great Central Railway (Ref 1-19).

7.1.2 During the first decade of the 20th century the shipbuilding industry dominated the coasts of the North East of England. After the First World War trade declined, as did demands for shipping services and new ships. The onset of rearmament before the Second World War helped to revive the industry for a while, but the shipping and shipbuilding industries were severely damaged by bombing during the war itself. Many shipyards needed extensive overhauling, as did numerous ports and inland waterways, and merchant fleets suffered heavy losses. Reconstruction after the Second World War fundamentally changed the traditional economic and transport patterns of the North Sea region. Nevertheless, coal and timber remained the most important North Sea cargoes well into the 1950s.

7.1.3 During the latter part of First World War and all through Second World War coastal convoys used the East Coast War Channels (Ref 1-18), coal being a major component of the cargoes carried, essential to help keep industries in southern Britain, particularly war industries, operational. The types of losses associated with the world wars include merchant vessels that might have sailed in the escorted convoys or sailed independently, lost to a variety of enemy threats including surface vessels, submarines, and mines. During the Second World War, there was a significant loss of aircraft along the east coast because of the relative proximity of German-held airfields on the other side of the North Sea. During both wars, large numbers of steam trawlers and drifters were bought or hired by the Admiralty to supplement the Royal Navy with significant losses due to enemy action. The most notable naval action within the region was probably the 1914 German raid on Scarborough, Whitby, and Hartlepool (Ref 1-30, 319–321).

7.1.4 During the First World War, the Port of Immingham was a submarine base for British D class submarines and was later used for cruise ships in the 1930s, accommodating vessels of the Orient Steam Navigation Company, White Star Line and Blue Star Line calling at the port. The Second World War saw further use for the Port, as a naval base and headquarters for the Royal Navy. In addition, a number of anti-aircraft batteries (heavy anti-aircraft battery Humber H21 & H22) were located around the dock during the war.

7.1.5 The dock was considerably expanded during the second half of the 20th century, with east and west jetties and the addition of several deep-water jetties for bulk cargo. The latter half of the century saw the construction of the Immingham Oil Terminal jetty on the banks of the Humber east of the dock entrance in 1969, and the Immingham Bulk Terminal commissioned in 1970 for the export of coal and import of steel constructed to the west of the dock entrance. In 1985 the Immingham Gas Jetty was opened, handling Liquid Petroleum Gas. Several extensions, terminals and roll-on/roll-off berths have been added during the 21st century, improving the port infrastructure and facilities to cater for the export of bulk goods.

Historic Seascape Characterisation

7.1.6 The National Historic Seascape Characterisation Consolidation Project assesses and defines areas with HSC types that promote an understanding of historic trends and processes, in so doing it informs the sustainable management of change over time (Ref 1-29). This is achieved by splitting the marine zone into five tiered levels: the coastal area, the sea surface, the pelagic character or water column, the benthic character or sea floor, and the sub-benthic character or subsea floor. It also records previous HSC characters in various time slices. The characterisation is GIS based, enabling key characteristics to be identified. The results of the characterisation of each level are summarised **Table 13**.

Table 13: Primary cultural processes in the study area

Zone	Broad Character Types	Character Sub-Types
Coastal and Conflated	Communications	Railways
	Cultural Topography	Mudflats
	Industry	Industrial production (unspecified)
		Hydrocarbon refinery
		Hydrocarbon pipeline
		Submarine power cable
	Ports and Docks	Working pier
	Navigation	Daymark
		Buoyage
		Hazardous water
		Navigation channel (active)
		Wreck Hazard

Zone	Broad Character Types	Character Sub-Types
Sea-Surface	Navigation	Buoyage
		Navigation route
		Navigation channel (active)
Water Column	Navigation	Buoyage
		Hazardous water
		Navigation channel (active)
	Fishing	Bottom trawling
		Fishing ground
Sea-floor	Cultural topography	Fine sediment plains
	Industry	Hydrocarbon pipeline
		Submarine power cable
	Navigation	Shoals and flats
		Wreck hazard
Sub-seafloor	Industry	Hydrocarbon pipeline
	Cultural topography	Fine sediment plains
Previous HSC Period	Cultural topography	Palaeolandscape component

7.1.7 In addition to the character descriptions, the study also identifies a probable palaeolandscape component in the Mesolithic (10,000 BC to 4,000 BC), as part of the land mass that bridged England with what is now mainland Europe.

8 Environmental Appraisal and Recommendations

High-level Environmental Appraisal

8.1.1 Archaeological receptors relating to maritime and intertidal archaeology have been identified within the vicinity of the Project, as has the potential for further receptors to be discovered, including palaeolandscape and aviation receptors. The Project has the potential to physically and adversely impact known and potential archaeological receptors within the construction footprint and area of effect of indirect physical effects such as changes in seabed sediment regimes, scour etc.

8.1.2 Mitigation measures are to be secured through a Written Scheme of Investigation (WSI). Recommendations for appropriate mitigation (both specific to identified impacts or general) are set out below.

Palaeogeographic features

8.1.3 Assessment of the geophysical data within the study area resulted in a total of four features of palaeogeographic interest. These are summarised as follows:

a. A total of one channel (**7502**) and two possible peat outcrops (**7501** and **7503**) were assigned a P1 archaeological rating.

b. One channel (**7500**) has been assigned a P2 archaeological rating.

8.1.4 As terrestrial features interpreted as being deposited during periods of likely human occupation, those features given a P1 archaeological rating are considered of high archaeological potential. The feature with a P2 discrimination is considered of medium archaeological potential due to the uncertainty of whether any fill of paleoenvironmental or archaeological interest remains.

8.1.5 Further geoarchaeological work is planned for the Project and a geoarchaeological work package is being developed, initially comprising a stage one assessment of the core logs which may develop into sampling, palaeoenvironmental analysis and dating work as appropriate. The assessment of this data would aid in refining the interpretation and therefore help determine the archaeological potential of the area.

Seabed features

8.1.6 The assessment of the geophysical data within the study area resulted in a total of 162 anomalies identified as being of possible archaeological interest. These are summarised as follows:

a. A total of 74 were assigned an A2_h archaeological rating.

b. A total of 88 were assigned an A2_l archaeological rating.

8.1.7 Due to these anomalies being located close to shore within a known currently busy and active port setting all the A2 anomalies have the potential to be modern debris, but without visual inspection this cannot be confirmed, and so all have been retained as a precaution.

8.1.8 For features assigned A2_h and A2_l archaeological discrimination rating, no AEZs are recommended at this time. Avoidance of impacts to these features is recommended in the first instance. Where this is not possible, it is recommended that, should any objects of archaeological potential be recovered during the proposed dredging programme, they be reported to the retained archaeological contractor via a pre-agreed reporting protocol.

General Recommendations

Avoidance

8.1.9 The primary mitigation for the protection of known archaeological receptors is avoidance. This is achieved through the implementation and monitoring of AEZs, which are proposed for identified high value seabed features of anthropogenic origin.

8.1.10 No AEZs are currently recommended.

8.1.11 Appropriately sized AEZs, should they be required due to future discoveries, are established around receptors which have been considered to be of high archaeological potential, in consultation with the Archaeological Curators. AEZs may be recommended in the future as further information is obtained. These areas would be out of bounds to installation and/or maintenance activities and to anchoring. Monitoring of any AEZs to ensure there is no disturbance to them will be part of this mitigation.

