



Scotland England Green Link 1 / Eastern Link 1 - Marine Scheme

Environmental Appraisal Report
Volume 3

Appendix 12.1 - Marine Archaeology Technical Report

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12. Marine Archaeology

12.1 Introduction

Wessex Archaeology was commissioned by AECOM to prepare a marine archaeological baseline Technical Report including a high level Environmental Appraisal (EA) for the marine component of the Scotland England Green Link 1 (SEGL 1) / Eastern Link 1 (EL1), which extends from the Mean High Water Springs (MHWS) at the landfall on Thorntonloch Beach, East Lothian, Scotland to the MHWS at the English landfall, at Seaham, England. This Technical Report is prepared in support of the Environmental Appraisal Report (EAR) for the proposed SEGL1 project.

This technical report comprises a marine archaeological baseline study of the Marine Scheme, based on an archaeological assessment of geophysical and geotechnical data, gathered as part of the Project surveys, 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 report also includes an assessment of the value and sensitivity of any identified marine or intertidal archaeological assets within the Marine Scheme and additional 1 km buffer area (known as the Archaeological Study Area). An assessment of the seascape character will also be undertaken.

Proposed Development

The Marine Scheme comprises the marine component of the Scotland England Green Link 1 (SEGL1)/ Eastern Link 1 (EL1) and extends from Mean High Water Springs (MHWS) at the Scottish landfall on Thorntonloch beach, to MHWS at the English landfall near Seaham. It is located within both English and Scottish territorial waters, within the 12 nautical mile (NM) limit from the coast. The Marine Scheme comprises an installation corridor of approximately 176 km length and 500 m maximum width within which cables will be installed (hereinafter referred to as the 'marine installation corridor'). The marine installation corridor extends from kilometre point (KP) 0, at its landfall in Scotland, to KP 176, at its landfall in England (See Figure 1-3). The Marine Scheme activities cover the following phases: installation, operation (including maintenance and repair), and decommissioning. Detailed descriptions of each of the Marine Scheme phases can be found in Volume 2 Chapter 2: Project Description.

Scope of Document

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

Aims

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 EAR. The objectives of the appraisal are as follows:

- to provide details of relevant legislation, national and local planning policy, and best practice guidance;
- to assess the 2021 geophysical survey datasets provided by Furgo in order to identify any buried palaeolandscapes 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;
- 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;
- to summarise the Historic Seascape Character for the area that the project truncates;
- to assess the significance of the known and potential marine archaeological resource through weighted consideration of their valued components; and

- to recommend mitigation measures for any potential archaeological or cultural heritage assets newly identified within the project area, including the addition of new Archaeological Exclusion Zones where necessary within the project area.

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12.2 Legislative Context

The Marine Scheme falls within different national jurisdictions, each covered by separate legislation and guidance, and is under the responsibility of different curators and heritage agencies. 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.

12.2.1 Scotland

Historic Environment Scotland (HES) is responsible for the archaeological resource within Scotland's Territorial Waters (up to 12 NM). The Marine Scotland Licencing Organisation Team (MS-LOT) is responsible for licencing, regulating and planning marine activities within Scotland's Territorial Waters (up to 12 NM).

The following relevant legislation applies within Marine Scotland's licensing area:

- Marine (Scotland) Act 2010;
- Protection of Wrecks Act 1973 (PWA 1973): Section Two;
- Ancient Monuments and Archaeological Areas Act 1979 (AMAA 1979) (as amended);
- Protection of Military Remains Act 1986 (PMRA 1986); and
- Merchant Shipping Act 1995 (MSA 1995).

The Marine (Scotland) Act 2010 is the primary legislation relevant to marine development within Scottish Territorial Waters. The Marine (Scotland) Act 2010 provides a framework to achieve sustainable development in Scottish waters, implementing marine planning, licensing, conservation and enforcement. It is the responsibility of the Scottish Ministers and public authorities to act to protect and enhance the marine biodiversity and the preservation of marine historic assets of national importance.

Marine historic assets may also be designated under the Marine (Scotland) Act 2010 (Section 73) and the AMAA 1979 (Part II). Military wrecks and aircraft remains may be protected under the PMRA 1986. Ownership of any wreck remains is determined in accordance with the MSA 1995.

12.2.2 England

Historic England (HE) is responsible for the archaeological resource within England's Territorial Waters, up to the 12 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.

Within English Territorial Waters the following relevant legislation applies:

- Marine and Coastal Access Act 2009 (MCAA 2009);
- Protection of Wrecks Act 1973 (PWA 1973): Sections One and Two;
- Ancient Monuments and Archaeological Areas Act 1979 (AMAA 1979) (as amended);
- Protection of Military Remains Act 1986 (PMRA 1986); and

- Merchant Shipping Act 1995 (MSA 1995).

The MCAA 2009 is the primary legislation relevant to marine development within English Territorial Waters.

Marine historic assets may also be designated under the PWA 1973 and the AMAA 1979. Military wrecks and aircraft remains may be protected under the PMRA 1986. Ownership of any wreck remains is determined in accordance with the MSA 1995.

12.2.3 International Conventions

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 02 January 2009 having been signed or ratified by 20 member states. It has since been ratified or accepted by an additional 60 member states.

12.2.4 Policy

The UK Marine Policy Statement (MPS) (MPS, 2011) was adopted in 2011 by all UK Administrations in March 2011 as part of a new system of marine planning being introduced across UK seas (Department for Environment, Food and Rural Affairs (Defra) (Defra, 2011). 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.

12.2.4.1 Scotland

The Marine (Scotland) Act 2010 is the primary legislation relevant to marine development plans within Scottish Territorial Waters. Under this legislation, Scottish Ministers adopted a National Marine Plan (Marine Scotland, 2015). The National Marine Plan sets out a single framework for sustainable development within Scotland's marine area. General Policy 6 for the Historic Environment states, *"development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance"* and also notes the requirement for development proposals to provide *"information on the significance of known heritage assets and the potential for new discoveries to arise"*. Proposals should demonstrate how any adverse impacts will be avoided, or, if not possible, minimised and mitigated.

The Scottish Marine Regions Order 2015 identifies 11 Scottish Marine Regions for the purposes of regional marine planning and establishes their boundaries. The Marine Scheme is partly located within the Forth and Tay region. No regional Forth and Tay marine plan has yet been published.

12.2.4.2 England

The primary planning framework relevant to the Marine Scheme in England is the National Planning Policy Framework (NPPF) published in March 2012 and replacing previous Planning Policy Statement 5 in England (Department for Communities and Local Government (DCLG) 2012, revised 2018) and revised in February 2019. As with the Marine Policy Statement, a core planning principle is to *"conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations"*.

Under the MCAA 2009, 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 assets. Marine plans must also be in accordance with other UK national policy, including the National Planning Policy Framework (DCLG, 2018).

The MMO have divided the inshore and offshore waters around England into 11 plan areas for which marine plans are to be produced. The Marine Scheme is within the North East Inshore and North East Offshore Marine Plan Area (HM Government, 2021).

The North East Inshore and North East Offshore Marine Plans was published in June 2021. This states (NE-HER-1):

“Proposals that demonstrate they will conserve and enhance the significance of heritage assets will be supported. Where proposals may cause harm to the significance of heritage assets, proponents must demonstrate that they will, in order of preference:

a) *avoid*

b) *minimise*

c) *mitigate*

- any harm to the significance of heritage assets.

If it is not possible to mitigate, then public benefits for proceeding with the proposal must outweigh the harm to the significance of heritage assets.”

12.2.5 Guidance

There is no specific guidance for offshore cable projects, therefore the guidance below is taken from current best practice. The appraisal has been completed in line with the following national, regional and industry specific standards and guidance, as relevant to cable projects:

- Standard and Guidance for Archaeological Advice by Historic Environment Services (ClfA, 2014, updated 2020);
- Code of Conduct (ClfA, 2014 (Revised 2019));
- Military Aircraft Crash Sites – Archaeological Guidance on their Significance and Future Management (English Heritage (now Historic England), 2002);
- Managing Significance in Decision-Taking in the Historic Environment (English Heritage (now Historic England), 2015a);
- Management of Research Projects in the Historic Environment: the MoRPHE Project Managers' Guide (English Heritage (now Historic England), 2015b);
- Preserving Archaeological Remains: Decision-Taking for Sites under Development (English Heritage (now Historic England), 2016);
- Deposit Modelling and Archaeology. Guidance for Mapping Buried Deposits, Historic England, Swindon (Historic England, 2020);
- Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee (JNAPC), 2006);
- Annexe to the Protocol Guidance on the Use of the Protocol for Reporting Finds of Archaeological Interest in Relation to Aircraft Crash Sites at Sea (Wessex Archaeology, 2008);
- Our Seas - A shared resource: High level marine objectives (DEFRA, 2009);
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (COWRIE, 2011);
- COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007);
- Ships and Boats: Prehistory to Present - Designation Selection Guide (English Heritage (now Historic England), 2012);

- Standard and Guidance for Historic Environment Desk-based Assessment (ClfA, 2014, revised edition 2020);
- Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (English Heritage (now Historic England), 2013);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (English Heritage (now Historic England), 2015c);
- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects. (The Crown Estate, 2021);
- Protocol for Archaeological Discoveries: Offshore Renewables Projects (ORPAD). (The Crown Estate, 2014); and
- Commercial Renewable Energy Development and the Historic Environment (Historic England, 2021).

12.3 Methodology

12.3.1 Study Area

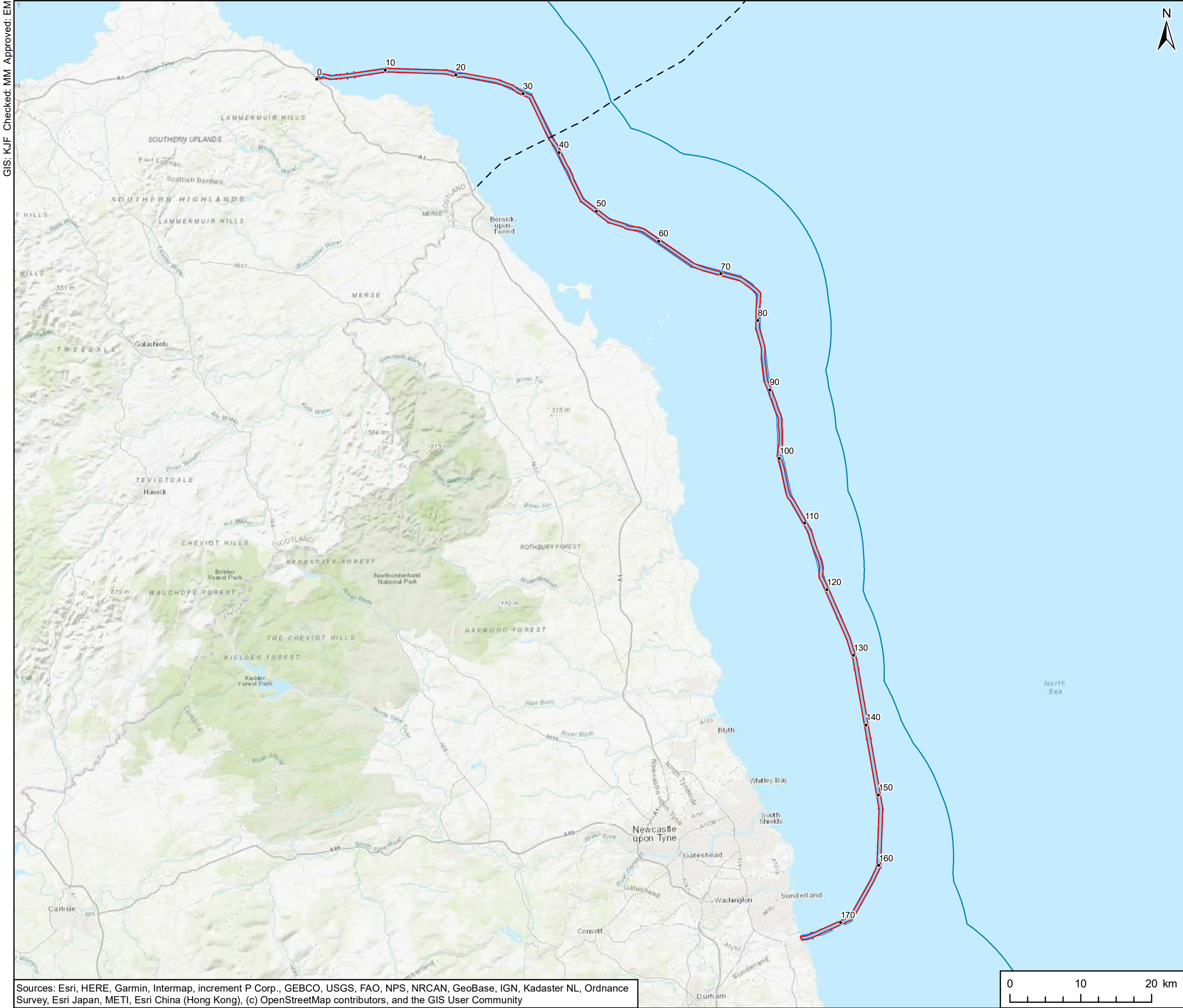
The area appraised in this report is defined by the extent of the Marine Scheme as provided by the Client, which is located within UK marine area. This consists of a 500 m wide marine installation corridor.

For the purposes of this appraisal, the Marine Scheme has been sub-divided into the following sections:

- **Scottish Territorial Waters** – extending from KP 0 to KP 37 / 38;
- **English Territorial Waters** – extending from KP 37 / 38 to KP 176.

The geophysical study area is located within the boundary of the marine installation corridor (Figure 12.1-1). The geophysical study area for this report is defined as the extents of the side scan sonar (SSS) dataset, running from the Scottish landfall at Thorntonloch Beach to the English landfall at Seaham. The geophysical study area is approximately 600 m wide, reducing to approximated 400 m wide in some parts of the nearshore section (Fugro, 2021a), as illustrated in Figure 12.1-1.

GIS: KJF Checked: MM Approved: EM



PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Kilometre Point (KP)
 - Scottish/English Water Border
 - UK Territorial Sea Limit
 - Geophysical Study Area



TITLE
**Figure 12.1-1
Location of Marine Installation Corridor**

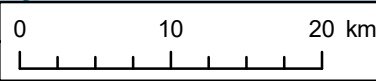
REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
1 of 1

DATE
27/04/2022

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Coordinate System: ETRS89 UTM30N



Scale @ A3 1:500,000

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12.3.1.1 Search Area

An Archaeological Study Area (ASA) consisting of an additional 500 m buffer area around the extents of the marine cable route was used as the search area for obtaining records from relevant archive databases. This ASA allows for a greater understanding of the wider archaeological baseline environment, with the dual purpose of enabling any archaeological trends within the region to be recognised and to allow any marine archaeology and cultural heritage assets identified to be represented in a broader archaeological context.

12.3.2 Archaeological Desk-Based Appraisal

12.3.2.1 Key Themes

The methodology within this EAR follows the best practice professional guidance outlined by the Chartered Institute for Archaeologists' (CIfA) *Standard and Guidance for Historic Environment Desk-Based Assessment* (CIfA, 2014, revised edition 2020).

The marine themes relevant to marine archaeological baseline appraised in this report are:

- seabed prehistory (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g. handaxes);
- 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);
- intertidal heritage assets; and
- historic seascape character.

12.3.2.2 Data Sources

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

- United Kingdom Hydrographic Office (UKHO) data for charted wrecks and obstructions;
- National Record of the Historic Environment (NRHE) maintained by HE, comprising data for terrestrial and marine archaeological sites, find spots and archaeological events;
- National Heritage List for England maintained by HE, comprising data of designated heritage assets including sites protected under the PMRA 1986 and the PWA 1973;
- Canmore Historic Environment Records (HER) maintained by HES, comprising a database of all recorded terrestrial and marine archaeological sites, find spots and archaeological events;
- East Lothian and Scottish Borders County Council HER, comprising a database of all recorded terrestrial and marine archaeological sites, find spots and archaeological events within the county and offshore;
- Durham and Tyne and Wear County Council HER, comprising a database of all recorded terrestrial and marine archaeological sites, find spots and archaeological events within the county and offshore;
- Historic Seascape Characterisation (HSC) for the North East Rapid Coastal Zone assessment (NERCZA) carried out by Archaeological Research Services in 2009, and the HSC undertaken by the University of Newcastle in 2012-2013;
- relevant mapping including Admiralty Charts, British Geological Survey (BGS), Ordnance Survey and historic maps; and
- relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeology Data Service and other websites (presented in the 'References').

12.3.2.3 Data Structure

This report is supported by a Geographic Information System (GIS) using ArcGIS 10.6.1, 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. These were used to inform the assessment of geophysical data that are presented in Section 12.4.2.

Within this appraisal, the gazetteer is compiled and presented in Universal Transverse Mercator (UTM) Zone 30 North projected from a European Terrestrial Reference System (ETRS) 1989 datum.

Information relating to the marine archaeology and cultural heritage assets that did not include location or positional information was also used to inform the marine archaeological baseline appraisal where relevant.

12.3.2.4 Chronology

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.

A list of the main archaeological periods of the British Isles is referred to in the text, along with their broadly defined dates. These are presented in Appendix A.

12.3.2.5 Seabed Prehistory

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. This appraisal was further supported by the examination of models of past sea level, palaeo-shorelines and submerged prehistoric landscapes.

The geophysical data obtained were reviewed to identify deposits of potential geoarchaeological interest and were compiled to form a gazetteer as part of the seabed prehistory baseline. These records were each given a unique identifier beginning with 7900 continuing sequentially (see Appendix B) and were added to the Marine Scheme GIS.

12.3.2.6 Maritime and Aviation Archaeology

The sources of data for maritime and aviation resource listed above have been collated and summarised in order to develop a baseline of marine cultural heritage for the study area, and the potential for encountering unknown shipwreck and aircraft crash sites (Sections 12.4.2.5 and 12.4.2.7). Sources of data relevant to maritime and aviation archaeology are the UKHO, NRHE, Canmore and local HERs.

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 (Appendix C) and were added to the Marine Scheme GIS.

For the purpose of this appraisal, records with duplicate positions between datasets were amalgamated and their co-ordinates are taken from the UKHO dataset as the raw data therein is based on hydrographic survey data presented in World Geodetic System (WGS) 1984 datum. These co-ordinates were projected from WGS84 into UTM30N eastings and northings using the Quest Geodetic Calculator version. Furthermore, the NRHE and HER datasets are primarily terrestrial datasets expressed in British National Grid (BNG) and are considered to be less accurate offshore.

The research for maritime and aviation resource was then combined with the archaeological appraisal of geophysical survey data. These records were each given a unique identifier beginning with 7000, continuing sequentially (Appendix D) were added to the Marine Scheme GIS. All the results are presented in ETRS89 UTM30N.

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.

Details regarding maritime Recorded Losses, whose Named Location happens to be located within the Marine Scheme are presented in a gazetteer format (Appendix E). These records have retained their original identification assigned by the UKHO, NRHE, Canmore or HER for ease of cross referencing. Where records are duplicated between datasets all corresponding identification numbers have been included but are referred to in the text by the NRHE Monument ID if one exists. The gazetteer does not include positional data due to the inaccuracies therein.

The baseline appraisal 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 appraisal underlines the potential for encountering unknown shipwreck and aircraft crash sites within the Marine Scheme (English Heritage (now Historic England), 2002) (Wessex Archaeology, 2008).

12.3.2.7 Intertidal Archaeology

Since the appraisal of the onshore archaeological elements of the Marine Scheme will cover to MHWS only, there is no overlap between the onshore assessments and marine appraisal within the intertidal area.

Data from the NRHE, Canmore 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 are the centroid generated using ArcGIS 10.6.1, which may lie outside the study area.

12.3.2.8 Assessment of Historic Seascape Character (HSC)

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

Seascape assessment reflects the holistic approach to landscape of the European Landscape Convention, extending it to the sea. Seascape Character Areas include coastal land, intertidal and marine environments and cover the offshore environment to the territorial limit (12 NM). HSC assessment is the identification and interpretation of the historic dimension of the present day coastal and marine environment (Natural England, 2012, p. 33). This is done by mapping and describing the historic cultural influences which define present seascape perceptions across all of England's marine areas and coastal land.

The baseline summary for character of the historic seascape within the study area was appraised using the results of the Seascape Character Assessment for the North East Inshore and North East Offshore Marine Plan areas (MMO, 2018). The HSC include ArcGIS shapefiles of the character areas and reports including a regional and national assessment of the historic seascape character types.

No rapid coastal zone appraisal nor historic seascape characterisation have been undertaken at the Scottish landfall in East Lothian as no data is currently available to undertake such an appraisal in Scotland. However, the seascape character within the Scottish study area is likely to have similar characteristics to that described within English waters (see Section 12.4.4).

12.3.3 Geophysical Appraisal Methodology

Wessex Archaeology was commissioned to undertake an archaeological appraisal of geophysical data covering the marine installation corridor. This consisted of an appraisal of geophysical survey data comprising sub-bottom profiler (SBP), side scan sonar (SSS), magnetometer (Mag.) and multibeam echosounder (MBES) data sets, acquired by Fugro GB (North) Marine limited (Fugro).