Reduction

8.1.12 Reduction of impact can be achieved by means of appropriate mitigation identified through potential opportunities for further investigation of receptors (e.g. during pre-installation surveys which may include visual survey methods and UXO assessment).

8.1.13 Further investigations would mean that anomalies can either have their archaeological value removed, if they prove to be of non-anthropogenic nature or modern, or their value as archaeological receptors confirmed. If their value is confirmed, mitigation in the form of either avoidance (which may be enacted by the implementation of an AEZ) or through remedying or offsetting measures as identified through a WSI which includes a Protocol for Archaeological Discoveries (Ref 1-34).

Remedying and Offsetting

8.1.14 In cases where avoidance is either inappropriate or impossible, the damage to archaeological receptors should be offset. In the case of seabed prehistoric receptors, this can be achieved by undertaking a palaeoenvironmental assessment of deposits with High geoarchaeological potential, principally peat deposits. Pollen and macrofossil assessment, supported by radiocarbon dating, will provide information on age and vegetation history of the terrestrial environment, providing a landscape context to any prehistoric activity within the area.

8.1.15 Recovery of artefacts and/or other archaeological receptors should be a final resort when all other mitigation has failed. Any recovery should be completed under the supervision of an appropriately qualified and experienced marine archaeologist. If required, recovery methods will be identified through a WSI. Due to the vast differences in practice and implementation between these methods, each will be covered by a specific Method Statement agreed in consultation with the Archaeological Curator, should be implemented.

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Annex 1: Terminology

Glossary

The terminology used in this assessment follows definitions contained within Annex 2 of NPPF:

Term	Description
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.
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).
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 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.
Significance (for heritage policy)	The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

Term	Description
Value	An aspect of worth or importance.

Chronology

Where referred to in the text, the main archaeological periods 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	00,000 – 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**	1900 – present day
Mesolithic	8500 – 4000 BCE		
Neolithic	4000 – 2400 BCE		
Bronze Age	2400 – 700 BCE		
Iron Age	700 BCE – AD 43		

Annex 2: Legislation, Policy and Guidance

Designation	Associated Legislation	Overview
World Heritage Sites	-	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 may nevertheless be of national importance and significant developments within a Conservation Area are referred to Historic England.
Scheduled Monuments and Areas of Archaeological Importance	Ancient Monuments and Archaeological Areas Act 1979	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
Listed Buildings	Planning (Listed Buildings and Conservation Areas) Act 1990	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.
Conservation Areas	Planning (Listed Buildings and Conservation Areas) Act 1990	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.

Designation	Associated Legislation	Overview
Registered Parks and Gardens and Registered Battlefields	National Heritage Act 1983	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 may nevertheless be of national importance and significant developments within a Conservation Area are referred to Historic England.
Protected Wreck Sites	Protection of Wrecks Act 1973	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
Protected Places and Controlled Sites	Protection of Military Remains Act 1986	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.

Other relevant legislation

Legislation	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 Areas Act 2009 (Marine Policy Statement 2011)	Marine licensing and marine planning made the responsibility of the 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 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.

Guidance

Policy	Overview
Marine Policy Statement 2011	The Marine Policy Statement was jointly published by all UK Administrations in March 2011 as part of a new system of marine planning being introduced across UK seas.
NPPF Section 12 Para. 128	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.
NPPF Section 12 Para.129	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 assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.
NPPF Section 12 Para. 132	When considering the impact of a Project on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. As heritage assets are irreplaceable, any harm or loss should require clear and convincing justification. Substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.
NPPF Section 12 Para. 135	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 affect directly or indirectly 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.
NPPF Section 12 Para. 137	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 or better reveal the significance of the asset should be treated favourably.

Policy	Overview
NPPF Section 12 Para. 139	Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.
NPPF Section 12 Para. 141	Local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require 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 the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.
National Policy Statement for Ports Section 5.12	The NPSfP recognises the importance of the historic environment and that the construction, operation and decommissioning of port infrastructure has the potential to result in adverse impacts on it. Therefore, the significance of heritage assets and the extent of the impact of the Project on the significance of any heritage assets has to be understood. Both designated heritage assets and undesignated heritage assets have to be considered, and the setting of a heritage asset also has to be taken into account.

Annex 3: Palaeogeographic features of archaeological potential

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Sensor
			From	To		
7500	Channel	P2	-	-	A possible channel identified in the MBES data cutting into a platform, interpreted as representing an area of outcropping peat (7501). Feature is oriented approximately south-west to north-east and is seen to gently meander, with some possible branches extending to the east and west. The exact extents of the feature are not always clearly definable, possibly due to erosion or the deposition of more recent sediments. Possibly related to channel feature 7502 identified in the SBP data.	MBES
7501	Peat Outcrop	P1	-	-	A platform identified in the MBES data covering the majority of the southern portion of the study area. The feature is interpreted as a possible area of outcropping peat, based on vibrocores taken nearby. The feature is seen to be intersected by a possible channel (7500), and numerous other depressions, possibly indicating areas where sediment has been eroded out. Although organic material was not definitively identified in the SBP data across this feature, several patches of seismic attenuation may indicate the presence of gas which may be caused by the microbial breakdown of organic material, or areas of sediment with high organic content at the surface. The feature possibly extends further to the east and likely formed part of a larger feature with 7503; however, the surface appears to be less regular in this area, suggesting some of the material is likely to have been eroded out, although the possibility of organic material of peat or organic material being present in this location remains. May extend further inshore, although it is not apparent in the MBES data, possibly due to overlying sediment.	MBES
7502	Channel	P1	0.5	6.8	A possible channel feature identified below a veneer of sediment, cutting into the interpreted till. The feature appears to have acoustically chaotic fill. The basal reflector is not always clearly distinguishable, which means that there is low confidence is the exact depth and extents of the feature. The feature is orientated approximately south-west to north-east and corresponds in part with an overlying channel feature (7500) identified in	SBP

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Sensor
			From	To		
					the MBES data and may represent an earlier phase of channelling or may be the same phase of channelling but with some of the infill material preserved.	
7503	Peat Outcrop	P1	-	-	A small section of platform identified in the MBES data in the south-east corner of the study area. The feature is interpreted as a possible area of outcropping peat, based on vibrocores taken nearby. The feature is seen to continue beyond the study area further to the east. Although organic material was not definitively identified in the SBP data across this feature, several patches of seismic attenuation identified across the site may indicate the presence of gas which may be caused by the microbial breakdown of organic material, or areas of sediment with high organic content at the surface. The feature possibly extends further to the west and likely formed part of a larger feature with 7501; however, the surface appears to be less regular in this area, suggesting some of the material is likely to have been eroded out, although the possibility of organic material of peat or organic material being present in this location remains.	MBES

Annex 4: Known shipwrecks and obstructions on the seabed within the study area

ID	External References	Type	Description	BNG Easting	BNG Northing
2001	UKHO 65126	Obstruction	Octagonal obstruction shown on aerial photography	520765	415966
2002	UKHO 65127	Obstruction	Octagonal obstruction shown on aerial photography	520788	416015
2003	UKHO 8576; HER NML1473; NRHE 908340	Wreck	Possible remains of craft recorded between 1991 and 1999. No details are known and it was listed as dead in 2004	520808	415999
2004	UKHO 65124	Obstruction	Rectangular obstruction shown on aerial photography	520823	415903
2005	UKHO 65128	Obstruction	Octagonal obstruction shown on aerial photography	520826	415994
2006	UKHO 73629	Wreck	Shown on Humber 8, April 2009 Edition.	520832	416009
2007	UKHO 65125	Obstruction	Cigar shaped obstruction shown on aerial photography	520833	415905
2008	UKHO 8507; HER NML1476; NRHE 907859	Wreck	The HVITVEIS. A Norwegian schooner, built in 1915, which foundered following a collision with the Danish registered SS Ulla en route from Goole to Rouen with a cargo of coal.	522073	416696
2009	HER MNL4434	Anti-submarine defence	Site of World War 1 anti-submarine defences, off Stallingborough Haven. This is the westernmost of three in the Humber, known as the 'Inner Boom'. This consisted of a line of dolphins and nets in the water.	Polygon	