12.3.3.1 Data Sources

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

- Geophysical survey datasets acquired by Fugro comprising SBP, SSS, Mag. and MBES data;
- Recorded wreck and obstruction data acquired via the United Kingdom Hydrographic Office (UKHO);
- Relevant background mapping from the area (British Geological Survey, 1988); and
- Client supplied survey reports (Fugro, 2021a) (Fugro, 2021b), (Fugro, 2021c).

12.3.3.2 Geophysical Data – Technical Specifications

The geophysical data were acquired between 19 October 2020 and 29 January 2021 by Fugro. The data were acquired onboard the MV *Fugro Venturer* and the nearshore geophysical data were acquired onboard the *Fugro Valkyrie*. The geophysical data were acquired using towed and hull-mounted sensors in water depths of <35 m. In water depths >35 m, data were also acquired using an autonomous underwater vehicle (AUV) (Fugro, 2021a) (Fugro, 2021b). Further details on the equipment used is in Table 12-1.

Table 12-1: Summary of survey equipment

Survey company	Survey Vessel	Data Type	Equipment	Data Format
Fugro	<i>SV Echo Surveyor VI AUV</i>	SBP	Edgetech DW-106 Chirp	.sgy
		MBES	Kongsberg Simrad EM2040	.xyz
		SSS	Edgetech deepwater full spectrum chirp (105 / 410 kHz, 90 m range)	.xtf
		Positioning	Honeywell IMU HG9900/GPS	N/A
	<i>MV Fugro Venturer</i>	SBP	Edgetech 3300 Hull-mounted Chirp	.sgy
		MBES	Kongsberg EM2040 Dual Rx	.xyz
		SSS	Edgetech 4205 (540 / 850 kHz, 50 m range)	.xtf
		Mag.	Geometrics G-882	.xls
		Positioning	Seatex Seapath 380	N/A
	<i>Fugro Valkyrie</i>	SBP	Innomar SES-2000 Medium	.sgy
		MBES	Applied Acoustics 200 surface towed boomer	.xyz
		SSS	Edgetech 4200 (300 / 600 kHz, 25 m / 50 m range)	.xtf
		Mag.	Geometrics G-882	.xls
		Positioning	Applanix POS MV MRU	N/A

12.3.3.3 Geophysical Data – Processing

A number of datasets were appraised within the geophysical study area (refer to Section 12.3.1 for a definition); each dataset was processed separately using the following software (Table 12-2).

Table 12-2: Software used for geophysical assessment

Dataset	Processing software	Interpretation and rationalisation
SBP	CodaOctopus Survey Engine v5.11	ArcMap v10.6
MBES	QPS Fledermaus v7.7.5	
SSS	CodaOctopus Survey Engine v5.11	
Mag.	Geometrics MagPick v3.25 and proprietary software	

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

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.

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

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.

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

MBES data were analysed to identify any unusual seabed structures that could be shipwrecks or other anthropogenic debris. The data were gridded at 0.2 m and analysed using QPS Fledermaus software, which enables a 3-D visualisation of the acquired data and geo-picking of seabed anomalies. MBES data were also used in the palaeogeographic appraisal.

A number of the high frequency .xtf SSS data files were processed using CodaOctopus Survey Engine Sidescan+ software. This allowed the data to be replayed with various gain settings in order to optimise the quality of the images. The data were interpreted for any objects of possible anthropogenic origin. This involves creating a database of anomalies within Coda by tagging individual features of possible archaeological potential, recording their positions and dimensions, and acquiring an image of each anomaly for future reference.

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. Appraisal is made of such groups of anomalies during data interpretation to determine which of these alternatives is the most likely.

The Mag. data were processed using a combination of Geometrics MagPick and proprietary software in order to identify any discrete magnetic contacts which could represent buried metallic debris or structures such as wrecks.

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

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

12.3.3.4 Geophysical Data – Data Quality

Once processed, the geophysical data sets were individually appraised for quality and their suitability for archaeological purposes and rated using the following criteria (Table 12-3).

Table 12-3: 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.

The quality of the nearshore parametric sonar data and the hull-mounted chirp data have been rated 'Good' using the criteria presented in Table 12-3. The data were mostly clear and appeared to be largely unaffected by sea state or weather conditions.

The quality of the AUV chirp data have been rated 'Average' using the above criteria. The auto record delay adjustments of the data has resulted in numerous 'jumps' in the data, which can make it challenging to trace horizons over long distances. However, the data itself is clear with distinct horizons visible making it possible to identify and map out features within the data and, as such, the data are considered suitable for archaeological assessment.

The MBES data were rated as 'Good' using the above criteria. The data quality and resolution of 0.2 m was found to be of a good standard and suitable for archaeological assessment of objects and debris over 0.2 m in size.

The towed SSS data acquired in water depths of <35 m have been rated 'Good'. The data displayed occasional weather noise and cable snatching due to sea state and/or weather conditions, but overall

the data were not affected to a significant degree and therefore considered suitable for archaeological interpretation. Within the nearshore sections, there were areas of underlying geology outcropping at seabed which made the identification of some features within these areas more challenging.

The SSS data acquired by AUV have been rated as 'Good' using the above criteria table. The range of 90 m made the identification of small anomalies slightly more difficult. However, larger features of interest were still identifiable and, as such, the dataset was considered suitable for archaeological interpretation.

The Mag. data have been rated as 'Average' using the criteria presented in Table 12-3. There was some influence from background geology which may have masked some smaller features, and some impacts from the swell/weather conditions visible. However, larger features were identifiable in the data and, as such, it is considered suitable for archaeological assessment. In addition, occasional positioning offsets were noted in the offshore Mag. data, resulting in sporadic positioning differences between anomalies on immediately adjacent lines of up to 25 m.

12.3.3.5 Geophysical Data – Anomaly Grouping and Discrimination

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

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

The Fugro contact listing was compared to our results to enable us to note and investigate any differences in interpretation prior to submission of our final gazetteer (Appendix D). Although such differences can occur between individuals, in part due to variations in software and interpretation techniques, they primarily arise owing to the reasons for the interpretation. In this case, the data is being interpreted purely from an archaeological potential perspective rather than from a geological or engineering viewpoint.

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 in (Table 12-4).

Table 12-4: 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	SBP, MBES
Archaeological	A1	Anthropogenic origin of archaeological interest	MBES, SSS, Mag
Archaeological	A2	Uncertain origin of possible archaeological interest	MBES, SSS, Mag
Archaeological	A3	Historic record of possible archaeological interest with no corresponding geophysical anomaly	MBES, SSS, Mag.
Non-archaeological	U1	Not of anthropogenic origin	MBES, SSS, Mag.

Overview classification	Discrimination	Criteria	Data type
Non-archaeological	U2	Known non-archaeological feature / Feature of non-archaeological interest	MBES, SSS,
Non-archaeological	U3	Recorded loss	MBES, SSS,
Non-impact	O1	Outside horizontal footprint of study area	MBES, SSS,
Non-impact	O2	Outside vertical footprint of proposed impact	SBP
Non-impact	O3	Area subsequently cleared after data acquired, anomaly/object recovered	MBES, SSS,

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 appraisal for further evaluation should more information become available.

The geophysical study area used for this appraisal is defined as the extents of the client-supplied SSS mosaic. It should be noted that the MBES data coverage is generally less than this and, as such, there are some areas in the outer edges of the geophysical study area which have no MBES data coverage.

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

Additionally, the geophysical datasets were acquired centred on the originally proposed cable route, which was updated mid-survey (Fugro 2021a: 5) and differs from the updated / current proposed cable route on which the study area is centred. As such, the extents of the geophysical survey area on occasion differs from, and extends outside of, the study area. Only anomalies identified within the geophysical study areas have been reported on here.

12.3.4 Impact Appraisal Criteria

12.3.4.1 Receptor/ Asset Sensitivity

To appraise the potential impacts of the Marine Scheme on marine archaeology and cultural heritage, the conceptual approach known as the 'source-pathway-receptor' model has been 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 assets). For the significance of any given impact to be fully understood and for appropriate mitigation to be identified, the sensitivity of any marine archaeology and cultural heritage assets that may be impacted need to be considered. This section outlines how the sensitivity of marine archaeology and cultural heritage assets is ascertained.

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

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

Marine archaeology and cultural heritage assets cannot typically adapt, tolerate or recover from physical impacts resulting in material damage or loss caused by project activities. Consequently, the sensitivity of each asset is predominantly quantified only by its value.

12.3.4.2 Value of a Receptor/ Asset

Based on Historic England's Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008, p. 21) the significance of a historic asset "*embraces all the diverse cultural and natural heritage values that people associate with it, or which prompt them to respond to it*".

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

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

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

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

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

The value of known archaeological and cultural heritage assets were appraised on a four-point scale using professional judgement informed by criteria provided in Table 12-5 below.

Table 12-5: Criteria to assess the archaeological value of marine assets

Value	Definition
High	<ul style="list-style-type: none"> • Best known, only example or above average example and / or significant or high potential to contribute to knowledge and understanding and / or outreach. Assets with a demonstrable international or national dimension to their importance are likely to fall within this category; <ul style="list-style-type: none"> – wrecked ships and aircraft that are protected under the Marine Scotland Act 2010, 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; and – known submerged prehistoric sites and landscapes with the confirmed presence of largely in situ artefactual material or palaeogeographic features with demonstrable

Value	Definition
	potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.
Medium	<ul style="list-style-type: none"> Average example and / or moderate potential to contribute to knowledge and understanding and / or outreach; <ul style="list-style-type: none"> 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 prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
Low	<ul style="list-style-type: none"> Below average example and / or low potential to contribute to knowledge and understanding and / or outreach; <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Poor example and / or little or no potential to contribute to knowledge and understanding and / or outreach. Assets with little or no surviving archaeological interest.

Furthermore, 'On the Importance of Shipwrecks' (Wessex Archaeology, 2006) suggests importance can be assessed through the 'BULSI' system, incorporating the following criteria: build, use, loss, survival and investigation. This represents all phases of a ships 'career' and tries to examine the shipwreck through its build and use, the manner in which it was lost and how it has survived and been investigated over time.

To further supplement this approach, the Aggregate Levy Sustainability Fund (ALSF) funded Marine Class Description and principles of selection for aggregate producing areas project (ALSF 5383), undertaken by Wessex Archaeology (Wessex Archaeology, 2008b), 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:

- 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;
- 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;
- 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;
- 1914 to 1945: this period encompasses the First World War (WWI), the Interwar years and the Second World War (WWII). 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; and
- 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.

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.

Wrecks dating from 1816 to the present day are more plentiful amongst known wrecks. The Marine Class Description and Principles of Selection project (Wessex Archaeology, 2008e) further revealed that a total of 96% of known and dated wrecks were lost in the period between 1860 and 1950. Due to their predominance in the known marine archaeological record, the special value of wrecks of this period thus depends upon their ability to exhibit both integral and relative factors based on attributes relating to the Wessex Archaeology 'BULSI' system of wreck assessment. The ALSF-funded project Assessing Boats and Ships 1860-1950 (Wessex Archaeology, 2011a; Wessex Archaeology, 2011b) 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 (Wessex Archaeology, 2008e) and historical thematic studies.

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

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

The perceived value of each marine archaeological asset is generally assessed and assigned on a site-by-site basis, depending on the criteria listed in Table 12-5. The UK Marine Policy Statement (DEFRA, 2011, p. 90) describes a heritage asset as holding a degree of significance. Significance relates to the heritage interest of an asset that may be archaeological, architectural, artistic or historic.

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.

12.3.5 Data Gaps and Limitations

12.3.5.1 Archaeological Data

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

The records held by the UKHO, NRHE, Canmore, HER and the other sources used in this appraisal are not a record of all surviving cultural heritage assets, rather a record of the discovery of a wide range of archaeological and historical components of the marine historic environment. The information held within these is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown. In particular, this relates to buried archaeological features.

12.3.5.2 Geophysical Data

It should be noted that complete Mag. data coverage was only acquired in the nearshore areas. Along the rest of the route, only two lines of data along the centre of the originally proposed cable route, plus some occasional additional lines, were acquired. As such, only the centre portion along the majority of the geophysical study area has direct Mag. coverage. However, the acquisition of data in this manner is standard practise for EIA level surveys, and it is anticipated that future pre-installation/UXO surveys will provide more complete coverage of the proposed cable route.

Furthermore, it should be noted that the lines of Mag. data acquired in the marine installation corridor were centred on the originally proposed cable route, which has since been amended (Fugro 2021a: 5). There is full acoustic (i.e. SSS and MBES) data coverage of the updated / current proposed cable route, but often no direct Mag. coverage in sections where it differs from the originally proposed cable route.

Any magnetic signal associated with small ferrous objects is only likely to be detected on Mag. survey lines acquired directly over or very close to the object. As such, any seabed features of possible archaeological interest identified outside of the central area of direct Mag. coverage could not be appraised for ferrous content at this time. Larger features, such as steel hulled wrecks, will have been visible in the data, but a more conservative approach has been adopted in determining Archaeological Exclusion Zones around wrecks and debris fields not directly covered by Mag. data. However, these can be refined based on any future geophysical survey results.

In addition, Mag. data are used to identify any discrete magnetic contacts which could represent buried ferrous debris or structures such as wrecks. Again, any such anomalies could not be identified beyond the area of direct Mag. data coverage at this time, and the potential remains for additional buried ferrous material to be present at the outer edges of the geophysical study area.

12.4 Baseline Conditions

This section covers the marine archaeology baseline for the Marine Scheme, with regard to seabed prehistory, seabed features, intertidal heritage assets and historic seascape character.

12.4.1 Seabed Prehistory

12.4.1.1 Geological Baseline and Archaeological Potential

The following is an overview of the geological and archaeological history of the wider region, from the Pleistocene to the Holocene marine transgression. This is based on a range of secondary sources, including academic papers, monographs, geological information (e.g. BGS mapping), and previous work undertaken by Wessex Archaeology from the area. This serves as a baseline for the palaeogeographic appraisal, and aids in producing a stratigraphy for the study area, assigning archaeological potential to identified units, and informing future sampling strategies.

The proposed Marine Scheme extends from the south-east coast of Scotland to the north-east coast of England. As a long, linear study area, the background geology varies from the Scottish landfall to the English landfall. In general, the geology in the study area can be summarised as outcropping bedrock of Carboniferous age or younger close to the coast, with increasing deposits of overlying Quaternary sediments further offshore where the Marine Scheme runs parallel along the coast, predominantly the Forth Formation, St Abbs Formation and the Wee Bankie Formation (Gatliff, et al., 1994).

The environment within the study area is currently fully marine, and a shallow marine basin has existed in the approximate location of the North Sea since the Early Tertiary (although the exact location and extent has altered over time), which is reflected in the geology of the region (Cameron, et al., 1992).

The recent geological history of the North Sea is directly linked to glacial/interglacial cycles experienced by the area during the Pleistocene (2.5 million – 10 kilo years ago¹ (ka)), which resulted in large areas of the central and southern North Sea being periodically exposed as a terrestrial environment (Figure 12.1-2). This is represented in the geological record, with distinct terrestrial landscape features being present, interspersed with deposits of marine and glacially derived sediments.

Due to the fluctuating glacial cycles, the corresponding rises and falls in eustatic sea level, and major reconfigurations of the landscape during the last million years, the archaeological record is phased between periods of occupation and long periods of hiatus when environmental conditions or high sea levels restricted access to Britain (Figure 12.1-2). These changes in relative sea level are recorded as Marine Isotope Stages (MIS).

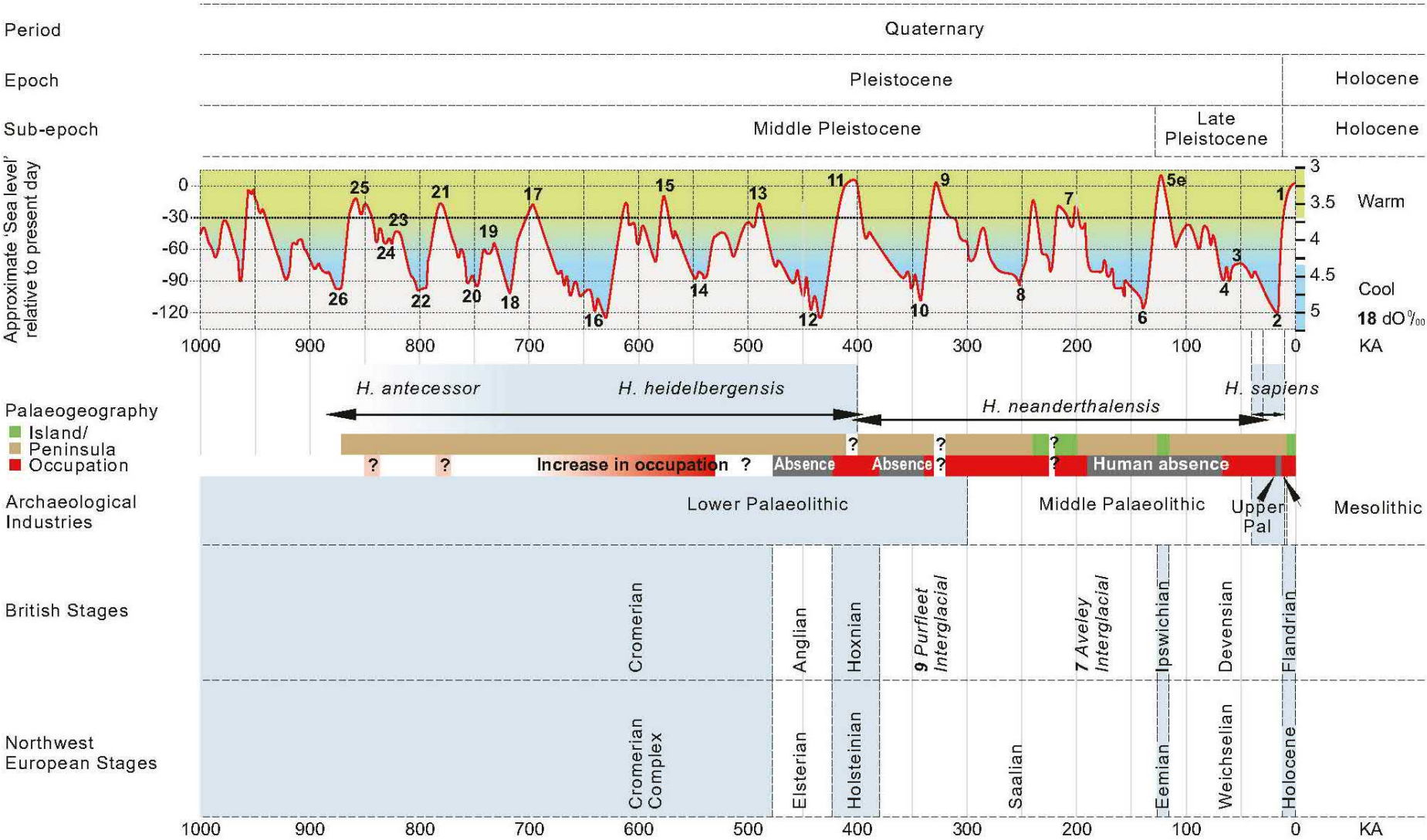
¹ A millennium, a period of one thousand calendar years.

The southern North Sea is known to contain relatively well preserved palaeolandscape features such as fluvial channels, created during periods of sea level lowstand but while the landscape was still free of ice. The remains of this terrestrial landscape are frequently recovered by dredging and fishing in numerous areas around the southern North Sea, generally in the form of the remains of extinct megafauna (e.g. mammoths, bison, horse etc.).

The discovery of actual human artefacts, such as hand axes and worked bone, is a rarer occurrence, but artefacts have been recovered. Reported finds from offshore activity have, to date, produced a range of early prehistoric lithic artefacts indicating early prehistoric activity in submerged palaeolandscapes from Lower, Middle, and Upper Palaeolithic periods (Tizzard, et al., 2014) (Wessex Archaeology, 2011a) (Wessex Archaeology, 2013a), with notable collections of more recent Mesolithic artefacts from submerged palaeolandscape contexts (Momber, et al., 2011) (Wessex Archaeology, 2013b)

Preserved palaeolandscape features and their potentially associated finds are rarer further north within the North Sea, due to repeated reworking of the landscape in this area by ice sheets. However, such features do still survive in shallower water, such as nearshore/intertidal sites and on bathymetric highs such as Dogger Bank.

The following timeline is a summary of the broader southern and central North Sea region to place the archaeological potential of the study area in a wider context; not all information will be directly relevant to the study area itself.



TITLE

Figure 12.1-2
Sea level curve and chronology
of the southern North Sea

REFERENCE

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

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Pre- Anglian (>478 ka; >MIS 12)

Prior to the Anglian glaciation, an extensive estuarine / deltaic landscape existed at the location of the current North Sea basin. This landscape, the Ur-Frisia delta (Cameron, et al., 1992), drained many major European rivers, including the Bytham/Ingham palaeo-river (Rose, 2009) (Westaway, 2009), the palaeo-Thames-Medway system, which drained northwards through Essex and East Anglia (Bridgland, 1994), as well as the Rhine (Hijma, et al., 2012).