Annex 5: Seabed features of archaeological potential

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7000	Dark reflector	521269	415617	A2_l	1.8	0.6	0.1	-	An indistinct, angular dark reflector with a shadow, almost 'Z' shaped object. Visible in the MBES dataset a small mound in a depression. No anomalous features were identified in the Mag. data at this location. Interpreted as possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7001	Debris field	521303	415639	A2_h	12.1	3.2	0.1	-	A spread of distinct dark reflectors, comprising a linear dark reflector that becomes intermittent at the western end (measuring 7.6 x 0.5 m). There are smaller angular objects with shadows at the western extent of the feature. Visible in the MBES dataset a small cluster of angular mounds. No anomalous features were identified in the Mag. data at this location. Interpreted as a possible non-ferrous debris field.	SSS Mosaic, MBES	-
7002	Linear debris	521361	415692	A2_h	51.1	0.2	0.1	-	A long thin and slightly curvilinear intermittent dark reflector with a shadow in parts. Visible in the MBES dataset a curvilinear mound orientated approximately east to west. No anomalous features were identified in the Mag. data at this location. Interpreted as linear debris and may be a length of non-ferrous rope or chain.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7003	Dark reflector	521371	415664	A2_l	1.2	0.9	0.2	-	A rounded, indistinct dark reflector with a shadow, the object appears hollow. Visible in the MBES dataset a small mound. No anomalous features were identified in the Mag. data at this location. Interpreted as possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7004	Magnetic	521445	415515	A2_l	-	-	-	26	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7005	Debris field	521437	415561	A2_h	8.6	7.8	0.6	-	A group of angular and sub-angular dark reflectors, some with shadows. Visible in the MBES dataset a small cluster of linear and rounded mounds. No anomalous features were identified in the Mag. data at this location, though the large magnetic response associated with the modern infrastructure to the west is likely to mask any smaller responses from this feature. Interpreted as a possible debris field.	SSS Mosaic, MBES	-
7006	Debris field	521454	415604	A2_h	13.8	3.4	0.5	-	A distinct spread of angular dark reflectors with shadows. The largest object measures 2.0 x 1.0 m. Visible in the MBES dataset a cluster of small mounds. No anomalous features were identified in the Mag. data at this location, though the large magnetic response associated with the modern infrastructure to the south-west is likely to mask any smaller responses from this	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									feature. Interpreted as a possible debris field.		
7007	Dark reflector	521477	415585	A2_l	1.1	0.5	0.2	-	A distinct, sub-rounded dark reflector with a very bright shadow. Visible in the MBES dataset a small mound. No anomalous features were identified in the Mag. data at this location. Interpreted as possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7008	Linear debris	521529	415573	A2_h	67.2	0.2	0.1	-	A long thin and curvilinear dark reflector with a shadow in parts. Visible in the MBES dataset an intermittent curvilinear mound, orientated east to west. No anomalous features were identified in the Mag. data at this location. Interpreted as linear debris and may be a length of non-ferrous rope or chain.	SSS Mosaic, MBES	-
7009	Debris	521553	415577	A2_h	5.1	2.6	0.1	-	A distinct item of debris visible as two parallel linear dark reflectors with an internal shadow, smaller dark reflectors are visible and attached to the southern object. Visible in the MBES dataset a distinct linear mound. No anomalous features were identified in the Mag. data at this location. Interpreted as possible non-ferrous debris.	SSS Mosaic, MBES	-
7010	Seabed disturbance	521527	415508	A2_l	5.1	0.9	0.1	-	An irregular area of seabed disturbance with indistinct curvilinear dark reflectors within, some with slight shadows. Visible in the MBES dataset an uneven area of seabed. No anomalous features were identified in the Mag. data at this location. Interpreted as possible natural feature or may be possible non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7011	Dark reflector	521552	415533	A2_l	2.0	0.4	0.2	-	A distinct, irregular and slightly elongate dark reflector with a straight shadow. Visible in the MBES dataset a small mound. Possibly associated with rope or chain **7013** situated 1.0 m north. No anomalous features were identified in the Mag. data at this location. Interpreted as possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7012	Dark reflector	521536	415509	A2_l	1.6	0.2	-	-	An indistinct curvilinear dark reflector with a slight shadow. The feature may extend to the north from the western end, but is indistinct. No anomalous features were identified in the MBES or Mag. data at this location. Interpreted as possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7013	Linear debris	521605	415541	A2_h	184.9	0.2	0.1	-	A very long, thin and slightly curvilinear dark reflector with a shadow in parts, orientated approximately east to west. Visible on the MBES dataset as a long, intermittent slightly curvilinear mound. No anomalous features were identified in the Mag. data at this location. Interpreted as linear debris and may be a length of non-ferrous rope or chain.	SSS Mosaic, MBES	-
7014	Linear debris	521760	415587	A2_h	53.7	0.2	0.1	-	A long thin and slightly curvilinear dark reflector with a shadow in places, appears to have objects attached on the south-east extent, the largest of which measures 1.4 x 0.5 m. Faintly visible on the MBES dataset as an indistinct mound. No anomalous features were identified in the Mag. data at this location. Interpreted as linear debris	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									and may be a length of non-ferrous rope or chain, or possible fishing gear.		
7015	Debris	521673	415622	A2_h	3.1	2.9	0.6	22	A distinct rounded dark reflector with shadow that appears hollow. Visible as a distinct, elongate mound in the MBES data. Associated with a small negative monopole with peak and trough on one profile line in the Mag. dataset. Interpreted as ferrous debris.	SSS Mosaic, MBES, Mag.	-
7016	Debris field	521471	415626	A2_h	27.5	16.0	0.6	37	A debris field numerous groups of small angular dark reflectors. A distinct, slightly curvilinear dark reflector with a dark reflector attached at the north-western end measuring 2.2 x 0.8 m is visible in the southern extent, that may be a rope or chain with an anchor attached. Visible in the MBES dataset as multiple linear and angular mounds, the largest mound is situated at the north-western extent of the feature and measures 2.6 x 1.7 m. Associated with a small positive monopole with peak and trough on one profile line in the Mag. data. Interpreted as a ferrous debris field.	SSS Mosaic, MBES, Mag.	-
7017	Debris	521429	415646	A2_h	15.4	0.1	0.1	-	A long and thick dark reflector that is slightly right angled in the centre. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. data at this location. Interpreted as non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7018	Magnetic	521511	415660	A2_l	-	-	-	38	A small positive monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7019	Debris field	521510	415668	A2_h	8.1	2.6	0.5	-	A spread of angular dark reflectors. The western-most feature is very distinct, and measures 2.8 x 1.1 m. The south-east features are indistinct with shadows, and situated in a depression. Visible in the MBES dataset as a cluster of angular mounds. Situated 6.0 m north of Mag. anomaly **7018** and may be associated. Interpreted as possible debris.	SSS Mosaic, MBES	-