The pre-Anglian period represents a significant amount of the Lower Palaeolithic (c. 970,000 to 300,000 BP, >MIS 9). The earliest direct evidence for hominin activity in the UK has been identified at the Lower Palaeolithic sites of Happisburgh, on the Norfolk coast, and Pakefield, on the Suffolk coast, which date from c. 900,000 and 700,000 BP respectively (Parfitt, 2005) (Parfitt, et al., 2010). These sites would have been situated on the edge of an extensive landscape of low-lying estuaries, major river systems, plains and rolling hills. It was a rich, diverse and productive landscape like any contemporary example, and should not be considered as a temporary land-bridge or intermittent linkage to continental Europe (Coles, 1998).

The importance of these sites is international, as they are currently unique at this latitude for this early date (Wessex Archaeology, 2013b). (Cohen, et al., 2012) have highlighted the North Sea basin as a key region for understanding Pleistocene hominins within a northerly, coastal environment. The east of England, particularly East Anglia, but also the south-east of England, are important regions for Lower Palaeolithic archaeology in the last 500,000 years during MIS 13 and 11 (Hoxnian interglacial, Figure 12.1-2) (Wymer, 1999) (Pettitt & White, 2012).

Anglian to Ipswichian (c. 478 ka – 115 ka; MIS 12 – 5e)

The Anglian glacial period was the most extensive glaciation of the Pleistocene and saw ice sheets extending further south than at any time in the past 2.5 million years. The advancing ice sheets gradually pushed the courses of major rivers further south, until they eventually reached their approximate current positions. During this period the study area will have been completely covered by ice, and the climate around the remaining ice-free areas of the UK would have been too cold for hominin habitation.

During deglaciation and retreat of the ice sheet at the end of the Anglian, it is thought that the emptying of an ice-dammed lake within the North Sea created a volume of water large enough to breach a chalk ridge across the eastern end of what is now the English Channel. This connected the North Sea to the English Channel, incising the Lobourg Channel off the Kent coast and some of the English Channel palaeovalleys in the process (Hamblin, et al., 1992) (Gupta, et al., 2017).

The breaching of the Weald-Artois ridge had a major impact on the palaeogeography of Britain, turning Britain from an island at times of high sea level, to a peninsula of Europe when sea levels dropped. In periods associated with lower sea levels since the Anglian, the Lobourg Channel is likely to have formed the main drainage route of the major northern European rivers flowing into the dry North Sea Basin (Cameron, et al., 1992). During periods of lowered sea levels, these river systems, including the Thames, Medway, Great Ouse, and palaeo-Yare, extended across these now submerged landscapes, resulting in cyclical deposition of associated terrace and flood plain deposits laid down in relation to relative sea level (Wessex Archaeology , 2010).

During the interglacial periods between the Anglian and Devensian glaciations (Hoxnian and Ipswichian), warmer climate conditions meant the UK was again available to be recolonised by hominin communities. The foreshore, cliffs and hinterland at Clacton-on Sea (Essex) comprise an important Middle Pleistocene site and is a designated geological Site of Special Scientific Interest (SSSI). Channel sediments from the area are also an important site for the Lower Palaeolithic Clactonian flint industry and have yielded a rare wooden spear alongside lithic artefacts. The site dates from the Hoxnian interglacial period (MIS 11, c. 423,000 - 380,000 BP, Figure 12.1-2) (Sumbler, 1996), and the type site for the Hoxnian (the Hoxne Brick Pit) is located a relatively short distance inland outside of Diss, Suffolk.

During the Saalian glaciation (MIS 10, Figure 12.1-2) there was a hiatus in hominin activity in Britain (Pettitt & White, 2012). When hominins returned, *H. neanderthalensis*, they brought a new lithic technology: the Levallois prepared core technique developing from MIS 9, c. 300,000 BP (Scott & Ashton, 2011). They were hunters adapted to a 'mammoth steppe' environment (Ashton & Lewis, 2002).

The international importance of Early Middle Palaeolithic archaeology in the southern North Sea is highlighted by the numerous sites preserved along the south-east of England (White, 2006) (Scott, et al., 2011) and, in particular, by the submerged prehistoric Levallois lithic assemblage from marine aggregates licence Area 240 in the palaeo-Yare catchment. A substantial number of artefacts have now been recovered from this locale, some of which are identifiable as Levallois, with many recovered from in situ or near in situ contexts (Wessex Archaeology, 2013a) (Wessex Archaeology, 2013b) (Tizzard, et al., 2014) (Tizzard, et al., 2015).

The substantial, mixed assemblage of handaxes also recovered from Area 240 may be of older Lower Palaeolithic origin (e.g. >MIS 9, Figure 12.1-2), or may date to the Later Middle Palaeolithic when technologically similar artefacts were made (c. MIS 3, Figure 12.1-2) (Boismier, et al., 2012). However, based on palaeoenvironmental and sedimentological evidence an Early Middle Palaeolithic date is most likely (Tizzard, et al., 2015).

Palaeogeographically, Area 240 is one of the most northerly Neanderthal sites in north-west Europe and of primary archaeological importance for defining Middle Palaeolithic potential and the contemporary palaeogeography across the southern North Sea basin (Tizzard, et al., 2014). The site highlights the archaeological potential of preserved Pleistocene fluvial deposits within the southern North Sea.

South of the study area, part of a Lower Palaeolithic (Achulean) hand axe was discovered at South Gare, near Redcar (Rowe, 2007), which represents the first and only Lower Palaeolithic artefact discovered in this area. However, it should be noted that it may not be in its primary context and may have been eroded from offshore deposits within the North Sea Basin or redeposited through 19th century dredging and ballast (Wessex Archaeology, 2021). The most northerly palaeolithic record in the English Heritage archives is related to a 'quartzite implement', which was recovered in 1927 from a gravel bed in Limehouse Gill, County Durham (Wessex Archaeology, 2015).

Devensian to Late Glacial Maximum (c. 115 ka – 18 ka; MIS 5d – 2)

Deterioration of the climate during the Late Pleistocene resulted in the most recent glaciation of the North Sea during the Devensian period. Currently there is no definitive evidence of a hominin presence in Britain during MIS 5 (Lewis, et al., 2011), and the study area would again have been completely covered by ice during this period.

Within the context of early prehistory and submerged palaeogeography however, substantial areas of the southern North Sea basin would have been dry land during the warming and cooling limbs of the various sub-stages (MIS 5a to 5e, Figure 12.1-2). Recent analysis has suggested that eight relatively brief phases of human activity within the UK are represented by the existing Upper Palaeolithic archaeological record (Jacobi & Higham, 2011), with six occurring before the Devensian glacial maximum. Therefore, the potential exists for human activity to have occurred in Doggerland, the area of exposed terrestrial environment within the southern North Sea basin, during and after the Devensian glaciation.

Again, East Anglia provides early evidence for Neanderthal recolonisation of Britain after the hiatus between MIS 6 to 4, around 60,000 BP (Figure 12.1-2). The Lynford Quarry material highlights a new lithic technology visually similar to Lower Palaeolithic Acheulean lithics, so-called Mousterian of Acheulean Tradition handaxes and tools (Boismier, et al., 2012).

Climatically, MIS 3 was significantly colder than now but did not attain the glacial conditions of later or earlier glacial periods (e.g. MIS 6 or 2, Figure 12.1-2) (Pettitt & White, 2012). For the Neanderthals that may have occupied the region at this time, surviving in Doggerland during this period may have been subject to a variety of technological and cultural adaptations (White, 2006). Whilst sediments from this period do still exist within the wider North Sea region, erosion of upper layers of deposits by the Devensian glaciation significantly reduces the potential for archaeological material of this age remaining on the seabed further north within the North Sea basin.

Post-Late Glacial Maximum and early Holocene (18,000 – 6000 BP; MIS 2 – 1)

Following the Devensian glacial maximum, ice sheet retreat once again left significant areas of the southern and central North Sea exposed as a terrestrial environment, with deposition of fluvially derived sediments continuing from the Late Pleistocene into the Early Holocene.

In the Early Upper Palaeolithic, at the end of the Late Pleistocene, there was a transition period for hominins. Neanderthals died out around 40,000 BP, and modern humans then colonised Doggerland, arriving in Britain around 34,000 BP (Jacobi & Higham, 2011) (Bicket & Tizzard, 2015). Archaeological evidence for this period is relatively sparse, but submerged palaeolandscapes provide key contextual evidence for recovered artefacts and provides a background landscape within which to place these human communities.

During the Last Glacial Maximum (LGM), the environment within the southern North Sea was relatively poor for human colonisation and was situated at the north-western extents of possible habitation. However, there was increasing human exploitation after 15,000 BP. Humans at this time were hunting game, such as mammoth and deer, and evidence of these animals has been reported through marine aggregate dredging, and the associated reporting requirements (Bicket & Tizzard, 2015).

The onshore archaeological record of Upper Palaeolithic activity is relatively sparse, and offshore locations may provide unique and important context for coastal and lowland human activity during this period (Wessex Archaeology, 2013b). For example, a Maglemosian harpoon artefact from trawled peat in the early 20th century was subsequently radiocarbon dated to around 12,000 years ago (Housley, 1991), and archaeological and palaeoenvironmental material has been reported from North Sea contexts for over a century (Reid, 1913) (Godwin & Godwin, 1933).

Landscape features and archaeological evidence do survive off East Anglia, as the area is thought to have only experienced one glacial advance during the Pleistocene. However, the region of the North Sea north of Norfolk has experienced a number of major glacial events, and, as such, much of the evidence for past landscapes is likely to have been adversely affected by the associated glacial erosion and deposition of till (Tappin, et al., 2011). This certainly seems to be the case over much of this area of the North Sea, as the shallow Pleistocene geology is dominated by infilled glacial valleys (such as the Swarte Bank Formation) and extensive deposits of glacial till (such as the Bolders Bank Formation and Wee Bankie Formation) (Cameron et al. 1992, (Gatliff, et al., 1994).

However, it is clear from numerous research and development-led investigations that postglacial marine transgression has not destroyed Pleistocene and Holocene palaeogeography by default (Wessex Archaeology, 2013a). Areas of preserved palaeogeographic features do remain, and detailed reconstructions of palaeoenvironments and palaeogeography can be achieved for large parts of the North Sea basin (Tappin, et al., 2011) (Limpenny, et al., 2011) (Dix & Sturt, 2011)

In a terrestrial context, Upper Palaeolithic activity has been recorded in the north-east of England at Prudhoe Farm and possibly at Towler Hill in Teesdale (Petts, et al., 2006). Upper Palaeolithic finds have also been found in other glaciated areas, such as Howburn Farm, South Lanarkshire, in Scotland (Ballin, et al., 2010), demonstrating the potential for such material in these types of glaciated landscapes. It is noted in Wessex Archaeology (2015) that the coastal strip moving north to Northumberland is a key palaeogeographical zone which not only links the onshore and offshore archaeological records, but also represents an area of merging routes through the southern North Sea basin into northern England and Scotland, during both the Later Upper Palaeolithic and the Mesolithic. It is also thought that larger valleys such as the Tweed may have served as routeways in and out of the North Sea Basin (Wessex Archaeology, 2015).

The Mesolithic period began in the early Holocene. Around 10,000 BP, sea levels were still more than 60 m below current levels, and during this period, an extremely large area of the central and southern North Sea and English Channel was dry land, suitable for human occupation.

Evidence of this environment has been identified from the foreshore at Jaywick, Essex, where layers of peat dating from the Early Holocene are present along with a preserved land surface from which Mesolithic artefacts have been recovered (Wilkinson & Murphy, 1995). The important Mesolithic site of Star Carr is located in North Yorkshire, only approximately 10 km from the North Sea coast. Closer to the study area, a number of Mesolithic sites are known from the modern Northumbria coast, including Howick, Low Hauxley, and flint scatters at Newbiggin-By-Sea and Lynemouth (Wessex Archaeology, 2020). In addition, 'submerged forests' have also previously been identified close to the study area at South Beach, Blyth, during an unusually low tide in 2014 (Wessex Archaeology, 2020), and at Low Hauxley, which has been linked to contemporary Mesolithic activity (Wessex Archaeology, 2015). Submerged peats have also been identified south of the study area in Hartlepool where organic peats

and megafaunal remains, including a Southern Mammoth vertebra, were discovered suggesting that, although securely provenanced Upper Palaeolithic archaeology has yet to be discovered, the environmental conditions suggest there is the potential for the preservation of late glacial human activity within this area (Wessex Archaeology, 2021).

By the early Holocene, Mesolithic hunter-fisher-gatherers in Doggerland were active in a familiar ecosystem of mixed deciduous woodland with oak, elm, alder and lime populated by deer and a wide variety of other mammals (Tappin, et al., 2011).

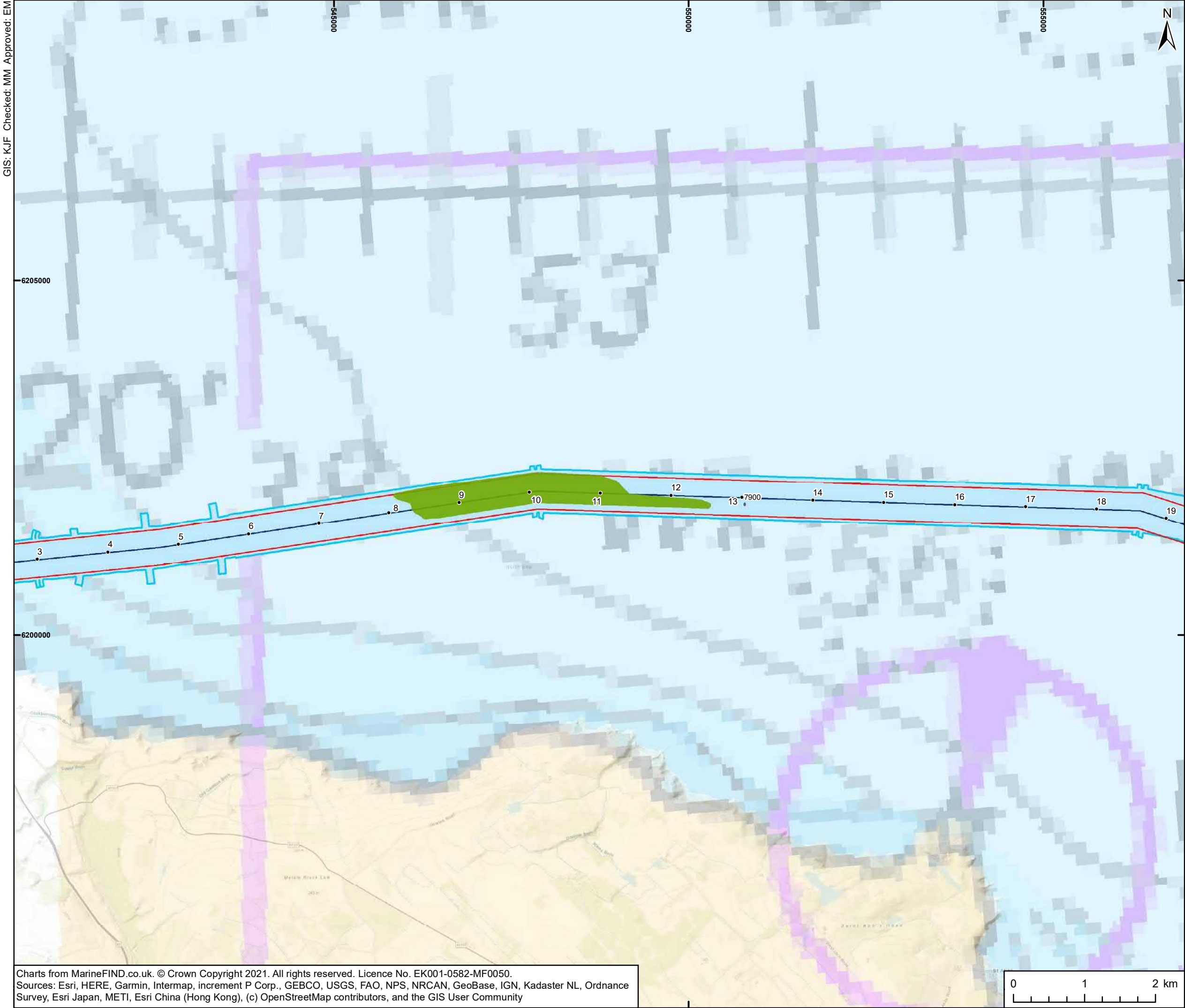
Considerable attention has been paid to Mesolithic Doggerland in the last decade (Gaffney, et al., 2007) (Tappin, et al., 2011) and the geoarchaeology (Boomer, et al., 2007), submerged forests (Hazell, 2008), and palaeo-river systems around the current North Sea coast (Wessex Archaeology 2013b, (Limpenny, et al., 2011) (Emu, 2009). Increasingly, a maritime perspective has developed for understanding the early prehistoric archaeological record, where coasts, estuaries and wetlands are key landscape elements (Ransley, et al., 2013). Other key Mesolithic sites are located along the north-east coast such as Seamer Carr, East Barns, Cramond, as well as Echline, Firth of Forth, where one of the oldest Mesolithic structures in the British Isles has been discovered (Wessex Archaeology, 2015). Mesolithic lithic scatterings and flint flakes have also been identified on Holy Island and the Farne Islands (Wessex Archaeology, 2015).

Investigations have shown that during the early Holocene, the coast in Northumberland was at least 1 km east of Howick around 8,000 years ago (Wessex Archaeology, 2015). Between 7,000 and 5,000 BP, much of the land was inundated by eustatically driven sea level change (Bicket & Tizzard, 2015), and by 6,000 BP sea level was only approximately 7 m below the present level (Cameron, et al., 1992). Around this time, Britain became an island again (Coles, 1998), although, due to its more northern location, the study area will have been mostly inundated before this time; potentially around 8,000 BP, with the exception of the most nearshore section (Shennan, et al., 2018). Settlements at the time were often transitory and seasonal, and therefore leave little trace in the archaeological record, however, new types of stone tools were introduced during this period.

The marine transgression resulted in the deposition of sands, gravels and muds, which represent the modern marine sediment, but can also incorporate reworked sediment from the underlying Pleistocene deposits. Post the Holocene marine transgression, the archaeological potential of the North Sea, including the study area, shifts to the maritime history of the UK (see Section 12.4.2.5 and 12.4.2.7).

12.4.1.2 Paleogeographic Assessment Results

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 Appendix B, and their distribution is illustrated in Figure 12.1-3a-f.



PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - Extents of the St Andrews Bay member
 - Acoustic Blanking



TITLE
**Figure 12.1-3a
Palaeogeographic features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
1 of 6

DATE
27/04/2022

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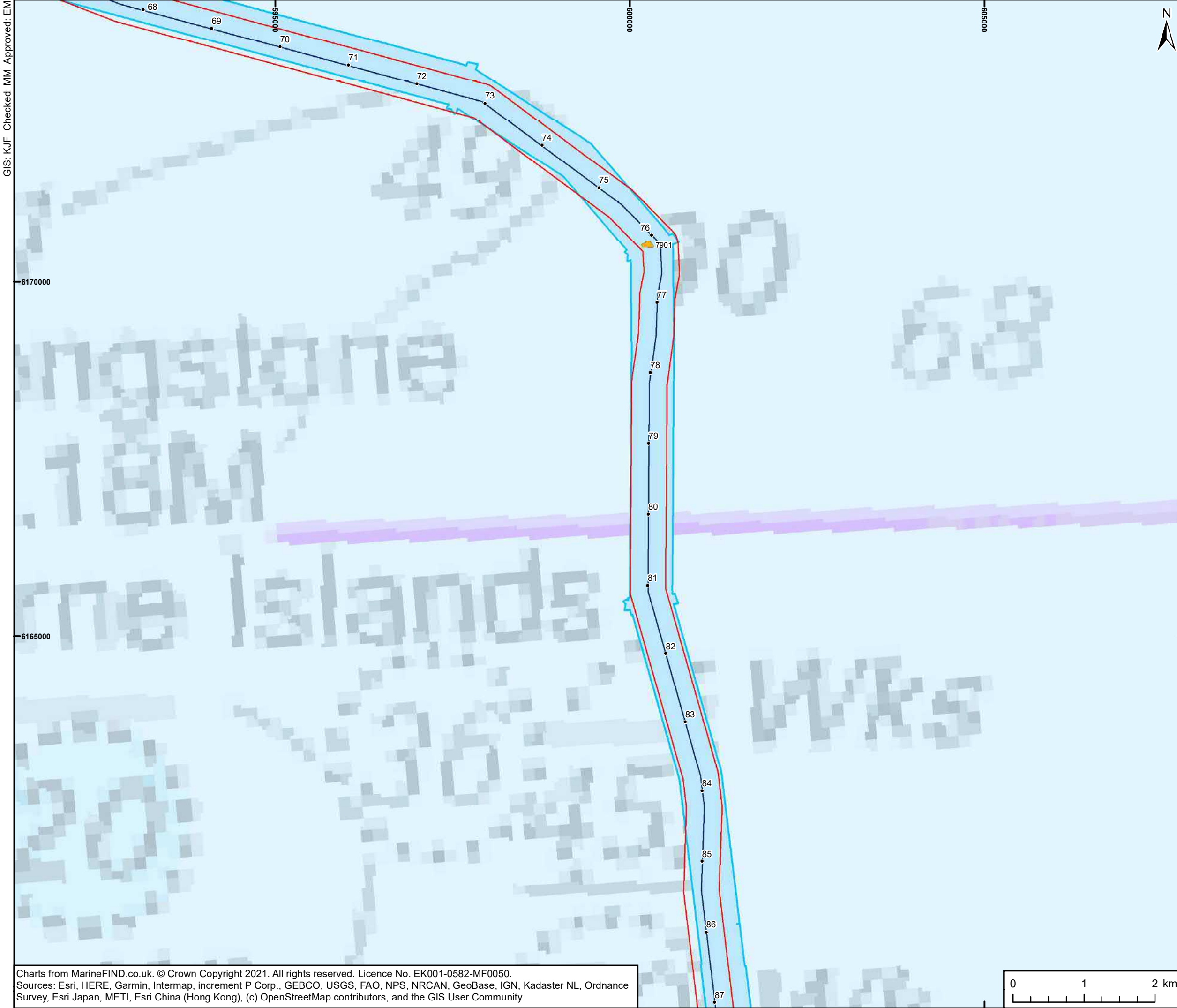
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - Cut and Fill



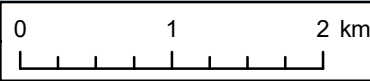
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**Figure 12.1-3b
Palaeogeographic features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

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DATE 27/04/2022

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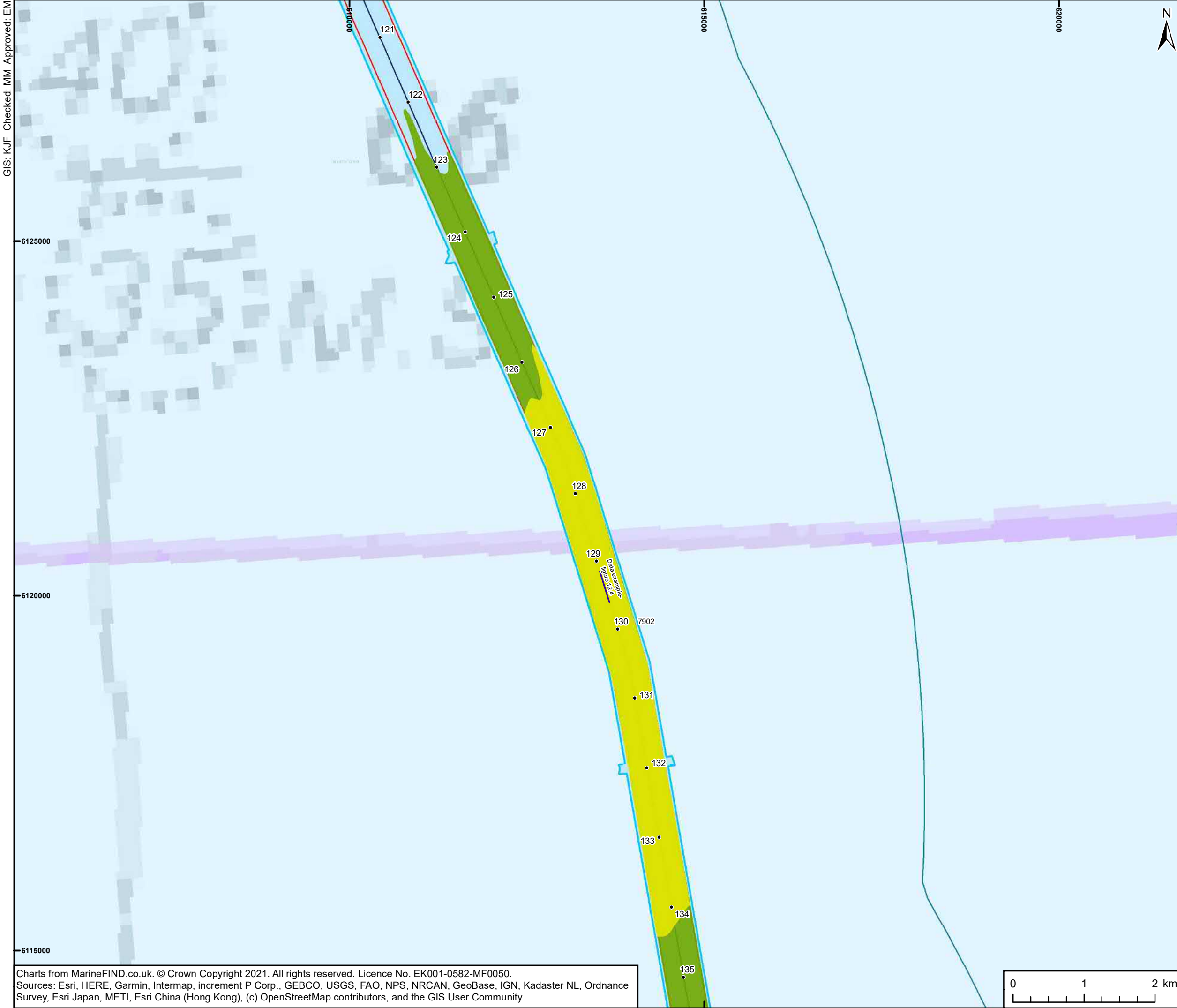
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - Data example location
 - Extents of the St Andrews Bay member
 - Dune features



TITLE
**Figure 12.1-3c
Palaeogeographic features of
archaeological potential**

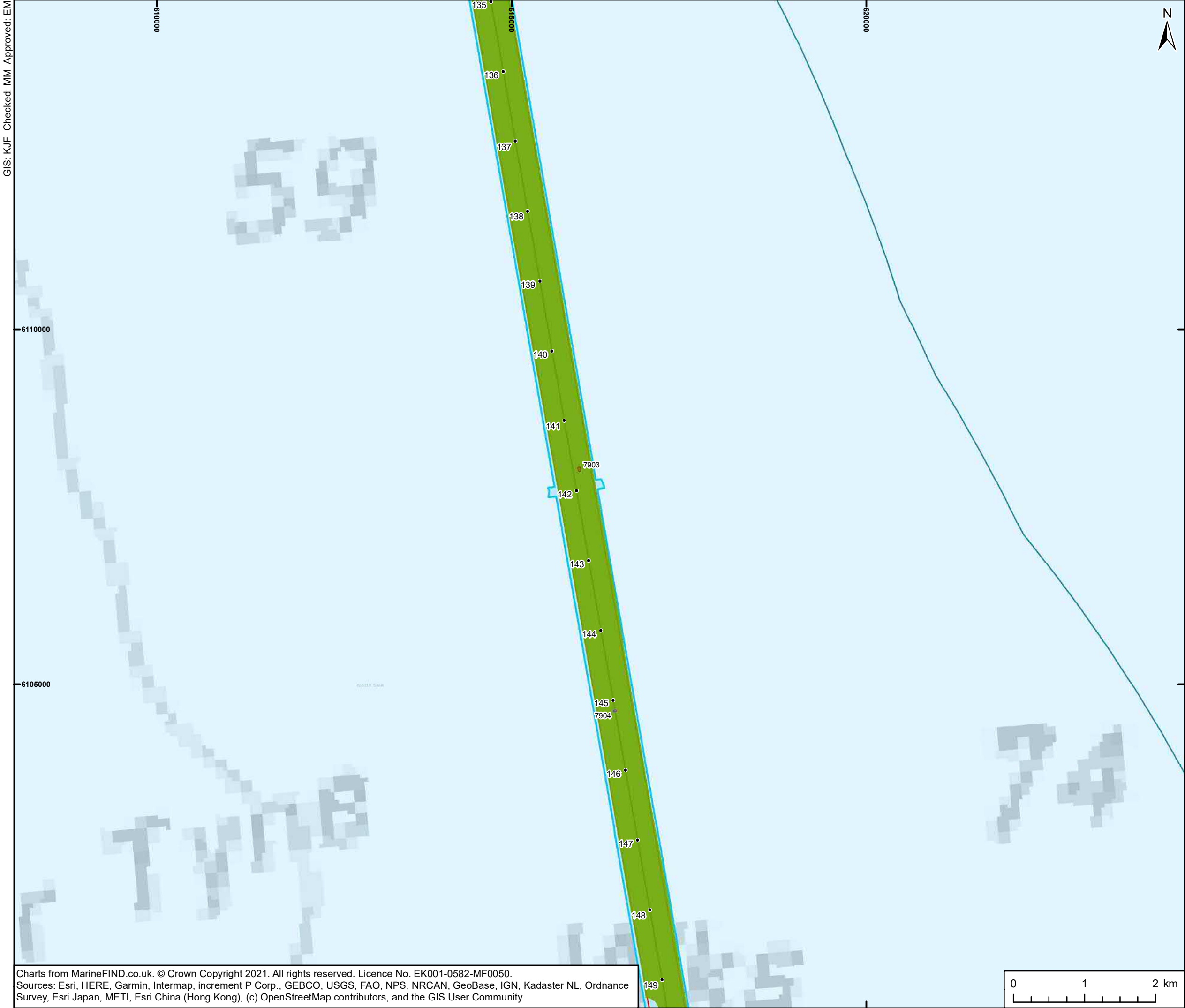
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3 of 6

DATE
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - Extents of the St Andrews Bay member
 - High amplitude reflector
 - Fine-grained deposit



TITLE
**Figure 12.1-3d
Palaeogeographic features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

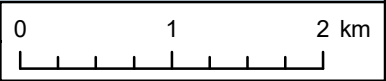
SHEET NUMBER
4 of 6

DATE
27/04/2022

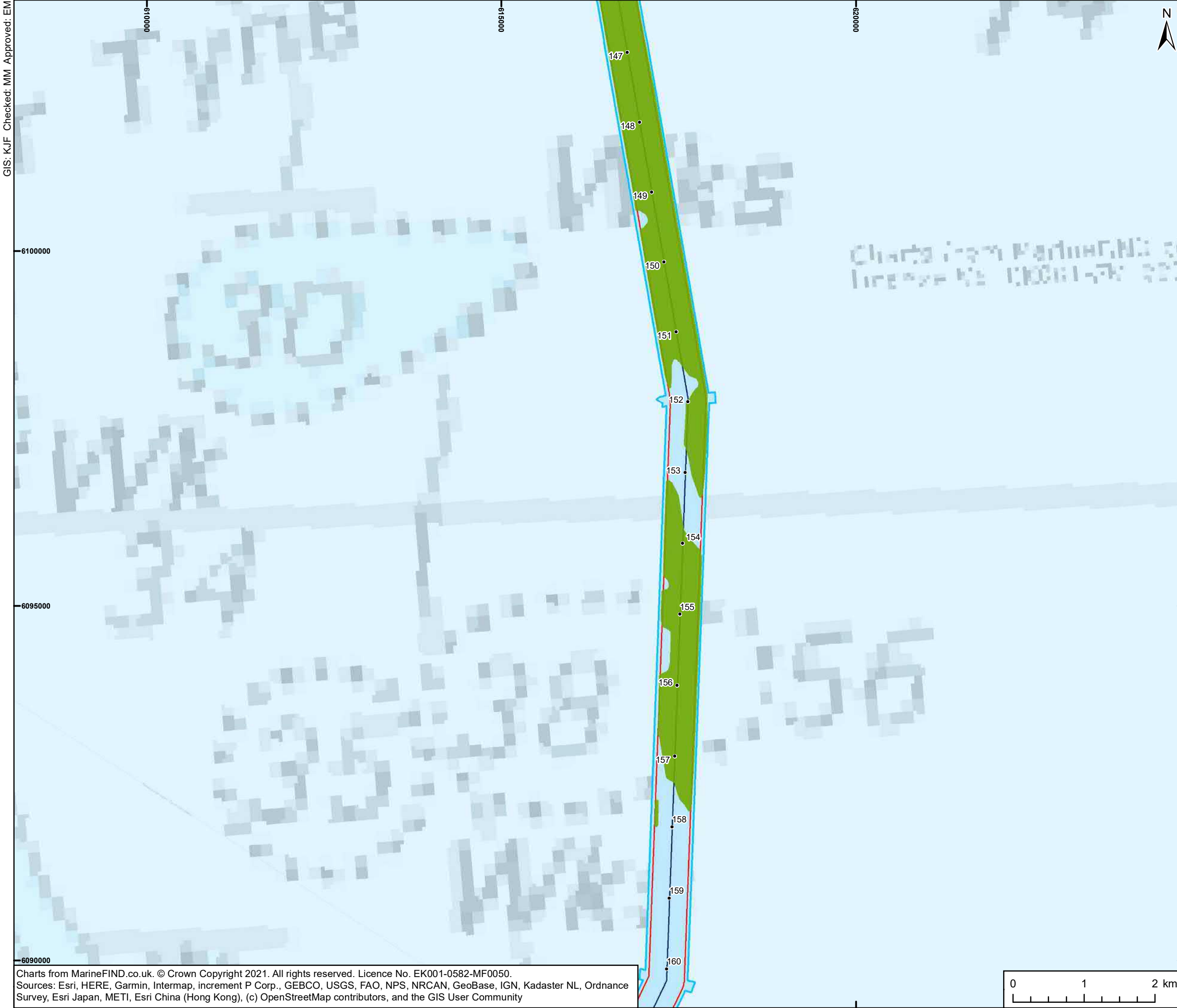
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - Extents of the St Andrews Bay member



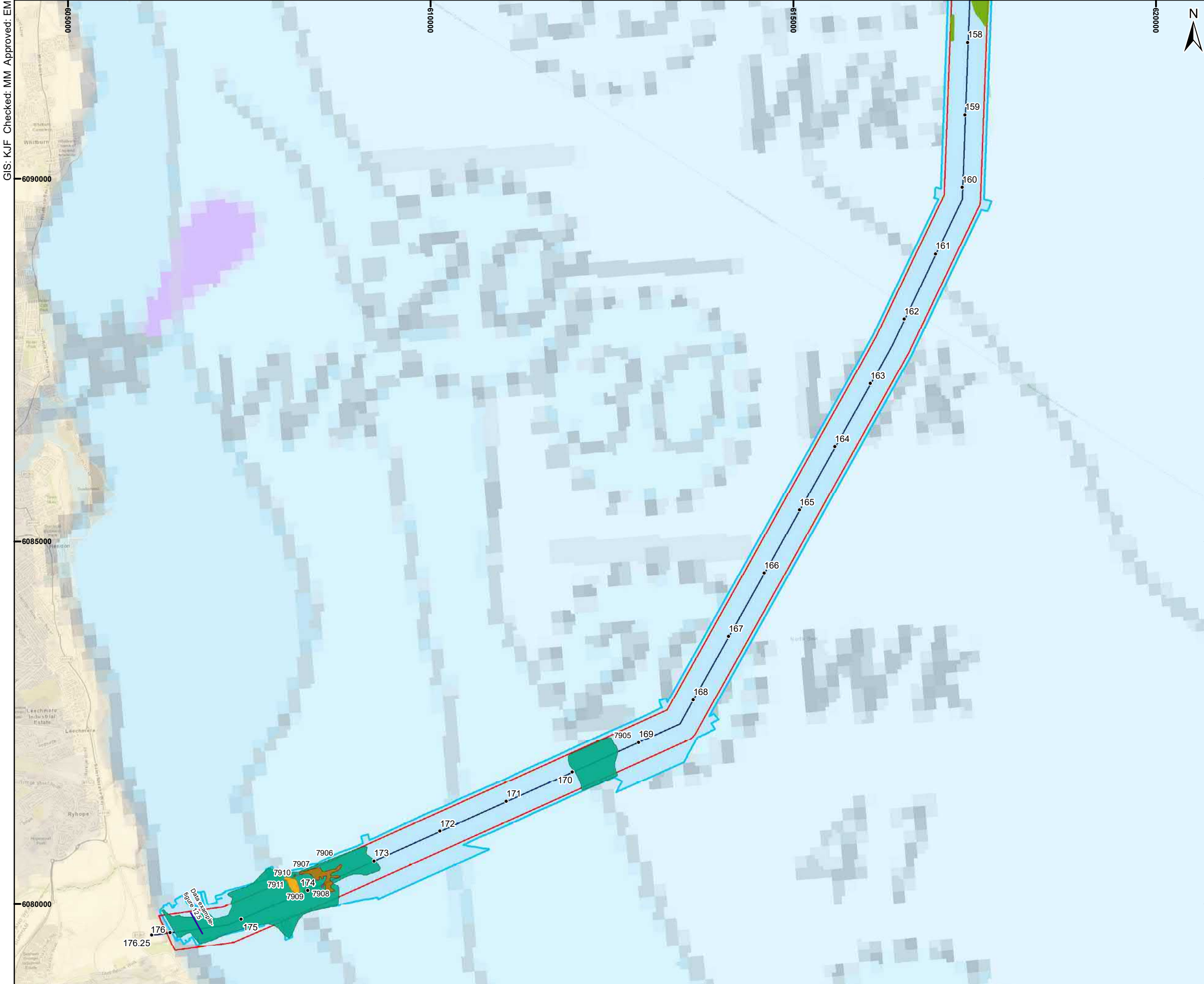
TITLE
**Figure 12.1-3e
Palaeogeographic features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
5 of 6

DATE
27/04/2022

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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - Data example location
 - Extents of the St Andrews Bay member
 - Cut and Fill
 - Infilled depression
 - Fine-grained deposit



TITLE
**Figure 12.1-3f
Palaeogeographic features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
6 of 6

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27/04/2022

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The interpreted geology within the study area has been divided into 7 phases, as described in Table 12-6.

Table 12-6: Shallow stratigraphy of the study area

Unit	Unit Name	Geophysical Characteristics ⁽¹⁾	Sediment type ⁽²⁾	Archaeological potential
5b	Holocene Seabed Sediments (post-transgression) (MIS 1)	Generally observed as a thin veneer across the study area. Boundary between surficial sediments and underlying units not always discernible.	Variable, generally clayey silty sand with gravel	Considered of low potential in itself, but possibly contains re-worked artefacts and can cover wreck sites and other cultural heritage in areas with sufficient thickness.
5a	Holocene Sediments (pre-transgression) (MIS 2 to 1)	Shallow infilled cut and fills with fill characterised by sub-parallel internal reflectors, and possibly occasionally with unstructured fill.	Fluvial, estuarine and terrestrial deposits, generally extremely low to medium strength silty sandy clay.	Potential to contain in situ and derived archaeological material, and palaeoenvironmental material.
4b	Forth Formation, St. Andrews Bay member (Late Devensian/Early Holocene) (MIS 3 to 1)	Acoustically transparent/unstructured unit with occasional point contacts.	Interbedded sand and clay, fluviomarine and estuarine	Potential to contain derived archaeological and palaeoenvironmental material, and to protect underlying surfaces.
4a	Forth Formation, Largo Bay member (Late Devensian) (MIS 3 to 2)	Distinct unit characterised by parallel internal reflectors	Silty sandy muds, marine/glaciomarine deposits.	Basal contact may cover old land surfaces, but fill unlikely to contain artefacts.
3	St Abbs Formation (Late Devensian) (MIS 3 to 2)	Acoustically unstructured with occasional weak layering. Not definitively identified in the SBP data.	Glaciomarine sediments- muds and clays with small pebbles	Unlikely to contain archaeological material.
2	Wee Bankie Formation (Devensian) (MIS 3)	Acoustically chaotic/unstructured unit	Glacial lodgement till	Unlikely to contain archaeological material.
1	Pre-Quaternary bedrock (Carboniferous - Permian)	Acoustically unstructured, with distinct upper reflector.	Various depending on age	Pre-Earliest occupation of the UK
⁽¹⁾ Based on geophysical data				
⁽²⁾ Based on Gatliff et al. 1994 and Fugro 2021c				

The oldest interpreted unit within the study area is Unit 1, which comprises the solid pre-Quaternary bedrock for the region. This is seen in the nearshore areas to outcrop regularly at seabed. This is then overlain by deposits of younger formations as the proposed route moves offshore, although may be present at, or just below, the seabed at numerous places within the study area.

As formations of Carboniferous and Permian age, these are not considered of archaeological potential. However, their upper surfaces may have once been exposed as a terrestrial land surface upon which archaeological material could have been deposited.

There is a large hiatus between the pre-Quaternary bedrock of Unit 1 and the overlying Unit 2, which is represented by the Wee Bankie Formation; a glacial till deposit of Devensian age. It is identified in the SBP data as an acoustically unstructured, occasionally chaotic unit overlaying the bedrock. BGS information (Gatliff, et al., 1994) suggest it is a lodgement till, and so was deposited beneath the Devensian ice sheet. As such, Unit 2 is not considered to be of archaeological potential.