7020	Magnetic	521501	415680	A2_l	-	-	-	66	A medium, sharp positive monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7021	Magnetic area	521523	415747	A2_l	79.0	73.0	-	6821	A magnetic area comprising multiple magnetic responses over multiple profiles. The largest Mag. anomaly is a very large, sharp asymmetric dipole with peak and trough on one profile line. The area overlies a distinct linear mound 49 m long in the MBES data interpreted to be modern and may be associated, however given the extents of this response it has been retained as a precaution. Interpreted as possible ferrous debris that may be modern.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7022	Dark reflector	521436	415760	A2_l	3.5	0.1	-	-	A long, thin and straight dark reflector with a shadow. No anomalous features were identified in the MBES or Mag. data at this location. Interpreted as possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7023	Debris field	521485	415797	A2_h	48.6	42.1	0.2	-	A spread of dark reflectors visible as curvilinear, angular and sub-angular objects. Visible on the MBES dataset as a large area of angular and linear mounds. The average sized object measures 2.0 x 1.8 m. No anomalous features were identified in the Mag. data at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7024	Dark reflector	521580	415877	A2_l	2.0	0.2	0.1	-	A thin, elongate dark reflector with a bright shadow. Visible on the MBES dataset as a small, elongate mound. No anomalous features were identified in the Mag. data at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7025	Dark reflector	521525	415824	A2_l	3.8	0.1	-	-	A linear dark reflector with a slight shadow. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7026	Dark reflector	521574	415847	A2_l	3.0	1.3	0.1	-	A distinct angular dark reflector, with a thin curvilinear dark reflector on the north-western end. Visible in the MBES dataset as a small angular mound. No anomalous features were identified in the Mag. data at this location. Interpreted as a possible	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									natural feature or possible non-ferrous debris.		
7027	Dark reflector	521540	415829	A2_l	1.4	0.6	-	-	A distinct, angular dark reflector with a shadow. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7028	Dark reflector	521529	415820	A2_l	1.1	0.1	-	-	A linear dark reflector with no shadow. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7029	Debris field	521586	415838	A2_h	4.8	2.6	-0.1	-	An almost rectangular area of distinct dark reflectors, some with shadows. Visible on the MBES dataset as an uneven area of seabed. No anomalous features were identified in the Mag. data at this location. Interpreted as a possible non-ferrous debris field.	SSS Mosaic, MBES	-
7030	Debris field	521598	415825	A2_h	16.4	5.9	0.1	-	A spread of curvilinear dark reflectors with shadows. Visible in the MBES dataset as a series of angular and curvilinear mounds. No anomalous features were identified in the Mag. data at this location. Interpreted as a possible non-ferrous debris field.	SSS Mosaic, MBES	-
7031	Linear debris	521600	415718	A2_h	109.8	2.9	0.1	-	A long curvilinear dark reflector possibly snagged on a clearly modern very distinct linear dark reflector at its north-west end. Visible on the MBES dataset as a curvilinear mound. No anomalous features	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									were identified in the Mag. data at this location; however this feature is situated within a large area of magnetic responses (**7021**) that may be masking any smaller individual magnetic responses from ferrous material within this area. Interpreted as linear debris and may be a long length of rope or chain or possible fishing gear.		
7032	Debris field	521576	415712	A2_h	20.3	18.5	0.1	-	A spread of curvilinear dark reflectors, some with shadows. Visible on the MBES dataset as a sinuous curvilinear mound. No anomalous features were identified in the Mag. data at this location; however this feature is situated within a large area of magnetic responses (**7021**) that may be masking any smaller individual magnetic responses from ferrous material within this area. Interpreted as a possible debris field.	SSS Mosaic, MBES	-
7033	Magnetic	521650	415722	A2_l	-	-	-	11	A small, broad asymmetric dipole with peak and trough on one profile line, located within large debris field **7034** and may be associated. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7034	Debris field	521671	415755	A2_h	225.0	131.0	0.3	-	A large debris field comprising numerous linear, curvilinear, angular and sub-angular dark reflectors, areas of seabed disturbance and compact debris fields. Visible on the MBES dataset as groups and individual linear, curvilinear and angular mounds. One magnetic anomaly, **7033**, is located within	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									the debris field extents. Interpreted as a large spread of debris and debris fields.		
7035	Seabed disturbance	521666	415700	A2_l	8.7	2.5	0.1	-	An area of indistinct, elongate dark reflectors within an area of natural depression. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7036	Linear debris	521731	415694	A2_h	77.2	0.2	0.1	-	A long, thin and in places intermittent curvilinear dark reflector. Visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a long length of rope or chain.	SSS Mosaic, MBES	-
7037	Debris field	521774	415705	A2_h	15.0	3.2	0.2	-	An elongate alignment of dark reflectors orientated approximately north to south. The feature is indistinct in places. Faintly visible in the MBES dataset as a slightly curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7038	Dark reflector	521791	415690	A2_l	6.2	0.8	0.1	-	An indistinct linear dark reflector with no clear shadow. This may be multiple small aligned objects. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7039	Debris field	521799	415676	A2_h	21.1	6.4	0.1	-	A distinct dark reflector comprising three linear sections at the north-west end, may be multiple objects. The central features have slight shadows. Visible on the MBES dataset as a series of linear mounds. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7040	Debris field	521818	415672	A2_h	23.6	9.0	0.3	-	A large spread of linear, curvilinear and angular dark reflectors, some with shadows, situated on an uneven area of seabed. The largest object measures 8.4 x 1.5 m. Visible on the MBES dataset as a cluster of angular, sub-angular and linear mounds. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7041	Debris	521834	415687	A2_h	8.6	0.2	0.1	-	A long thin and straight dark reflector with no clear shadow. Visible in the MBES dataset as a distinct linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous debris.	SSS Mosaic, MBES	-
7042	Dark reflector	521833	415705	A2_l	2.8	0.6	0.1	-	An indistinct, slightly curvilinear dark reflector with a shadow. Visible in the MBES dataset as a small mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7043	Debris	521839	415707	A2_h	11.7	0.2	0.1	-	A long, thin and straight dark reflector with a shadow. Visible on the MBES dataset as a segmented linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous debris.	SSS Mosaic, MBES	-
7044	Dark reflector	521986	415690	A2_l	1.9	0.2	0.1	-	A slightly curvilinear dark reflector with a bright shadow, may continue further to the west however this is unclear in the data. Visible on the MBES dataset as a small mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7045	Magnetic	522025	415734	A2_l	-	-	-	32	A small symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7046	Magnetic	522031	415747	A2_l	-	-	-	27	A small negative monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7047	Debris field	521888	415750	A2_h	4.7	3.8	0.3	40	A small spread of dark reflectors with shadows. Visible in the MBES dataset as a cluster of rounded mounds. Associated with a small asymmetric dipole with peak and trough on one profile line in the Mag. dataset. Interpreted as ferrous debris.	SSS Mosaic, MBES, Mag.	-
7048	Magnetic	521848	415796	A2_l	-	-	-	50	A medium asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7049	Debris field	521832	415762	A2_h	93.2	68.1	0.3	-	A large debris field comprising numerous linear, curvilinear, angular and sub-angular dark reflectors and compact debris fields. Visible in the MBES dataset as an area of mainly linear mounds. No anomalous features were identified in the Mag. data at this location. Interpreted as a large spread of non-ferrous debris and debris fields.	SSS Mosaic, MBES	-