Unit 3, interpreted as the St Abbs Formation, is expected to be present intermittently in the study area. It is generally characterised as a relatively acoustically quiet/unstructured unit with occasional parallel sub-horizontal reflectors observed. As a glaciomarine deposit, it is not considered to be of archaeological potential.

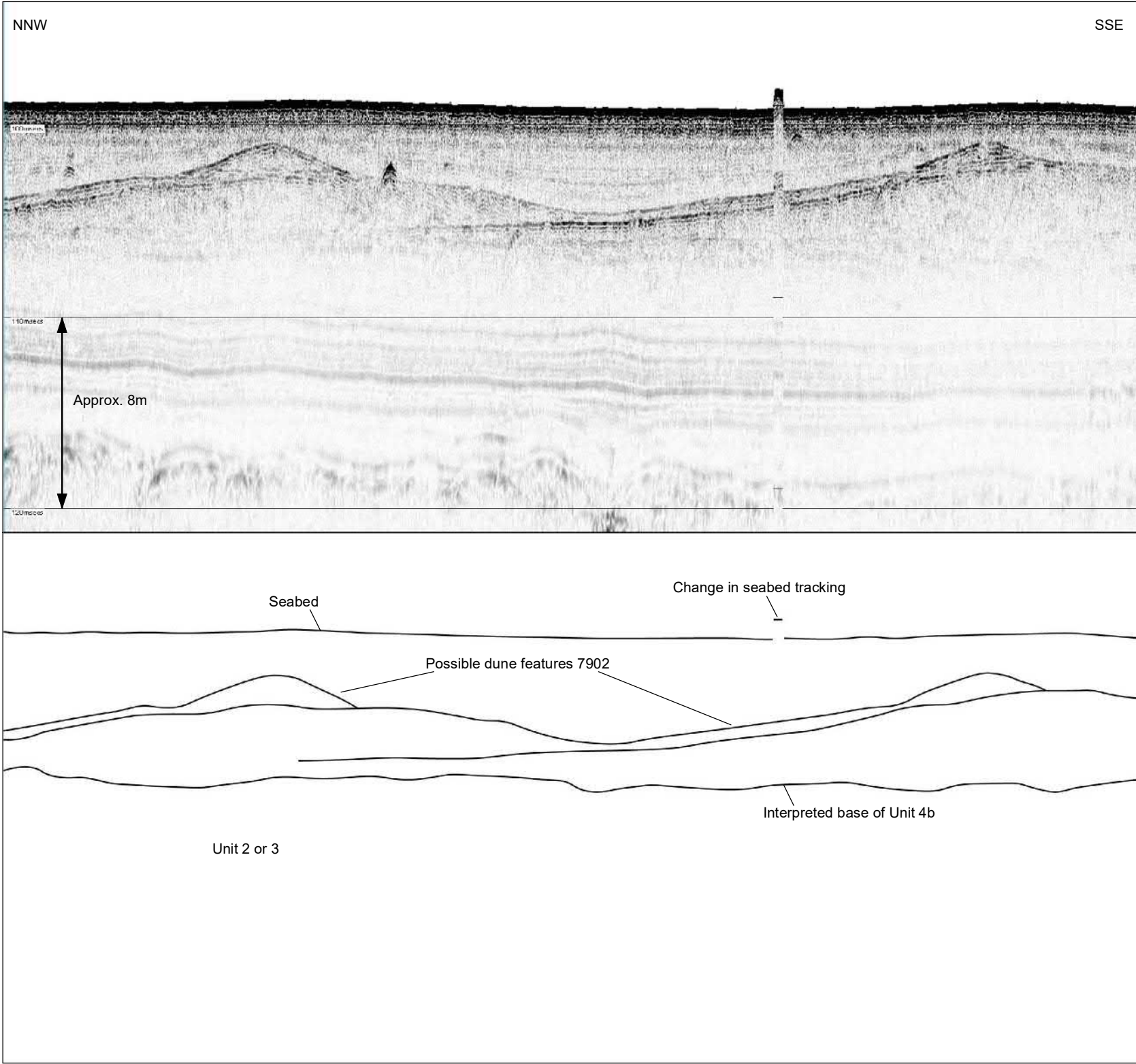
Unit 4 has been identified throughout much of the southern, offshore section of the study area. This is interpreted as the Forth Formation and has been divided into two distinct members.

Unit 4a, the lower member, is generally characterised within the SBP data by well-defined parallel internal reflectors. This has been interpreted as the Largo Bay member of the Forth Formation; a glaciomarine deposit of Late Devensian age. As an ice proximal, marine deposit, Unit 4a is not considered to be of archaeological potential.

An area of acoustic blanking is identified within the interpreted Unit 4a (**7900** (KP 13)). The feature is seen to disrupt the surrounding horizons and coincides with a possible pockmark at the surface, which may suggest that it is a fluid or gas escape feature. The presence of shallow gas may indicate the microbial breakdown of organic matter, although it appears that the feature may have originated from either the base of the Largo Bay Member of the Forth Formation, or the underlying till (Unit 2 or 3), neither of which are considered of archaeological interest based on their depositional environment. Therefore, the feature is not definitively of palaeo-environmental or archaeological interest. However, as its origin is not certain and it appears anomalous in comparison with its surroundings, the feature has been retained as a precaution.

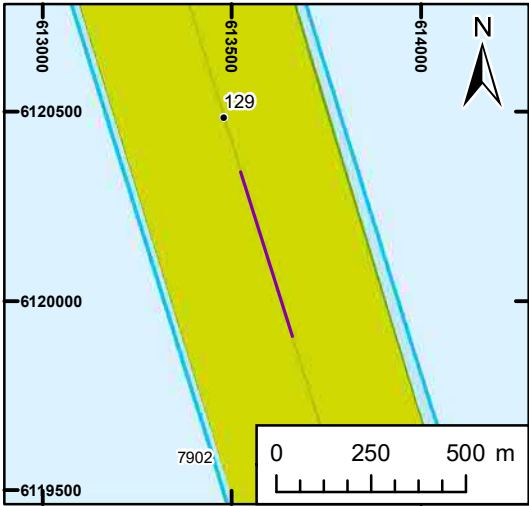
Unit 4a is overlain by an acoustically unstructured deposit containing occasional point contacts, interpreted as the St. Andrews Bay member of the Forth Formation (Unit 4b). This member, interpreted as comprising interbedded sands and clays of fluvio-marine and estuarine origin (Gatliff, et al., 1994), is of Early Holocene age. As such, Unit 4b is interpreted as of medium archaeological potential, and has the potential to contain derived artefacts and/or paleoenvironmental material. However, as it is an extensive deposit rather than an individual feature of interest, the extents have been mapped and presented in Figure 12.1-3a-f, but it has not been given its own anomaly number at this time. It should be noted that only the larger, more extensive areas of Unit 4b have been mapped. It is likely that there are small, localised areas of Unit 4 throughout the study area which have not been mapped due to them being smaller and similar in acoustic properties to some of the other units identified and therefore and less certain.

An area of numerous mounds, possibly representing a pro-grading shoreline or dune features (**7902** (KP 127)), has been identified at the base of Unit 4b, overlying Unit 4a (Figure 12-4). These are identified in the SBP data as a series of cross-cutting, acoustically unstructured mounded features. Geotechnical sampling suggested that these comprise sand with rare organic matter and rare shell fragments (Furgo, 2021c). These features are interpreted as being possibly terrestrial in origin, however there is the possibility of them being subaqueous in formation. If terrestrial, it may suggest that they formed during a significant period of aerial exposure, likely in a coastal environment, and may protect a buried land surface. As such, these features have the potential of being of palaeo-environmental interest, although at present their origin is uncertain.



PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - Data example location
 - Extents of the St Andrews Bay member
 - Dune features



TITLE
**Figure 12.1-4
Palaeogeographic feature
data example – 7902**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
1 of 1

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27/04/2022

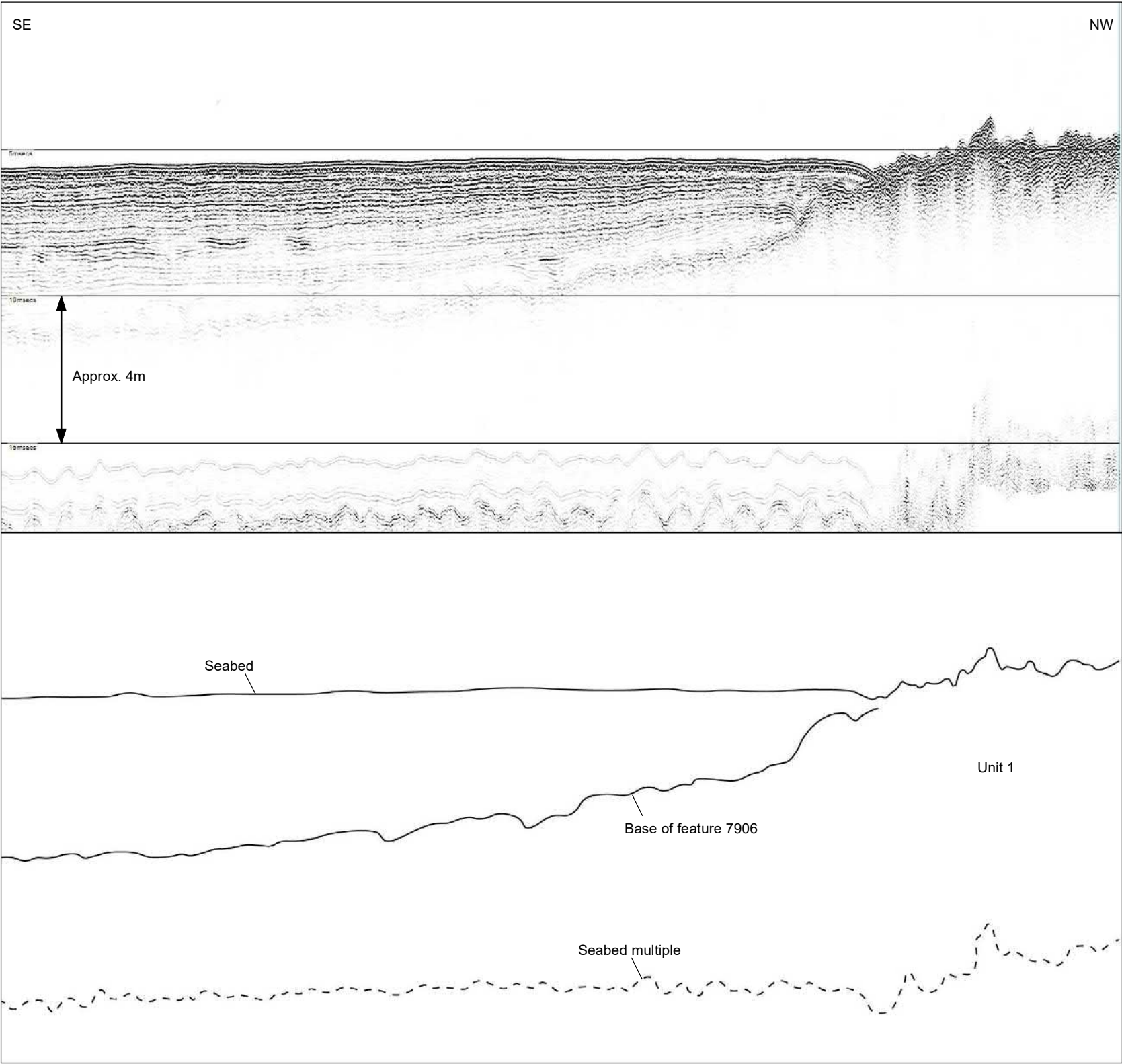
A small area comprising numerous dipping reflectors is identified within Unit 4b (**7903** (KP 142)). This has been interpreted as a possible fine-grained deposit based on its acoustic properties. The feature has no clearly discernible basal reflector, however it appears slightly higher amplitude compared to surrounding sediments which may suggest some organic content, although this cannot be confirmed without further investigation. The feature has been retained as a precaution based on the fact it has the potential to contain sediments of interest; however, it is considered of lower potential based on its uncertain origin.

One slightly higher amplitude reflector (**7904** (KP 145)) is identified within Unit 4b as a slightly chaotic reflector that appears similar in form to shallow gas, but which is not seen to cause any acoustic blanking which is typically associated with gas. It is possible that this may just represent an internal reflector or a re-working of sediments; however, it has the potential to be gas which may have been caused by the microbial breakdown of organic matter. If so, this would suggest there may be some possible sediments of palaeo-environmental interest, likely at the boundary between Unit 4a and 4b where the horizon is seen to be relatively high-amplitude. Based on this, the feature has been retained as a precaution although, due to its uncertain origin, it is considered of lower archaeological potential.

A possible glacial landform is identified within the Scottish sector interpreted as situated beneath Unit 4a and above Unit 2. This was found by geotechnical sampling to comprise loose to dense gravelly sand with pockets and laminae of clay, silt and organic matter, and was interpreted by Fugro as a Drumlin, possibly of Devensian age (Furgo, 2021c). As a possible upstanding landscape feature, this has the potential to have been a desirable place for humans to interact with. However, as this is interpreted as situated beneath Unit 4b which is a glaciomarine deposit, it is unlikely that the feature would have been exposed as a terrestrial feature of interest during a period of human occupation. As such, the feature has not been mapped or given a feature number as part of this report, although its presence should be noted.

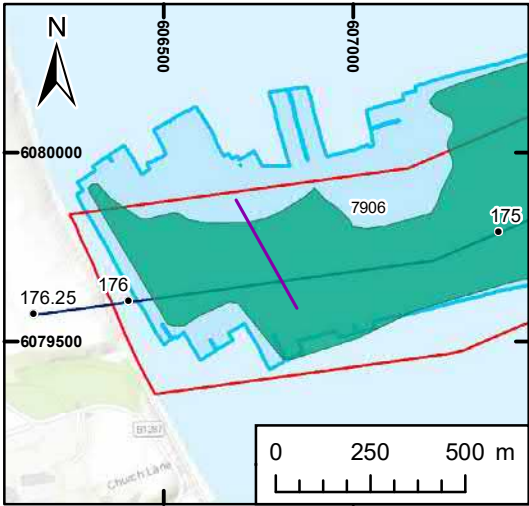
Unit 5 has also been divided into two members. Unit 5a is possibly represented by features **7901** (KP 76), and **7904 - 7910** (KP 145, 170, 173, 174).

Feature **7906** (KP 173) is identified cutting into the pre-Quaternary bedrock at the English landfall end of the study area (Figure 12.1-5). The feature is characterised by a generally well-defined basal reflector and a fill comprising distinct, often sub-parallel internal reflectors in the south-west, becoming more acoustically unstructured in the central and north-eastern section. Some lines of data indicate there may be more than one phase of cut and fill and / or gas blanking within the features in the south-west, but this is unclear. In the north-eastern section of the feature, several deposits characterised by numerous, relatively high-amplitude horizontal reflectors have been identified (**7907 – 7910** (KP 174)), which may represent fine-grained sediments, possibly with some organic content which may be of palaeo-environmental interest. A shallow, secondary cut and fill feature (**7911** (KP 174)) has also been identified cutting into the top of **7906** (KP 173) and may represent a later phase of fill.



PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - Data example location
 - Infilled depression



TITLE
**Figure 12.1-5
Palaeogeographic feature
data example – 7906**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER 1 of 1
DATE 27/04/2022

The origin of **7906** (KP 173) is uncertain; it is possible that it may represent infilling sediments at the top of the bedrock. However, there is the potential of this feature being a remnant fluvial feature of Holocene age, dating from post-LGM but before the Holocene marine transgression (Unit 5a). Considering its position close to the coast, and the possible gas blanking and fine-grained deposits within it, it is considered of medium archaeological potential, as it has the potential to contain preserved palaeo-environmental material and, depending on its origin, the possibility of containing in-situ or derived artefacts. The internal fine-grained deposits (**7907 – 7910** (KP 174)) are considered higher potential based on the possibility of them containing organic material.

A possible infilled depression is identified in the top of the bedrock (**7905** (KP 170)). The feature has a distinct basal reflector overlain by a unit of generally acoustically unstructured fill with some slightly higher amplitude internal reflectors. The feature may represent modern sand infilling a depression at the top of the bedrock and therefore might not be of archaeological or palaeo-environmental interest; however, it appears similar in form to feature **7906** (KP 173) and had the potential of representing a remnant fluvial feature and, as such, it has been retained as a precaution.

Cut and fill feature **7901** (KP 76) is seen to be cutting into an older cut in the top of the bedrock which may be infilled with Unit 2 or 3. The feature is seen to have a poorly defined basal reflector and possibly slightly layered fill, although this is not certain. May represent a fluvial feature of similar age to **7906** (KP 173); however, may also represent an internal feature.

Unit 5b is likely to be present throughout most of the study area, generally as a veneer of <0.5 m thick, and is absent in numerous areas close to landfall (where Unit 1 outcrops at seabed). This is interpreted as the modern, post-transgression seabed sediment, and was found by geotechnical investigations to predominantly comprise silty fine to medium sand with shell and shell fragments (Furgo, 2021c).

Unit 5b is not considered of archaeological potential in itself, but may contain reworked artefacts in a secondary context, and cover archaeological sites (e.g. shipwrecks) where it has been reworked into localised bedforms or attains sufficient thickness.

12.4.1.3 Value

There are no known seabed prehistory sites within the study area. However, there is the potential for the presence of as yet undiscovered in situ prehistoric sites and finds. The values assigned to any potential heritage assets are outlined in Table 12-7.

Table 12-7: Value of seabed prehistory heritage assets.

Asset Type	Definition	Value
Potential <i>in situ</i> 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.	High
Potential submerged landscape features	Other known submerged palaeo-landscape features and deposits likely to date to periods of prehistoric archaeological interest with the potential to contain <i>in situ</i> material.	High
Potential derived prehistoric finds	Isolated discoveries of prehistoric archaeological material discovered within secondary contexts.	Medium
Potential palaeo-environmental evidence	Isolated examples of palaeo-environmental material	Low
	Palaeo-environmental material associated with specific palaeo-landscape features or archaeological material	High

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

In the event that prehistoric archaeological material discovered offshore is found *in situ* it should be considered of particularly high archaeological importance (Bailey, et al., 2020). As such, the features and deposits that have the potential to contain within them *in situ* material should be considered as high value assets.

Prehistoric archaeological material discovered within secondary contexts also has the potential to provide valuable information on patterns of human land use and demography in a field of study that is still little understood and rapidly evolving. They are, however, by their very nature derived and, as such, isolated prehistoric finds should be regarded as medium value assets.

Palaeo-environmental evidence in the context of an *in situ* prehistoric site (if found) will be of high value. More widely, palaeo-landsurfaces and palaeo-landscape features will be considered of high value for the purpose of this appraisal owing to the Quaternary scientific potential of such sedimentary sequences, to contextualise the wider early prehistoric palaeogeography and the potential of palaeo-landscape features to preserve *in situ* artefacts and sites (Bicket & Tizzard, 2015). Palaeo-environmental evidence from isolated contexts will be regarded as low value.

12.4.2 Maritime and Aviation Archaeology

12.4.2.1 Introduction

The following section is based on records of known shipwrecks, aircraft crash sites and obstructions combined with recent archaeological assessment of geophysics data.

12.4.2.2 Designated Sites

There are currently no sites within the ASA 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 legislative acts that could be used to protect marine archaeological sites.

12.4.2.3 Known Maritime and Aviation Sites

There is one charted wreck site located within the marine installation corridor, which has not been identified by geophysical survey datasets. This consists of UKHO record 63946 (**2002** (KP 20)), an unknown fishing vessel (Figure 12-6b). Further detail can be found in Appendix C.

A further nine charted wrecks are located within the wider ASA, which have not been identified by geophysical survey datasets. These are described below.

There are no known aircraft crash sites located within the marine installation corridor. The potential for the discovery of previously unknown shipwreck sites and aircraft crash sites and material is discussed in Section 12.4.2.5 and Section 12.4.2.7.

Scotland

One charted wreck is located within the ASA of the Scottish Territorial Waters, UKHO4496 (**2003**) consisting of the steamship of *Baron Stjenblad*.

England

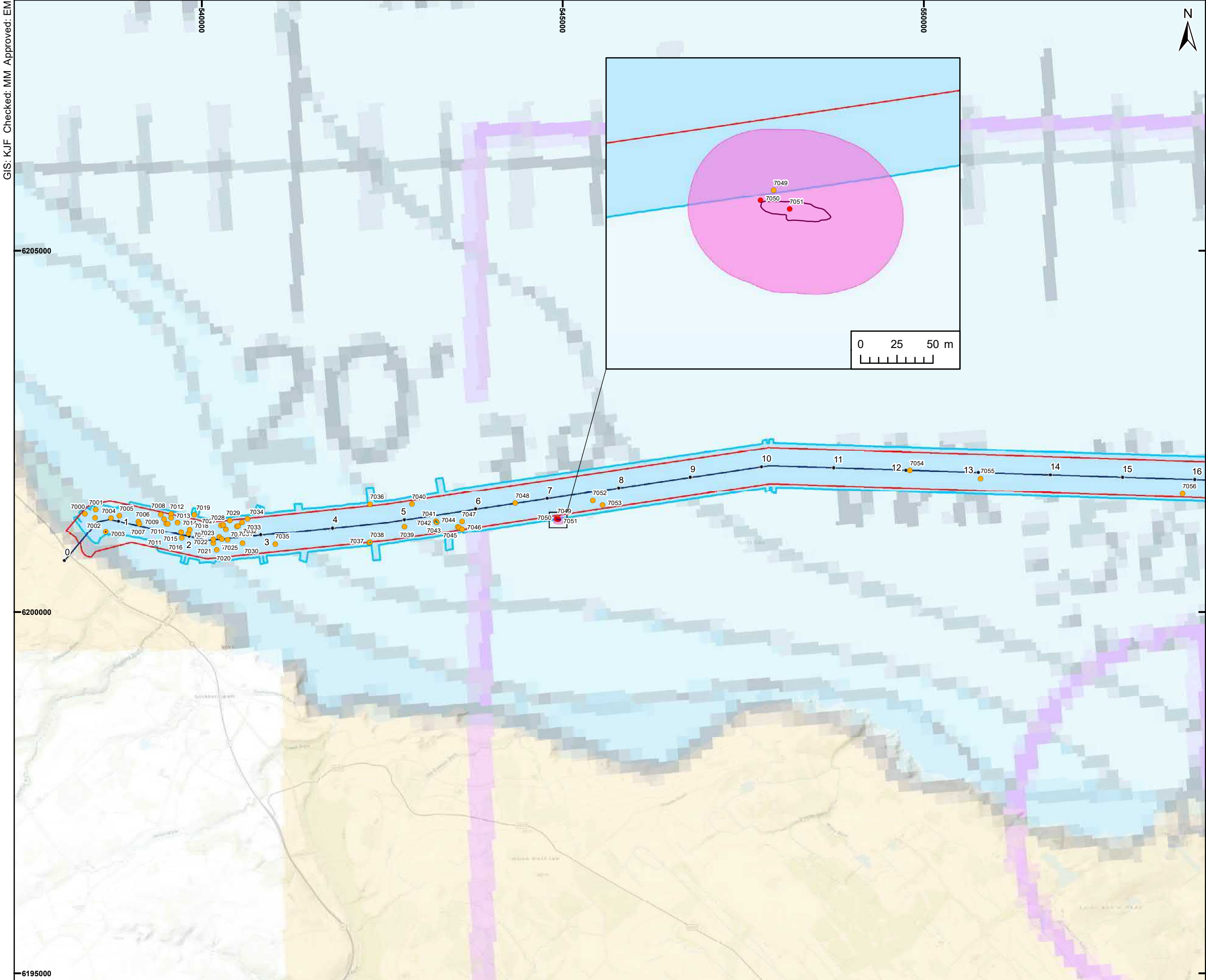
The section of the ASA within English Territorial Waters contains eight charted wrecks. Four of these wrecks (**2005**, **2006**, **2012** and **2018**) consist of steamships wrecked between 1881 and 1940. The Norwegian cargo steamship *Gudveig* (**2005**) and English cargo steamship *Norman* (**2018**) are marked as dead by the UKHO, i.e. they have not been detected by repeated surveys and therefore they are considered not to exist.

Record **2008** is that of an unknown wreck. The remaining three wrecks (**2009**, **2013** and **2015**) consist of fishing vessels which wrecked between 1983 and 2004. The wreck of *Lagan Lomea* (**2009**) is marked as dead by the UKHO, i.e. they have not been detected by repeated surveys and therefore they are considered not to exist.

12.4.2.4 Geophysical Seabed Features Assessment

The results of this assessment are collated in gazetteer format detailed in Appendix D, and illustrated in Figure 12.1-6a-k and Figure 12.1.7.

GIS: KJF Checked: MM Approved: EM



PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features
 - Seabed feature extents
 - Recommended archaeological exclusion zones

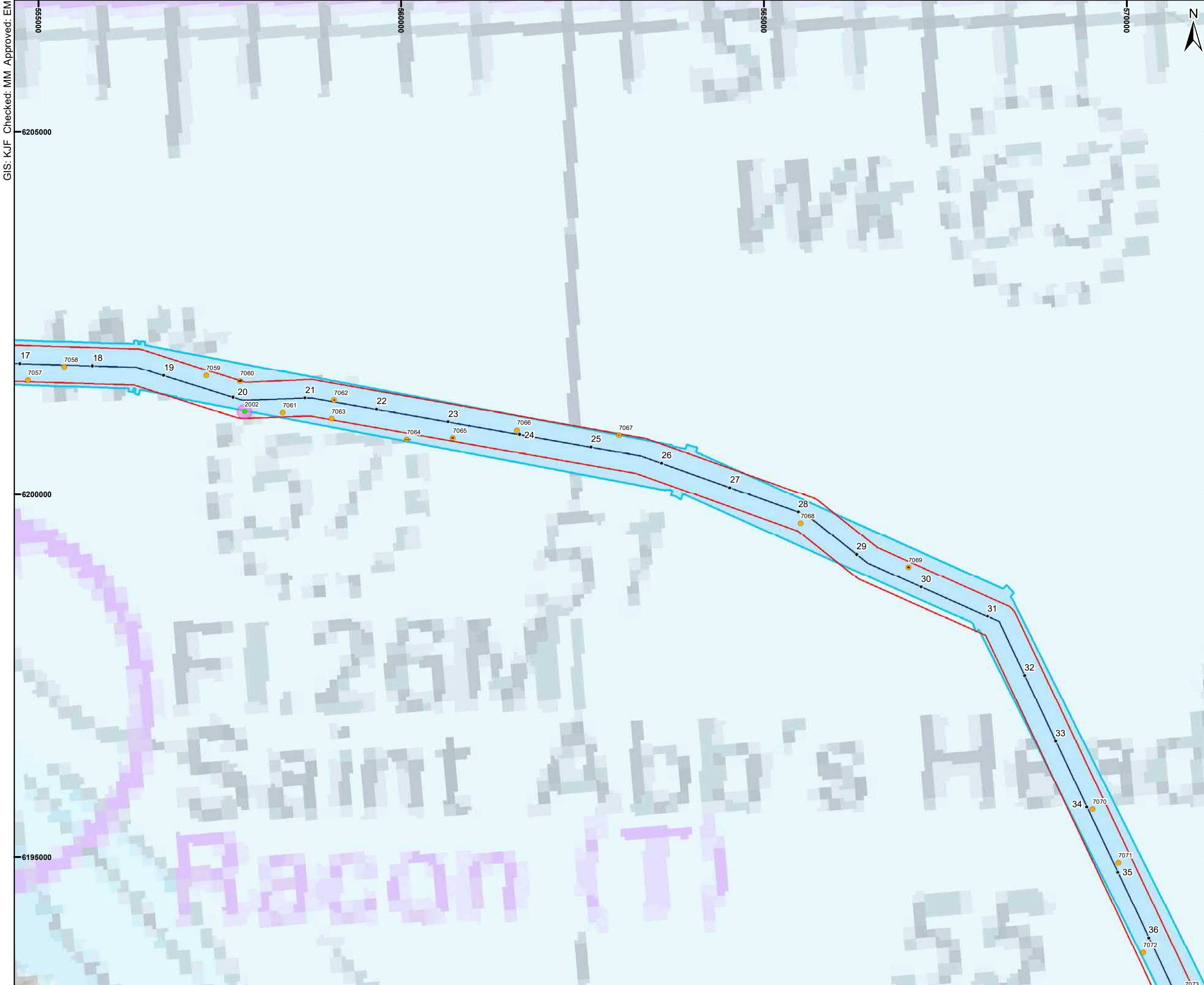


TITLE
**Figure 12.1-6a
Seabed features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Scottish/English Water Border
 - Geophysical Study Area
 - Recorded Wrecks
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features
 - Seabed feature extents
 - Recommended archaeological exclusion zones

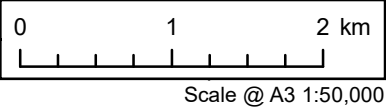


TITLE
**Figure 12.1-6b
Seabed features of
archaeological potential**

REFERENCE
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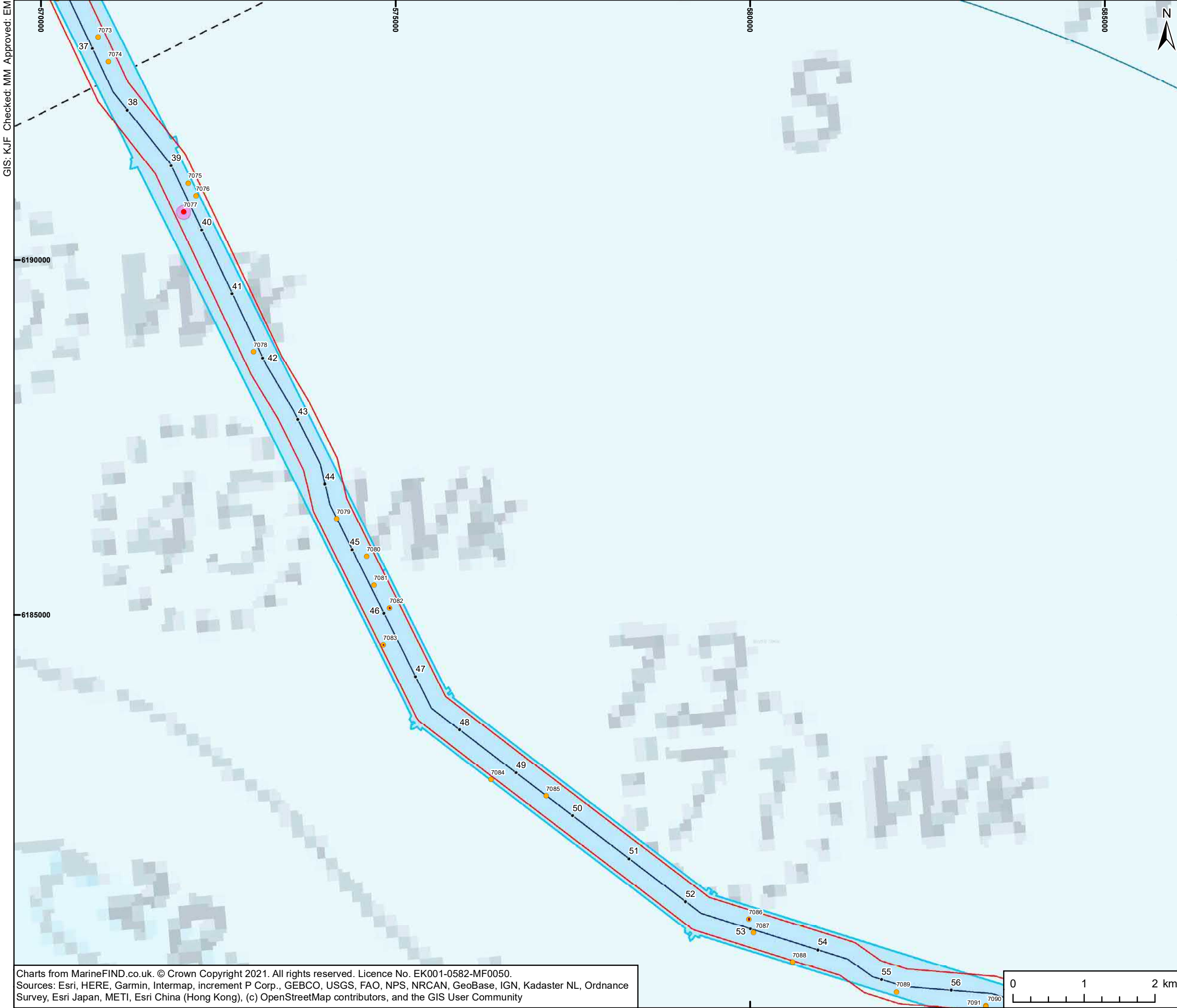
SHEET NUMBER
1 of 11

DATE
27/04/2022



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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

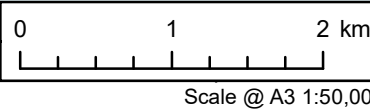
- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Scottish/English Water Border
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Seabed feature extents
 - Recommended archaeological exclusion zones



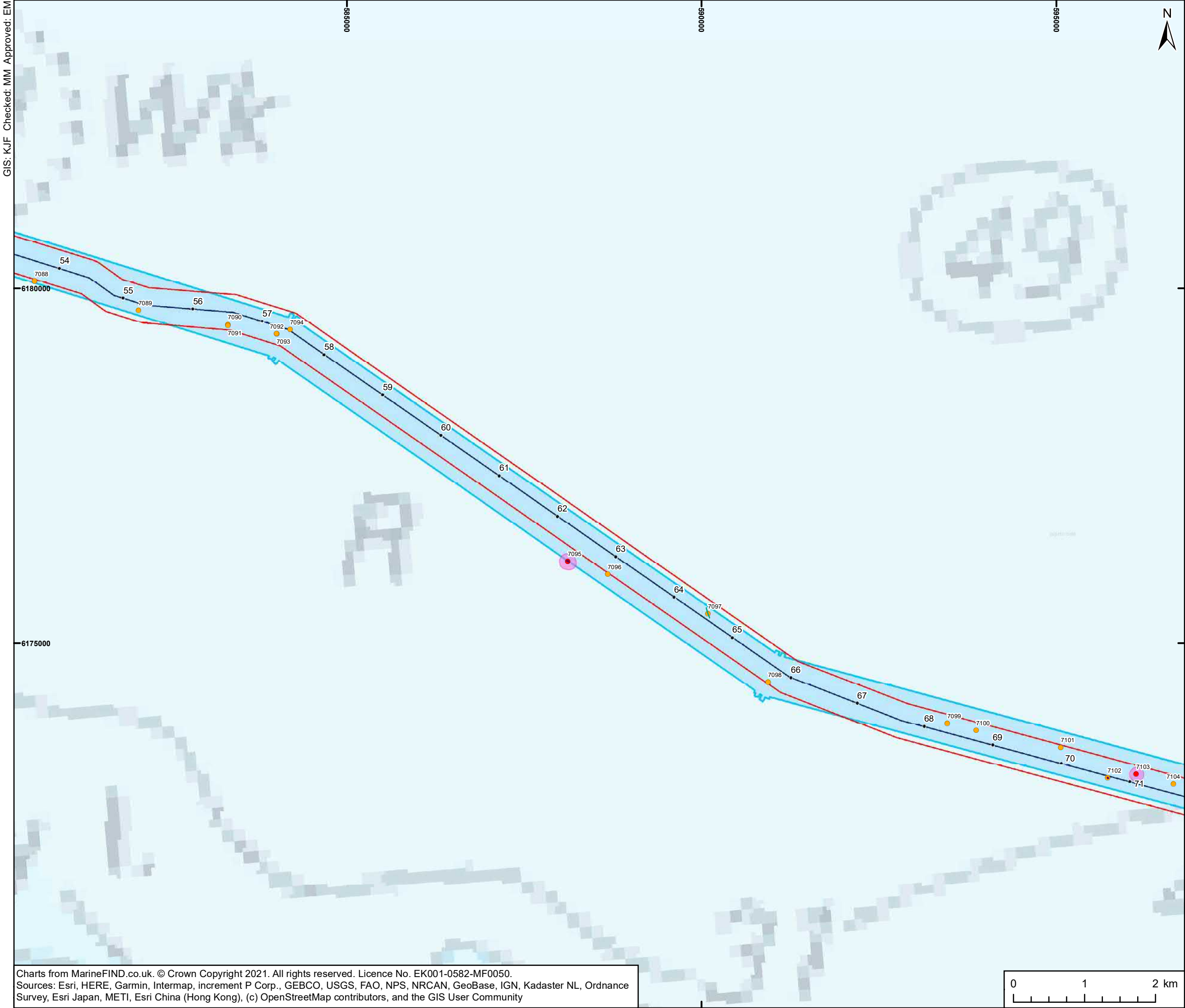
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Seabed features of
archaeological potential**

REFERENCE
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features
 - Seabed feature extents
 - Recommended archaeological exclusion zones



TITLE
**Figure 12.1-6d
Seabed features of
archaeological potential**

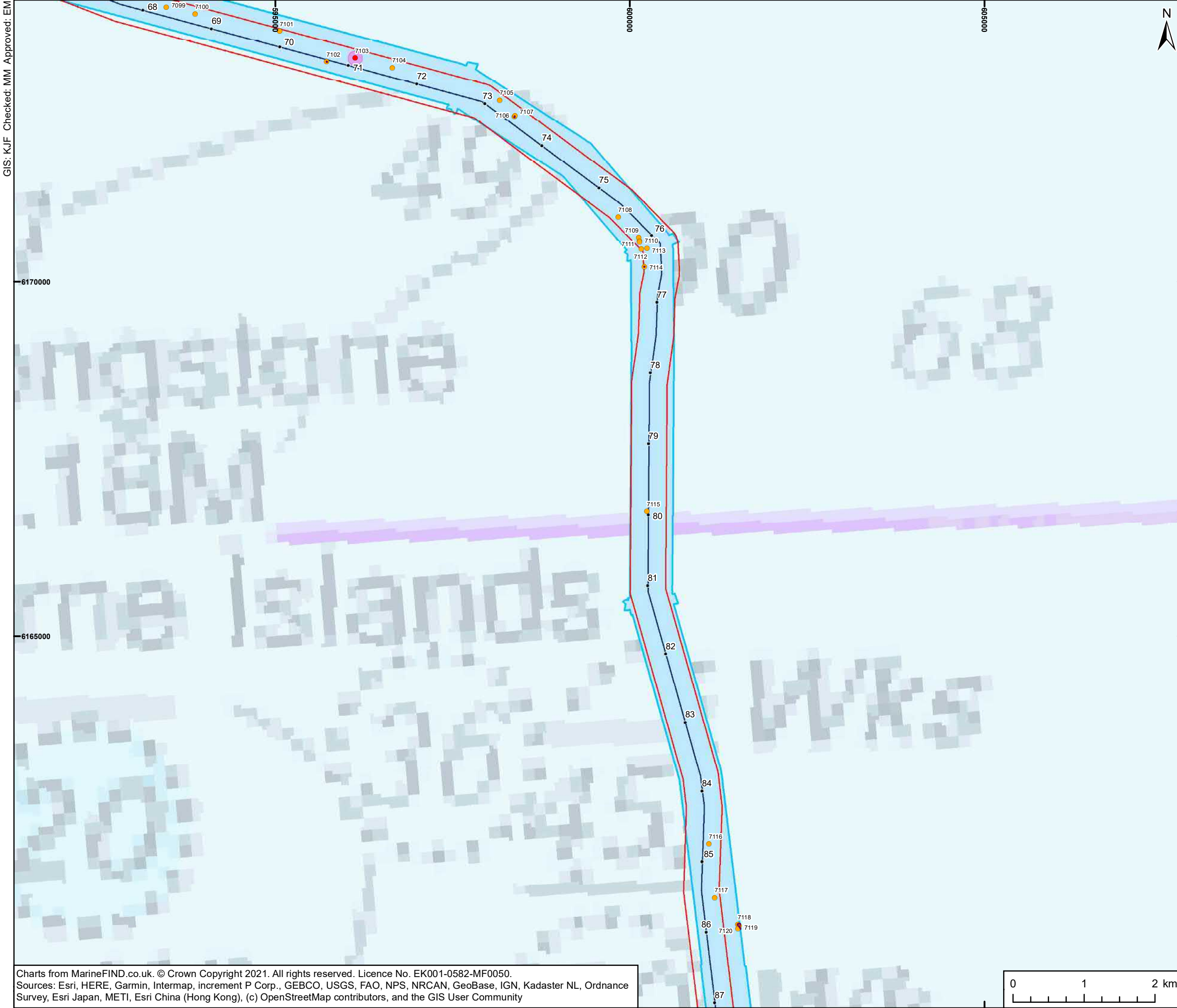
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DATE
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Seabed feature extents
 - Recommended archaeological exclusion zones



TITLE
**Figure 12.1-6e
Seabed features of
archaeological potential**

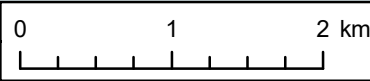
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4 of 11