7050	Linear debris	521811	415846	A2_h	79.4	0.2	0.2	2939	A long, thin and slightly curvilinear dark reflector with a shadow in places, which appears to have small angular dark reflectors attached at northern end, measuring approximately 0.5 x 0.5 m. Faintly visible in the MBES dataset as a curvilinear mound. Associated with multiple Mag. anomalies across its extent, the largest is a very large, sharp asymmetric dipole with peak and trough on one profile line. Also visible on adjacent profiles. Interpreted as ferrous linear debris.	SSS Mosaic, MBES, Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7051	Magnetic	521795	415872	A2_h	-	-	-	144	A large, sharp asymmetric dipole with peak and trough over two profile lines. Also visible on adjacent profiles. No anomalous features were identified in the SSS or MBES data at this location. May be associated with linear debris **7050** situated 8.0 m south-east. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7052	Dark reflector	521741	415862	A2_l	3.0	1.0	0.2	-	An elongate, indistinct dark reflector with a bright shadow. Visible as an elongate mound in the MBES data. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or non-ferrous debris.	SSS Mosaic, MBES	-
7053	Debris field	521737	415849	A2_h	25.9	7.0	0.2	24	An elongate spread of possible debris visible as angular and sub-angular dark reflectors, some with shadows. Visible on the MBES dataset as a cluster of angular mounds. Associated with a small asymmetric dipole with peak and trough on one profile line in the Mag. data. Interpreted as a ferrous debris field.	SSS Mosaic, MBES, Mag.	-
7054	Debris field	521722	415854	A2_h	11.5	8.2	0.2	-	A spread of angular and linear dark reflectors with shadows. Visible as a distinct group of mounds in the MBES data. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7055	Debris	521703	415838	A2_h	6.0	0.3	0.1	-	A curvilinear dark reflector with a rounded object at its western end. Visible as a curvilinear mound in a large depression in the MBES data. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous debris.	SSS Mosaic, MBES	-
7056	Magnetic	521695	415877	A2_l	-	-	-	77	A medium, sharp asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7057	Magnetic	521671	415868	A2_h	-	-	-	169	A large, sharp asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7058	Linear debris	521646	415874	A2_h	65.6	0.2	0.1	-	A long, thin linear dark reflector with a shadow in places. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic	-
7059	Debris field	521621	415878	A2_h	50.8	29.0	0.2	-	A spread of debris visible as linear, curvilinear and angular dark reflectors, some with shadows. Visible in the MBES dataset as an area of angular and linear mounds, the largest object measures 3.2 x 3.0 m. No anomalous features were identified in the Mag. dataset at this	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									location. Interpreted as a non-ferrous debris field.		
7060	Linear debris	521662	415913	A2_h	16.2	0.1	-	-	A thin, 'V' shaped, linear dark reflector. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as non-ferrous linear debris.	SSS Mosaic	-
7061	Linear debris	521645	415923	A2_h	12.4	0.2	-	-	A distinct slightly curvilinear dark reflector that may have small angular objects attached along its length, but are very indistinct. The feature extends beyond the study area. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic	-
7062	Dark reflector	521693	415953	A2_l	5.3	0.1	-	-	A straight dark reflector with a slight shadow. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as a possible natural feature or non-ferrous debris.	SSS Mosaic	-
7063	Debris field	521724	415970	A2_h	19.5	5.9	0.3	-	A group of distinct linear, angular and sub-angular dark reflectors with shadows. At the south-eastern end of the feature is a distinct and anomalous oval shaped dark reflector, with intern variable reflectivity. Visible on the MBES dataset as a cluster of angular mounds and depression with small mounds within. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7064	Magnetic	521742	415987	A2_h	-	-	-	745	A very large, sharp asymmetric dipole with peak and trough on one profile line. Also visible on adjacent profiles. Possibly associated with linear debris **7066** 13.0 m to the south-east. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7065	Debris field	521814	415991	A2_h	112.5	23.4	0.5	-	An area of multiple south-east north-west orientated very long curvilinear dark reflectors with shadows, alongside some smaller linear dark reflectors. Visible in the MBES as a series of small and elongate curvilinear, sub-angular and angular mounds. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7066	Linear debris	521768	415928	A2_h	102.4	0.2	0.1	108	A long, curvilinear dark reflector in a Y-shape, which branches at the northern end. There are small possible angular objects at the north-west end measuring approximately 1.3 x 1.0 m. Visible on the MBES dataset as a curvilinear, intermittent mound. Associated with two Mag. anomalies at the north-west end, the largest of which is a large, sharp asymmetric dipole with peak and trough on one profile line. Interpreted as partially ferrous linear debris and may be fishing gear.	SSS Mosaic, MBES, Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7067	Debris field	521744	415913	A2_h	14.0	4.4	0.1	-	A compact group of small linear and angular dark reflectors. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7068	Dark reflector	521752	415903	A2_l	2.2	1.6	0.3	-	An angular dark reflector with a slightly irregular shadow. Visible on the MBES dataset as a small, angular mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7069	Dark reflector	521758	415903	A2_l	2.9	0.6	0.2	-	An angular dark reflector with a slightly irregular shadow. Visible on the MBES dataset as a small mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7070	Mound	521764	415887	A2_l	13.7	0.2	0.1	-	A long, thin and slightly curvilinear mound. No anomalous features were identified in the SSS Mosaic or Mag. dataset at this location. Interpreted as a possible natural feature or non-ferrous debris .	MBES	-
7071	Magnetic	521815	415898	A2_l	-	-	-	17	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7072	Debris field	521917	415920	A2_h	6.4	4.0	0.6	-	An indistinct but irregular and anomalous cluster of dark reflectors. This feature is more prominent in the MBES dataset, consisting of a prominent cluster of irregular mounds. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7073	Magnetic	521947	415891	A2_l	-	-	-	8	A small, broad symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7074	Linear debris	522047	415837	A2_h	38.0	0.2	0.1	-	An indistinct slightly curvilinear dark reflector, the southern extent is indistinct but has some possible small angular dark reflectors associated, the average object measures 0.7 x 0.6 m. Possibly associated with dark reflector **7095** situated 2.0 m north of the north-east end. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be fishing gear.	SSS Mosaic, MBES	-
7075	Dark reflector	522043	415794	A2_l	1.4	0.8	0.1	-	A distinct hollow dark reflector in a depression. Visible on the MBES dataset as a small mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7076	Dark reflector	522083	415767	A2_l	1.1	0.6	0.1	7	A small sub-angular dark reflector in a depression. Visible on the MBES dataset as a small mound. Associated with a small negative monopole with peak and trough on one profile line on the Mag. dataset. Interpreted as a possible natural feature with some ferrous content or possible ferrous debris.	SSS Mosaic, MBES, Mag.	-
7077	Debris field	522095	415762	A2_h	7.6	2.6	0.1	-	A small group of dark reflectors including a linear dark reflector at the western end. Visible on the MBES dataset as indistinct small angular mounds and depressions. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a non-ferrous debris field.	SSS Mosaic, MBES	-
7078	Dark reflector	522107	415763	A2_l	2.8	0.2	-	-	A long, thin linear dark reflector with a shadow. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7079	Dark reflector	522113	415764	A2_l	2.5	0.2	-	-	A long, thin linear dark reflector with a shadow. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7080	Dark reflector	522112	415761	A2_l	3.7	0.2	-	-	A long, thin linear dark reflector with a shadow. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7081	Debris	522170	415784	A2_h	2.5	1.4	0.7	-	A distinct rectangular mound with steep sides. No anomalous features were identified in the SSS Mosaic or Mag. datasets at this location. Interpreted as possible non-ferrous debris.	MBES	-