DATE
27/04/2022

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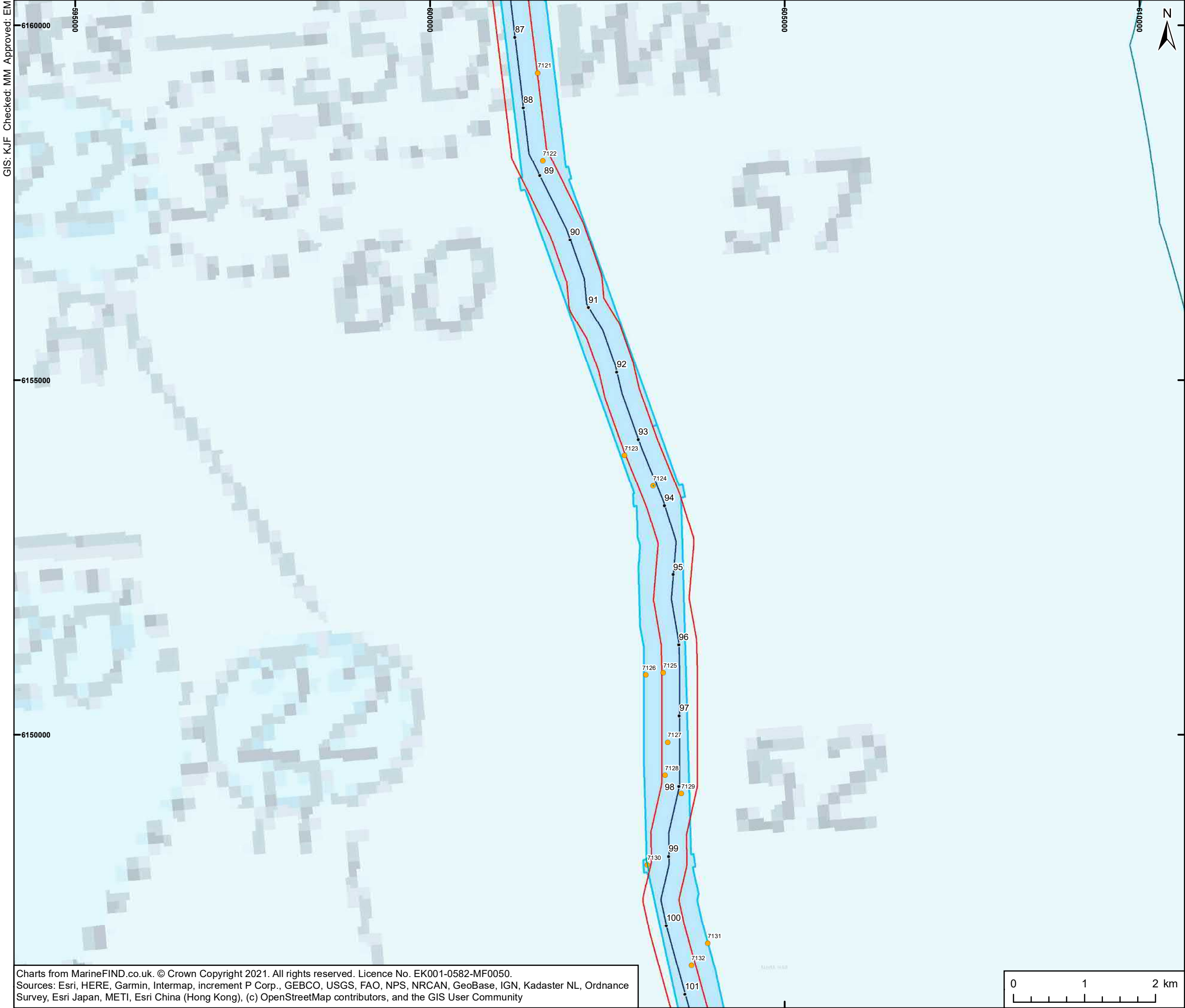
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Scale @ A3 1:50,000

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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features



TITLE
**Figure 12.1-6f
Seabed features of
archaeological potential**

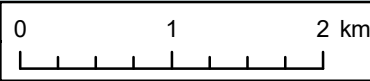
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SHEET NUMBER
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DATE
27/04/2022

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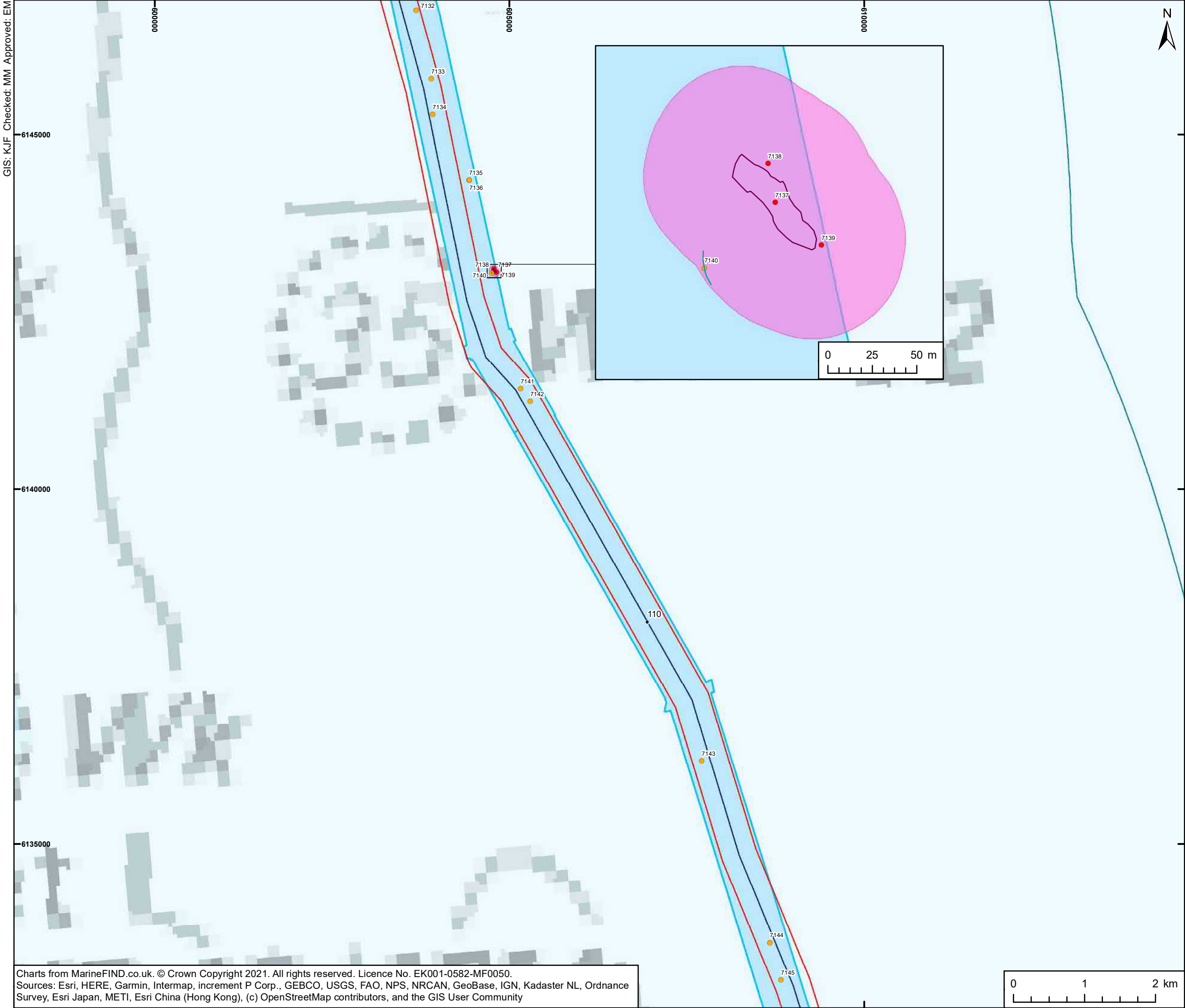
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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features
 - Seabed feature extents
 - Recommended archaeological exclusion zones



TITLE
**Figure 12.1-6g
Seabed features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
7 of 11

DATE
27/04/2022

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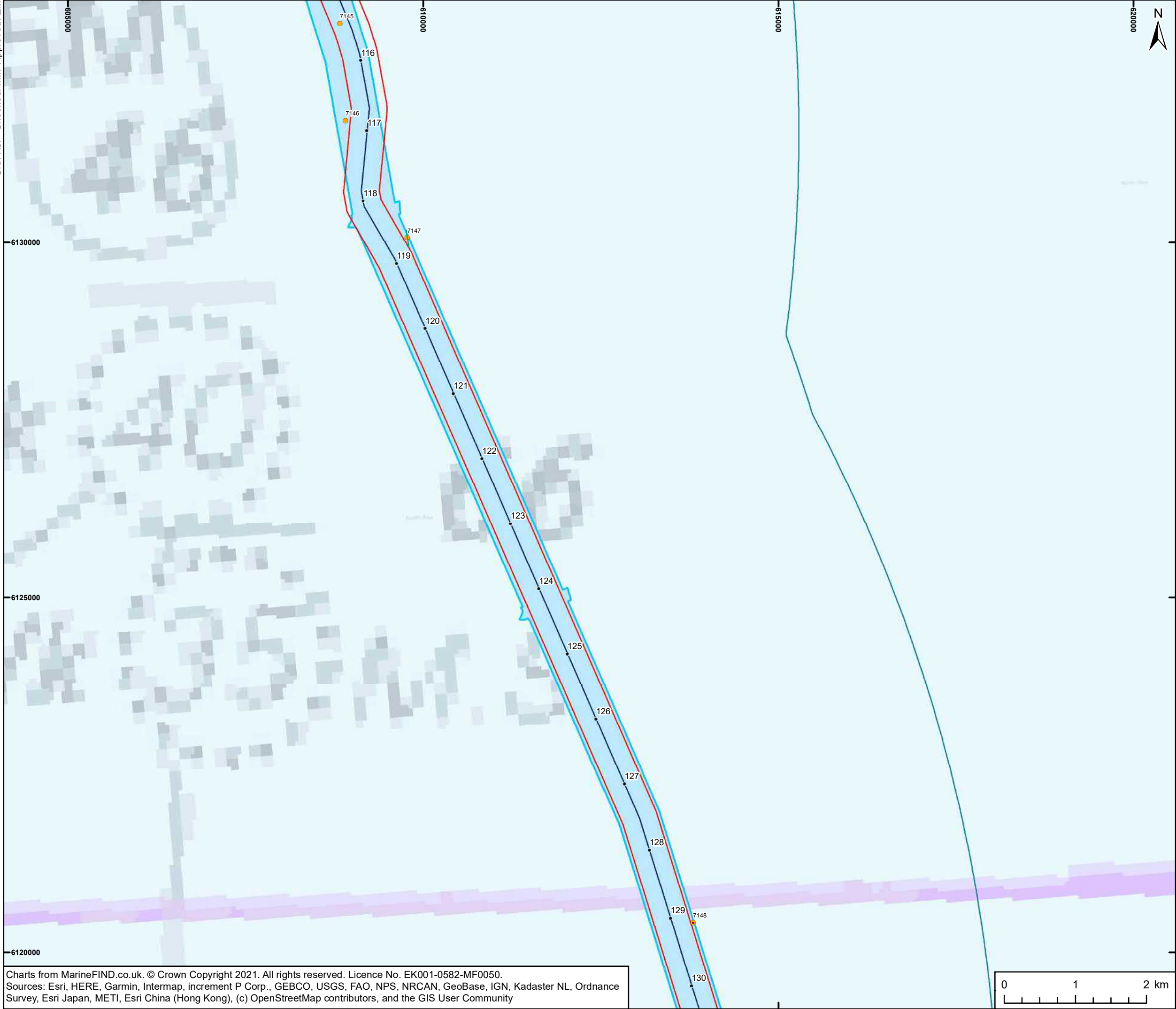
Coordinate System: ETRS89 UTM30N

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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features
 - Seabed feature extents



TITLE
**Figure 12.1-6h
Seabed features of
archaeological potential**

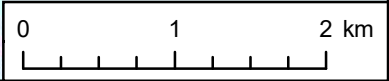
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SHEET NUMBER
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DATE
27/04/2022

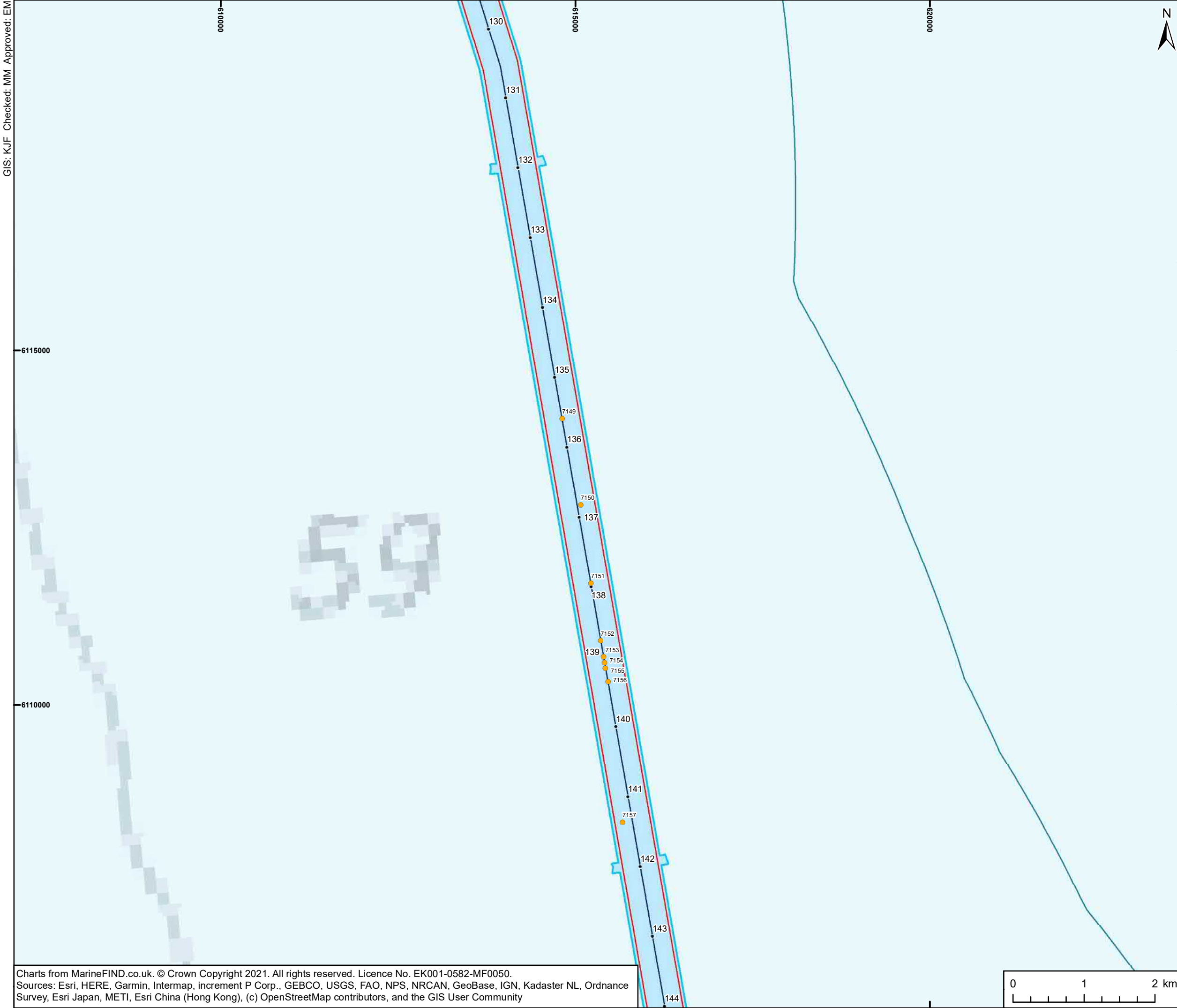
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - A2 – Uncertain origin of possible archaeological interest



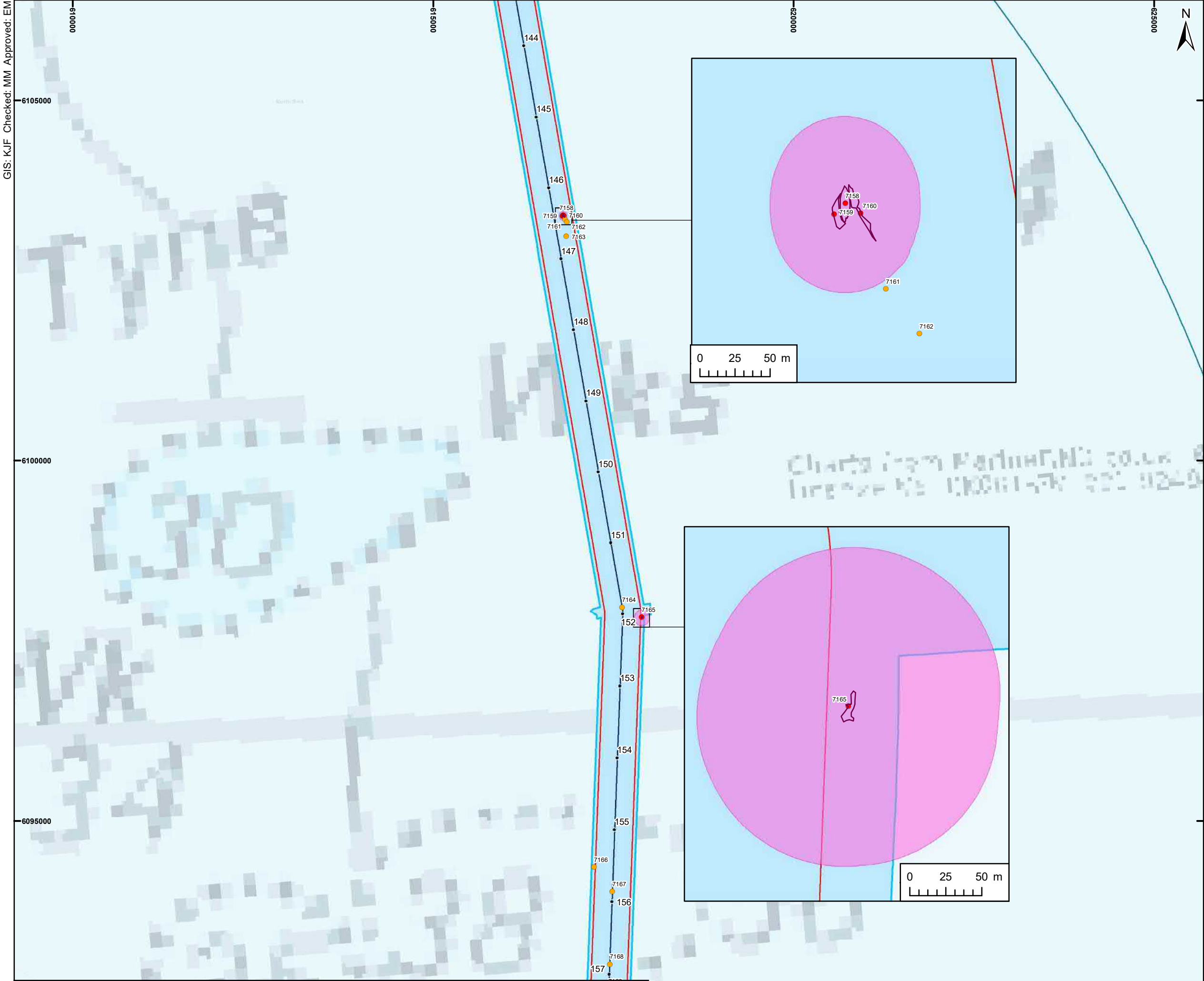
TITLE
**Figure 12.1-6i
Seabed features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220427

SHEET NUMBER
8 of 11

DATE
27/04/2022

GIS: KJF Checked: MM Approved: EM



PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - UK Territorial Sea Limit
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Seabed feature extents
 - Recommended archaeological exclusion zones



TITLE
**Figure 12.1-6j
Seabed features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220428