7082	Debris	522099	415815	A2_h	8.0	0.1	0.1	-	An indistinct linear dark reflector with a shadow. Visible in the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as possible non-ferrous debris.	SSS Mosaic, MBES	-
7083	Dark reflector	522095	415815	A2_l	2.0	0.1	0.1	-	A short, straight linear dark reflector with a bright shadow. Visible on the MBES dataset as an indistinct linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7084	Debris	522094	415830	A2_h	16.7	0.1	0.1	-	An indistinct 'V' shaped dark reflector with a sub-angular object at the northern end measuring 1.8 x 1.0 m. Also visible in MBES data as linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7085	Dark reflector	522124	415865	A2_l	3.1	0.1	-	-	A thin and straight dark reflector with a slight shadow. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7086	Dark reflector	522231	415838	A2_l	13.0	0.2	0.1	-	A very distinct curvilinear dark reflector. Visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7088	Magnetic	522221	415850	A2_l	-	-	-	48	A small asymmetric dipole with peak and trough on one profile line. One of a number of Mag. anomalies in this area that may be related (**7089**, **7090**, **7091**). No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7089	Magnetic	522196	415859	A2_l	-	-	-	49	A small asymmetric dipole with peak and trough on one profile line. One of a number of Mag. anomalies in this area that may be related (**7090**, **7088**, **7091**). No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7090	Magnetic	522223	415824	A2_l	-	-	-	53	A medium asymmetric dipole with peak and trough on one profile line. One of a number of Mag. anomalies in this area that may be related (**7088**, **7089**, **7091**). No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7091	Magnetic	522193	415878	A2_l	-	-	-	46	A small negative monopole with peak and trough on one profile line. One of a number of Mag. anomalies in this area that may be related (**7090**, **7088**, **7089**). No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7092	Debris	522171	415882	A2_h	9.0	0.1	0.2	-	An indistinct, right-angled linear dark reflector with a short shadow. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris.	SSS Mosaic, MBES	-
7093	Dark reflector	522122	415872	A2_l	5.5	0.2	0.1	-	A short slightly curvilinear dark reflector with shadow. Visible in the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7094	Linear debris	522107	415906	A2_h	14.8	0.2	0.1	-	Indistinct, thin curvilinear dark reflector. Also visible as a mound in the MBES data. No anomalous features were identified in the Mag. dataset at this location. Interpreted as possible non-ferrous linear debris.	SSS Mosaic, MBES	-
7095	Dark reflector	522060	415852	A2_l	1.5	0.4	0.2	-	A distinct, elongate dark reflector with a bright shadow. Visible on the MBES dataset as a small mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7096	Bright reflector	522054	415868	A2_l	4.0	1.2	0.0	-	A distinct elongate and slightly irregularly-shaped bright reflector. No anomalous features were identified in the MBES or Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic	-
7097	Magnetic	522050	415917	A2_l	-	-	-	10	A small negative monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7098	Linear debris	522024	415896	A2_h	57.7	0.2	0.1	-	A long, thin and slightly curvilinear dark reflector with a bright shadow. Also visible in the MBES data as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7099	Linear debris	522011	415954	A2_h	26.1	0.4	0.1	-	A long, curvilinear dark reflector with a short shadow. Also visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic, MBES	-
7100	Debris	522029	415987	A2_h	4.0	0.5	0.1	-	A short, straight, linear dark reflector with a short shadow. Also visible on the MBES dataset as an elongate mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris.	SSS Mosaic, MBES	-
7101	Debris field	522018	416067	A2_h	96.0	0.7	0.2	94	A long, intermittent curvilinear dark reflector with a short shadow. This feature is possibly broken up or partially buried and has an angular object at the south-east end measuring 1.8 x 0.5 m. The feature is visible on the MBES as an intermittent linear mound. Associated with two Mag. anomalies at either end, a small positive monopole with peak and trough on one profile line in the Mag. data at the south-east end measuring 38 nT and a medium, sharp asymmetric dipole with peak and trough over two profile lines at the north-west end. Interpreted as partially ferrous debris field with an object at the south-east end that may be an anchor.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7102	Debris	522011	416046	A2_h	7.7	0.3	0.1	-	A short, curvilinear dark reflector with a short shadow. Also visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris.	SSS Mosaic, MBES	-
7103	Linear debris	521988	416050	A2_h	20.3	0.4	0.1	-	A long, straight dark reflector with a short shadow. Also visible on the MBES as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic, MBES	-
7104	Magnetic	521963	416039	A2_l	-	-	-	20	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7105	Magnetic	521913	415984	A2_l	-	-	-	65	A medium asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7106	Debris field	521851	415990	A2_h	12.1	11.4	0.3	-	A cluster of straight and curved linear and rounded mounds, which is most prominent in the south-west corner. This feature is very indistinct in the SSS dataset and consists of a slightly irregular area of seabed. No anomalous features were identified in the Mag. dataset at this	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									location. Interpreted as a possible non-ferrous debris field.		
7107	Magnetic	521946	416103	A2_l	-	-	-	18	A small, broad positive monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7108	Magnetic	521945	416092	A2_l	-	-	-	13	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7109	Magnetic	522005	416116	A2_l	-	-	-	26	A small symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7110	Linear debris	522066	416152	A2_h	13.2	0.3	0.1	-	A long, curvilinear dark reflector with a short shadow. Also visible in the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a rope or chain.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7111	Magnetic	522177	416121	A2_l	-	-	-	13	A small, broad positive monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7112	Magnetic	522135	416074	A2_l	-	-	-	11	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7113	Magnetic	522167	416090	A2_h	-	-	-	101	A large asymmetric dipole with peak and trough on one profile line. Also visible on adjacent profile. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7114	Debris field	522203	416095	A2_h	8.7	3.1	-	149	A cluster of highly curvilinear dark reflectors with shadows, and multiple additional reflectors including two clear rectangular features with shadows. These features are not clearly visible in the MBES dataset. Associated with a large, sharp asymmetric dipole with peak and trough on one profile line in the Mag. dataset. Interpreted as a ferrous debris field.	SSS Mosaic, Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7115	Linear debris	522186	416071	A2_h	24.8	0.1	-	-	A long, curvilinear dark reflector with a short shadow, orientated approximately north-west to south-east. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as non-ferrous linear debris and may be a rope or chain.	SSS Mosaic	-
7116	Magnetic	522222	416084	A2_l	-	-	-	17	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7117	Debris	522199	415993	A2_h	7.3	0.3	0.1	-	A short, straight, linear dark reflector with a short shadow. Also visible in the MBES dataset as an elongate mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous debris.	SSS Mosaic, MBES	-
7118	Magnetic	522198	415974	A2_l	-	-	-	27	A small, broad symmetric dipole with peak and trough over two profile lines. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7119	Magnetic	522278	415998	A2_l	-	-	-	32	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7120	Magnetic	522274	415953	A2_l	-	-	-	15	A small, broad symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7121	Magnetic	522321	415940	A2_l	-	-	-	19	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7122	Linear debris	522264	415863	A2_h	18.7	0.2	0.1	-	A very distinct, slightly curvilinear dark reflector with no shadow. Visible on the MBES dataset as an elongate mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a rope or chain.	SSS Mosaic, MBES	-
7123	Dark reflector	522292	415842	A2_l	16.8	0.2	0.1	-	A very distinct, slightly curvilinear dark reflector. Visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7124	Magnetic	522315	415830	A2_l	-	-	-	14	A small negative monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7125	Dark reflector	522560	415837	A2_l	6.1	0.2	0.1	-	A long, thin and slightly curvilinear dark reflector. Visible on the MBES dataset as a linear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-
7126	Debris field	522576	415866	A2_h	13.2	7.0	0.4	-	A compact group of elongate mounds in the MBES data, which appears anomalous in a very uneven area of seabed. Visible as indistinct linear and sub-angular dark reflectors in the SSS mosaic. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris field.	SSS Mosaic, MBES	-
7127	Debris field	522538	415855	A2_h	27.5	11.5	0.6	-	A spread of dark reflectors visible as curvilinear, angular and sub-angular objects. Visible on the MBES dataset as a group of angular and linear mounds. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris field.	SSS Mosaic, MBES	-
7128	Magnetic	522395	415906	A2_l	-	-	-	31	A small, sharp asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7129	Magnetic	522414	415911	A2_I	-	-	-	38	A small, sharp asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7130	Magnetic	522403	415943	A2_I	-	-	-	29	A small asymmetric dipole with peak and trough over two profile lines. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7131	Mound	522465	415924	A2_I	5.4	1.6	0.2	-	A straight, elongate mound which is oriented south-east to north-west, and may be a linear feature curved back on itself. No anomalous features were identified in the SSS Mosaic or Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	MBES	-
7132	Dark reflector	522469	415928	A2_I	3.8	2.5	0.1	-	A slightly indistinct, irregular dark reflector which is slightly elongate. Visible on the MBES dataset as an angular mound with a central depression. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7133	Mound	522472	415965	A2_l	3.7	3.6	0.2	-	A rounded, prominent mound surrounded by scour. No anomalous features were identified in the SSS Mosaic or Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	MBES	-
7134	Magnetic	522487	415979	A2_l	-	-	-	36	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7135	Linear debris	522535	415983	A2_h	27.6	0.3	-	-	A long, curvilinear dark reflector with a short shadow. No anomalous features were identified in the MBES or Mag. datasets at this location. Interpreted as a possible non-ferrous linear debris and may be a rope or chain.	SSS Mosaic	-
7136	Magnetic	522549	415980	A2_l	-	-	-	30	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7137	Magnetic	522588	415901	A2_l	-	-	-	29	A small negative monopole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7138	Magnetic	522542	416036	A2_l	-	-	-	49	A small symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7139	Magnetic	522524	416007	A2_l	-	-	-	66	A medium symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7140	Magnetic	522499	416058	A2_l	-	-	-	32	A small asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7141	Magnetic	522453	416065	A2_l	-	-	-	32	A small asymmetric dipole with peak and trough over two profile lines. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7142	Debris field	522379	416019	A2_h	13.9	1.6	0.2	-	A distinct curvilinear dark reflector with a small angular dark reflector measuring 2.6 x 1.6 m at the northern end. Visible in the MBES as a rounded mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris field with an object	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									attached at the northern end that may be an anchor.		
7143	Magnetic	522386	416094	A2_l	-	-	-	31	A small symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7144	Debris field	522422	416071	A2_h	8.7	1.4	0.2	-	A small angular dark reflector. Visible in the MBES data as a small sub-angular mound within surrounding scour measuring 1.4 x 1.4 m, with a linear feature attached, extending to the south-east. No anomalous features were identified in the Mag. data at this location. Interpreted as non-ferrous debris field with an object at the north-west end that may be an anchor.	MBES	-
7145	Magnetic	522419	416095	A2_l	-	-	-	14	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7146	Magnetic	522422	416132	A2_l	-	-	-	19	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7147	Linear debris	522448	416179	A2_h	22.6	0.3	0.1	-	A long, curvilinear dark reflector with a short shadow. Also visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic, MBES	-
7148	Magnetic	522369	416200	A2_l	-	-	-	28	A small symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7149	Debris	522260	416284	A2_h	7.3	0.6	0.1	-	A straight, linear dark reflector comprising two parallel objects, orientated north-west to south-east. Also visible on the MBES as an elongate mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible non-ferrous debris.	SSS Mosaic, MBES	-
7150	Magnetic	522223	416228	A2_l	-	-	-	8	A small, broad symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7151	Linear debris	522172	416334	A2_h	13.0	0.3	0.1	-	A long, curvilinear dark reflector with a short shadow. Also visible in the MBES as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as non-ferrous linear debris and may be a short length of rope or chain.	SSS Mosaic, MBES	-
7152	Magnetic	522312	416348	A2_l	-	-	-	8	A small, broad symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7153	Magnetic	522379	416341	A2_l	-	-	-	19	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7154	Magnetic	522343	416250	A2_l	-	-	-	46	A small, broad asymmetric dipole with peak and trough on one profile line. Also visible on adjacent line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7155	Linear debris	522349	416237	A2_h	39.0	0.2	0.1	-	A long, curvilinear dark reflector with a short shadow. Also visible in the MBES dataset as a curvilinear mound orientated approximately east to west. No anomalous features were identified in the Mag. dataset at this location. Interpreted as possible non-	SSS Mosaic, MBES	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
									ferrous linear debris and may be a length of rope or chain.		
7156	Linear debris	522401	416241	A2_h	69.8	0.2	0.2	-	A very long, curvilinear dark reflector with a short shadow aligned in a 'v' shape on the seabed. Also visible in the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as possible non-ferrous linear debris and may be a length of rope or chain.	SSS Mosaic, MBES	-
7157	Debris	522421	416193	A2_h	7.9	3.0	0.2	-	An angular bright reflector with some indistinct internal dark reflectors. Also visible in the MBES dataset as a highly angular mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as possible non-ferrous debris.	SSS Mosaic, MBES	-
7158	Magnetic	522527	416284	A2_l	-	-	-	5	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7159	Magnetic	522609	416212	A2_l	-	-	-	15	A small, broad symmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	Anomaly type	External references
7160	Magnetic	522658	416194	A2_l	-	-	-	7	A small, broad asymmetric dipole with peak and trough on one profile line. No anomalous features were identified in the SSS or MBES data at this location. Interpreted as possible ferrous debris either buried or with no surface expression.	Mag.	-
7161	Debris	522692	416170	A2_h	5.5	0.3	0.1	-	A short, slightly curved linear dark reflector with a short shadow. Visible in the MBES dataset as a curved mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as possible non-ferrous debris.	SSS Mosaic, MBES	-
7162	Dark reflector	522229	415862	A2_l	15.3	0.2	0.1	-	A distinct, slightly curvilinear dark reflector. Visible on the MBES dataset as a curvilinear mound. No anomalous features were identified in the Mag. dataset at this location. Interpreted as a possible natural feature or possible non-ferrous debris.	SSS Mosaic, MBES	-

1. Co-ordinates are in OSGB 36
2. Positional accuracy estimated ±10 m

Annex 6: Maritime Recorded Losses

Source ID	Year	Name	Description
NRHE 1302808	1810	*Margaret*	A wooden sailing cargo vessel was stranded at Stallingborough.
NRHE 1358152	1831	*Atalanta*	A cargo vessel
NRHE 1363871	1876	*Lion*	An English ketch
NRHE 1303508	1880	*Aguia*	A ketch that was stranded and lost in strong wind conditions.
NRHE 1550211; HER MNL4431	1881	*Chanticleer*	A fishing ketch or smack beached near Stallingborough on 18 Jan 1881.
NRHE 943012	1896	*Guiding Star*	A keel that was stranded and lost in strong wind conditions.
NRHE 943144	1920	*Singapore*	A trawler that sank off Immingham following a collision.

Annex 7: Aircraft Recorded Losses

Source ID	Year	Name	Description
NRHE 1341163; HER MNL4433	1944	HALIFAX MKII MZ576	Two engines feathered; ditched off Immingham, Lincs. 28 October 1944.

Annex 8: Aerial Photography

Vertical Photogaphs

Sortie Number	Frame Number	Date
RAF/3G/TUD/UK/203	5368	12 MAY 1946
RAF/3G/TUD/UK/203	5369	12 MAY 1946
RAF/CPE/UK/1748	2008	21 SEP 1946
RAF/CPE/UK/1748	2009	21 SEP 1946
RAF/CPE/UK/1748	5022	21 SEP 1946
RAF/CPE/UK/1748	5023	21 SEP 1946
RAF/CPE/UK/2043	1079	29 APR 1947
RAF/CPE/UK/2043	1080	29 APR 1947
RAF/CPE/UK/2043	1081	29 APR 1947
RAF/540/1009	11	04 FEB 1953
RAF/540/1009	12	04 FEB 1953
RAF/540/1009	13	04 FEB 1953
RAF/540/1009	14	04 FEB 1953
RAF/540/1061	1	07 FEB 1953
RAF/540/1061	2	07 FEB 1953
RAF/542/160	94	13 APR 1955
RAF/542/160	95	13 APR 1955
RAF/542/160	94	13 APR 1955
RAF/542/160	95	13 APR 1955
RAF/WAD/2	214	01 FEB 1953
RAF/WAD/2	215	01 FEB 1953
RAF/WAD/2	216	01 FEB 1953
RAF/WAD/2	217	01 FEB 1953
RAF/WAD/2	218	01 FEB 1953

Sortie Number	Frame Number	Date
MAL/65051	131	20 MAY 1965
MAL/65051	132	20 MAY 1965
MAL/65051	166	20 MAY 1965
MAL/65051	167	20 MAY 1965
MAL/70084	46	28 OCT 1970
MAL/70084	47	28 OCT 1970
MAL/70084	48	28 OCT 1970
MAL/70084	85	28 OCT 1970
MAL/70084	86	28 OCT 1970
MAL/70084	87	28 OCT 1970
RAF/613E/UK558	2231	04 SEP 1940
RAF/613E/UK558	2232	04 SEP 1940
RAF/613A/BR19/3	14	02 SEP 1940
RAF/613A/BR19/3	15	02 SEP 1940
RAF/613D/BR52	14	13 MAR 1941
RAF/613D/BR52	15	13 MAR 1941
MAL/76009	88	01 MAR 1976
MAL/76009	90	01 MAR 1976
MAL/76009	114	01 MAR 1976
MAL/76009	116	01 MAR 1976
RAF/FNO/138	6073	06 SEP 1942
RAF/FNO/138	6074	06 SEP 1942
OS/62096	54	01 SEP 1962
OS/62096	55	01 SEP 1962
OS/62096	80	01 SEP 1962
OS/62096	81	01 SEP 1962
OS/71440	4	25 AUG 1971

Sortie Number	Frame Number	Date
OS/71440	5	25 AUG 1971
OS/90248	5	18 AUG 1990
OS/90248	6	18 AUG 1990
OS/90248	28	18 AUG 1990
OS/90248	29	18 AUG 1990
OS/92296	90	11 AUG 1992
OS/92296	91	11 AUG 1992
OS/92296	92	11 AUG 1992
OS/95725	80	19 AUG 1995
OS/95725	81	19 AUG 1995
OS/95725	86	19 AUG 1995
OS/95725	87	19 AUG 1995

Oblique Photographs (civilian)

Photo Reference (NGR and Index number)	Film and Frame Number	Date
TA 2014 / 1	NMR 20259/ 13	22 JUN 2005
TA 2015 / 2	NMR 17096/ 11	13 MAR 1998
TA 2015 / 3	NMR 17096/ 12	13 MAR 1998
TA 2015 / 4	NMR 17096/ 13	13 MAR 1998
TA 2015 / 5	NMR 17079/ 33	13 MAR 1998
TA 2015 / 6	NMR 17079/ 34	13 MAR 1998
TA 2015 / 7	NMR 17079/ 35	13 MAR 1998
TA 2015 / 8	NMR 17079/ 36	13 MAR 1998
TA 2015 / 16	NMR 20294/ 06	22 JUN 2005
TA 2015 / 17	NMR 20259/ 15	22 JUN 2005
TA 2015 / 18	NMR 20259/ 16	22 JUN 2005
TA 2015 / 19	NMR 20259/ 18	22 JUN 2005

Photo Reference (NGR and Index number)	Film and Frame Number	Date
TA 2015 / 20	NMR 20620/ 06	12 OCT 2006
TA 2015 / 21	NMR 20620/ 07	12 OCT 2006
TA 2015 / 23	AFL 61979/ EAW029095	04 MAY 1950
TA 2016 / 6	NMR 20620/ 05	12 OCT 2006
TA 2115 / 12	NMR 20259/ 17	22 JUN 2005

Oblique Photographs (military)

Library and Frame Number	Photo Reference (NGR and Index number)	Date
RAF 30110/ PO-0171	TA 2115 / 1	12 JUN 1952
RAF 30110/ PO-0172	TA 2115 / 2	12 JUN 1952
RAF 30110/ PO-0173	TA 2115 / 3	12 JUN 1952
RAF 30110/ PO-0174	TA 2115 / 4	12 JUN 1952
RAF 30110/ PO-0175	TA 2115 / 5	12 JUN 1952
RAF 30110/ PO-0176	TA 2115 / 6	12 JUN 1952
RAF 30110/ PO-0177	TA 2115 / 7	12 JUN 1952
RAF 30110/ PO-0178	TA 2115 / 8	12 JUN 1952
RAF 30110/ PO-0179	TA 2115 / 9	12 JUN 1952
RAF 30110/ PO-0180	TA 2115 / 10	12 JUN 1952
RAF 30110/ PO-0181	TA 2115 / 11	12 JUN 1952
RAF 30110/ PO-0182	TA 2015 / 9	12 JUN 1952
RAF 30110/ PO-0183	TA 2015 / 10	12 JUN 1952
RAF 30110/ PO-0184	TA 2015 / 11	12 JUN 1952
RAF 30110/ PO-0185	TA 2015 / 12	12 JUN 1952
RAF 30110/ PO-0186	TA 2015 / 13	12 JUN 1952
RAF 30110/ PO-0187	TA 2016 / 1	12 JUN 1952
RAF 30110/ PO-0188	TA 2016 / 2	12 JUN 1952

Library and Frame Number	Photo Reference (NGR and Index number)	Date
RAF 30110/ PO-0189	TA 2016 / 3	12 JUN 1952

Annex 9: Figures