SHEET NUMBER 10 of 11
DATE 28/04/2022

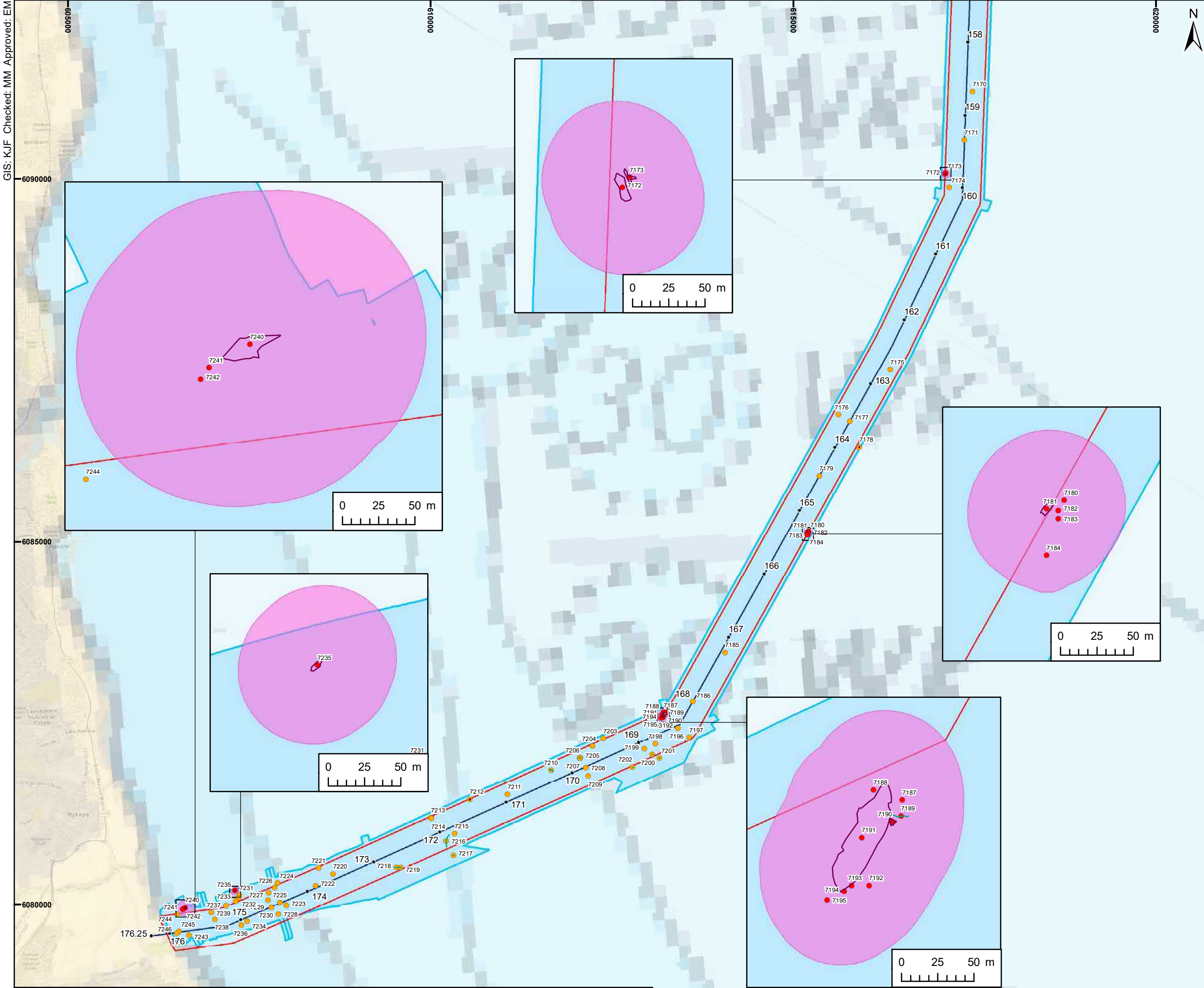
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Coordinate System: ETRS89 UTM30N

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Scale @ A3 1:50,000

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PROJECT
**Scotland England Green Link 1/
Eastern Link 1**

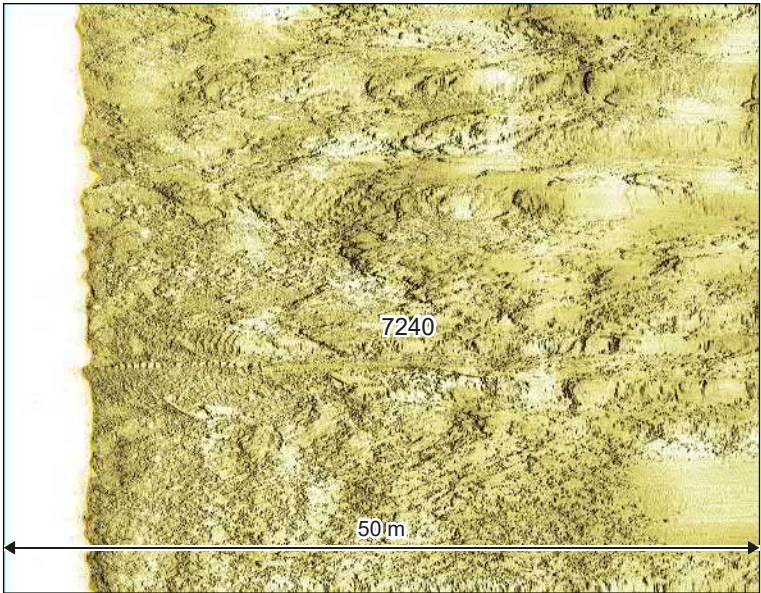
- KEY
- Marine Installation Corridor
 - Cable Route
 - Kilometre Point (KP)
 - Geophysical Study Area
 - A1 – Anthropogenic origin of archaeological interest
 - A2 – Uncertain origin of possible archaeological interest
 - Linear seabed features
 - Seabed feature extents
 - Recommended archaeological exclusion zones



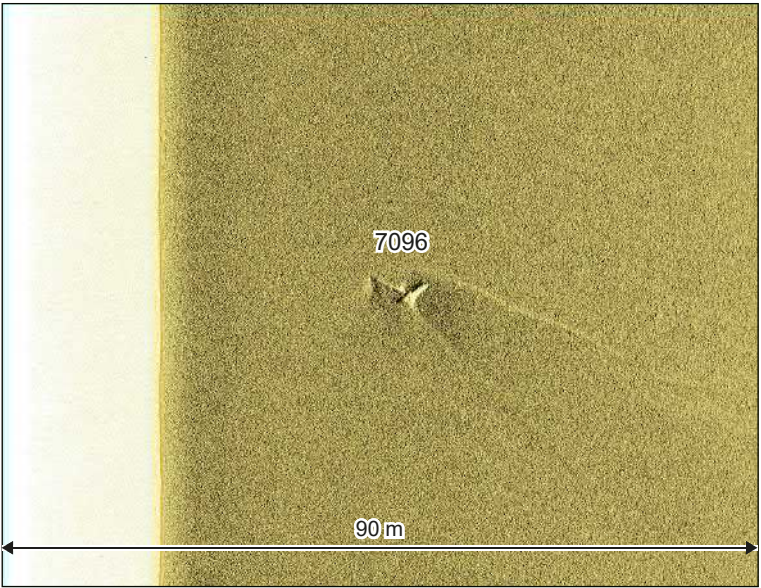
TITLE
**Figure 12.1-6k
Seabed features of
archaeological potential**

REFERENCE
SEGL1_M_SR_1_v1_20220428

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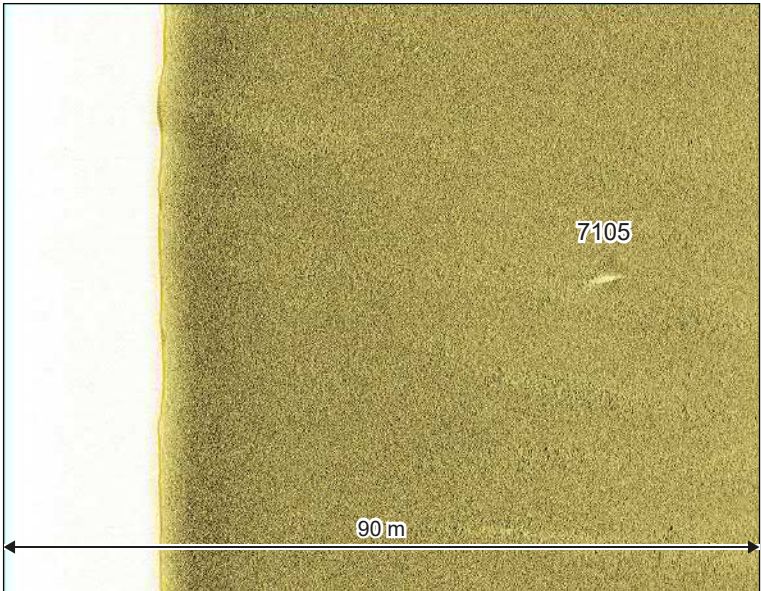
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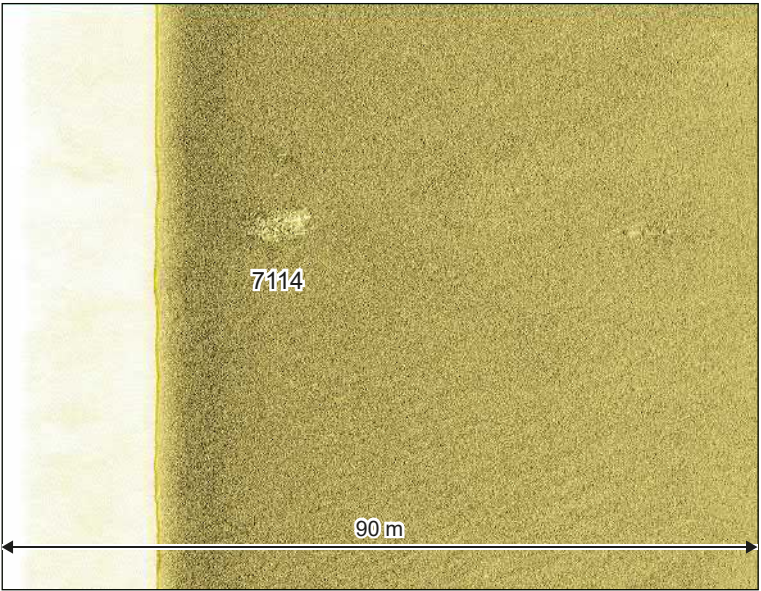
Sidescan sonar image of debris **7096**, measuring 7.3 x 6.2 x 0.6 m



Multibeam bathymetry image of debris **7096**, looking north, x1 vertical exaggeration



Sidescan sonar image of bright reflector **7105**, measuring 5.0 x 2.2 m



Sidescan sonar image of seabed disturbance **7114**, measuring 14.8 x 14.2 x 0.9 m



Sidescan sonar image of rope/chain **7140**, measuring 20.7 x 0.3 x 0.1 m

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The geophysical data were appraised to identify features of archaeological potential relating to maritime and aviation activity. Any sites located outside of the defined geophysical study area, either previously recorded in known databases (e.g. UKHO) or identified during this geophysical appraisal, are deemed beyond the scope of the current project and are subsequently not included in this report.

A total of 247 features have been identified as being of possible archaeological potential within the geophysical study area and are discriminated as shown in Table 12-8. Where features have been identified outside of the geophysical study area, they have not been included or reported in this section.

Table 12-8: Anomalies of archaeological potential within the study area

Archaeological Discrimination	Quantity	Interpretation
A1	32	Anthropogenic origin of archaeological interest
A2	215	Uncertain origin of possible archaeological interest
Total	247	

Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance (Table 12-9).

Table 12-9: Types of anomaly identified

Archaeological Classification	Definition	Number of anomalies
Wreck	Areas of coherent structure including wrecks of ships, submarines and some aircraft (where coherent structure survives)	8
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	9
Debris	Distinct objects on the seabed, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin	29
Seabed disturbance	An area of disturbance without individual, distinct objects. Potentially indicates wreck debris or other anthropogenic features buried just below the seabed.	14
Rope/chain	Curvilinear dark reflectors, often with a small amount of height, indicating rope or chain (if ferrous)	20
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	3
Dark reflector	Individual objects or areas of high reflectivity, displaying some anthropogenic characteristics. Precise nature is uncertain	64
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris.	9
Magnetic	No associated seabed surface expression, and have the potential to represent possible buried ferrous debris or buried wreck sites	91
Total		247

A total of 32 anomalies have been discriminated as A1 during this appraisal.

A1 Anomalies - Scotland

Wreck **7051** (KP 7) was identified in the SSS dataset as a cluster of irregular and rounded dark reflectors, possibly representing internal structures, within a thin, elliptical outline or edge with varying height, which is interpreted as the hull outline (**Wreck Sheet 1**). The wreck is located within a boulder field, making identification of surrounding debris objects difficult. This feature was not directly covered by the Mag. dataset, and so it is not possible to ascertain whether ferrous material is present at this location. The feature was also outside of the MBES data coverage. The wreck coincides with UKHO 95243, which is that of an unknown vessel which was first located in 2020, with recorded dimensions of 48 x 9 m at a general depth of 38.5 m.

A small possible item of debris, identified in the SSS data as an irregular, elongate dark reflector measuring 3.9 x 1.5 x 0.3 m (**7050** (KP7)) is identified adjacent to the wreck and has been interpreted as an associated item of debris. It should be noted that both wreck 7051 and associated debris 7050 are identified outside of the client-supplied SSS mosaic extents which is being used as the geophysical study area; however, it was identified at the outer limits of the client-supplied SSS data. As features of potential archaeological significance, they have been retained and reported on here as any associated recommended AEZ would likely impact the study area.

A1 Anomalies - England

Feature **7095** (KP 62) is a debris field comprising parallel linear features and containing multiple angular dark reflectors with height (**Wreck Sheet 2**). The debris field was seen in the SSS data to measure 45.4 x 17.3 x 1.1 m; however, it should be noted that the feature was only partially covered by the SSS data and, as such, these dimensions should be considered a minimum. Furthermore, it should be noted that the central position of **7095**, as provided in Appendix D, is unlikely to represent that actual centre point of the feature; however, without further investigation and full geophysical coverage of the feature, this cannot be confirmed. The debris field was not covered by the MBES data or the Mag. data and, as such, it is not possible to confirm the presence of ferrous material at the location.

The debris field is located approximately 18 m north-east of UKHO 4467, which is the location of the wreck of the steamship *Maystone* (possibly), which sank 18 October 1949 after a collision with an aircraft carrier. It is likely that debris field **7095** either represents a section of the wreck, or associated wreck debris. However, as the feature has only been partially covered by the geophysical data, this cannot be confirmed and, as such, the feature has been classified as a debris field rather than a wreck. Debris field **7095** is identified outside of the client-supplied SSS mosaic extents which is being used as the geophysical study area; however, it was identified at the outer limits of the client-supplied SSS data. As a feature of potential archaeological significance, it has been retained and reported on here as any AEZ would likely impact the study area.

Wreck **7137** (KP 104) was identified in the SSS data as a relatively broken up, possibly upright wreck with a distinct outline and a spread of linear dark reflectors with shadows within the wreck boundary (**Wreck Sheet 3**). The wreck measures 62.1 x 26.3 x 1.1 m and has a jagged shadow suggesting it has varying height. The wreck was not covered by the MBES or Mag. data and, as such, it is not possible to confirm the presence of ferrous material at the location, although the associated UKHO record notes that the vessel is composed of steel and therefore it is expected to be ferrous in construction. Wreck **7137** corresponds with the UKHO position for the *Morlaix* (UKHO 4367), a steamship built in 1911 which sank 6 May 1942 whilst passage to Sunderland from Macduff due to a collision.

Debris items **7138** (KP 104) and **7139** (KP 104) are identified in the vicinity of the wreck **7137** and are considered to be associated wreck debris. As such, these have also been discriminated as A1 anomalies.

Feature **7158** (KP146) was identified in the SSS data as a distinct, elliptical feature measuring 24.6 x 10.7 m, with some possible indistinct internal dark reflectors and a tall shadow across its extent showing heights of 2.5 m (**Wreck Sheet 4**). In the MBES data, the feature is identified as an elongate mound, oriented north to south, with scour along its eastern and western edges. Very little internal structure is visible, but an irregular mound is discernible at its northern extent. The feature was not directly covered by the Mag. dataset, so it is not possible to ascertain whether the feature contains or comprises ferrous

material. There is no associated UKHO position at this location; however, based in its size and form it has been interpreted as a possible wreck.

It should be noted that **7158** is located 392 m south-west of a UKHO record for a dead wreck (UKHO 4547), which is situated outside of the geophysical data coverage. It is possible that **7158** represents that wreck; however, based on the UKHO description, the dimensions for the recorded wreck are smaller than those of the feature identified here and, as such, this is considered as unlikely.

Features **7159** (KP 146) and **7160** (KP 146) are possible debris fields associated with wreck **7158**. Debris field **7159** was identified as an area of disturbed seabed along the western edge of wreck **7158**, measuring 25.6 x 12.6 and comprising small, indistinct dark reflectors. In the MBES data, the feature was identified as very small, angular mounds within scour. It is possible that this disturbance may be related to debris items associated with **7158**.

Debris field **7160** was identified in the SSS data as an elongate, irregularly shaped area of dark reflectors measuring 48.4 x 20.1 x 1.4 m, comprising a long, curvilinear dark reflector with slight shadow that may be a rope or chain, surrounded by smaller dark reflectors. The feature is seen to extend out from the eastern edge of the wreck and is interpreted as associated wreck debris.

Wreck **7165** (KP 152) was identified in the SSS data as an elongate, slightly dispersed area of dark reflectors of varying size measuring 19.6 x 5.7 m, with bright, irregular shadows, possibly indicating uneven heights of up to 4 m (**Wreck Sheet 5**). The feature was not covered by the MBES or Mag. data and, as such, it is not possible to confirm the presence of ferrous material at the location. Wreck **7165** corresponds with the UKHO position fishing vessel *Eventide* (UKHO 4248), a wooden hulled vessel which sank 19 June 1976 after taking on water. Based on the vessel's sinking date, it is possible that it is too modern to be of archaeological interest. However, without further information on the vessel's build date, it has been retained as of potential archaeological interest as a precaution.

Wreck **7172** (KP 160) was identified in the SSS dataset as a distinct, elongate feature measuring 19.8 x 5.9 x 1.6 m, with a large, bright shadow (**Wreck Sheet 6**). The object appears to be intact with internal structure visible as two rectangular sunken features. In the MBES data the feature was identified as a distinct mound, oriented north north-west to south south-east, with some possible scour along its eastern edge. The feature was not directly covered by the Mag. dataset, so it is not possible to ascertain whether the feature contains or comprises ferrous material.

The feature corresponds with UKHO 5729, which is the position of an unknown wreck, recorded as having an angular structure with possible lattice construction. It should be noted that the UKHO record states that a later survey in 1988 suggested that it may not be a wreck but instead an item of lost deck cargo or a prefabricated section of an offshore installation. It is therefore possible that this feature represents a modern debris item and is therefore of no archaeological interest. However, based on its form in the geophysical data, and the fact the feature has not been ground-truthed by divers or remotely operated vehicle, it has been retained as a possible wreck as a precaution.

Debris field **7173** (KP 160) was identified in the SSS data as an area of disturbed seabed measuring 10.9 x 2.5 m, visible as an irregular area of dark reflectors within a slight depression. The feature is situated on the eastern edge of **7172**. Based on its proximity to **7172**, it is considered to likely be an area containing associated debris. However, as with **7172**, it should be noted that these may be modern and therefore of no archaeological interest. Further investigation would be needed to determine the origin and age of these features.

Wreck **7181** (KP 165) was identified in the SSS data as a relatively, small, distinct, elongate dark reflector measuring 10.5 x 4.7 x 3.0 m, which appears to be the hull of a wreck (**Wreck Sheet 7**). The wreck has defined edges and a distinct, irregular shadow, possibly suggesting uneven height, with one particularly tall shadow indicating upstanding debris. In the MBES data, **7181** was identified as an elongate mound orientated north-east to south-west, with tall, irregular profiles and associated scour extending to the north-west. The feature was not directly covered by the Mag. dataset, so it is not possible to ascertain whether the feature contains or comprises ferrous material. The wreck corresponds with UKHO 5680, which is the location of an unknown wreck of unknown date, described as being intact, lying on its side with wheelhouse clearly visible.

Debris items **7180** and **7182 -7184** (KP 165) are all identified within the vicinity of wreck **7181** and are considered to likely be associated items of wreck debris. As such, these have also been discriminated as A1 anomalies.

Wreck **7191** (KP 168) was identified in the SSS data as a large, broken-up wreck, measuring 80.3 x 35.0 x 5.3 m, with a relatively defined outline lying upright on the seabed (**Wreck Sheet 8**). The wreck was seen to comprise numerous linear, sub-angular and irregular dark reflectors and objects with height, including one particularly tall object at one end and a possible slatted deck. In the MBES data, the wreck was identified as a wreck orientated north-east to south-west with some sediment build-up on the western side and apparent scour along the eastern edge. The wreck corresponds with a very large magnetic anomaly, measuring 1,678 nT, indicating ferrous content or construction.

Wreck **7191** is associated with UKHO 5672, which is the possible position for the wreck of the *Saga*, a Norwegian cargo vessel operating under the British Flag which was torpedoed by a German submarine in February 1918. It is listed by the UKHO as having dimensions of 75.8 x 20.2 x 6.3 m and as being well broken up but with clearly discernible features.

The wreck is surrounded by numerous associated objects including a possible length of rope or chain (**7189** (KP 168)), which measures 13.2 x 0.2 x 0.1 m; a debris field (**7190** (KP 168)) measuring 4.6 x 4.3 x 0.3 m; and several individual items of debris (**7187-7188** (KP 168) and **7192-7195** (KP 168 / 169)). These features are all considered to be likely associated with wreck **7191** and, as such, have also been discriminated as A1 anomalies. Wreck **7191** was identified within a wider area of boulders and, as such, there is potential for further debris to be located in the vicinity that has not been identified at this time.

Feature **7235** (KP 175) was identified in the SSS data as an elongate area of high reflectivity, measuring 12.1 x 5.8 m and with slight height, with a single distinct dark reflector with a height of 0.7 m at its centre (**Wreck Sheet 9**). The feature is outside of the MBES and Mag. data coverage, although the closest Mag. line was approximately 13 m to the south and no magnetic variation was identified, suggesting the feature is unlikely to contain a significant amount of ferrous material. Although the feature does not look distinctly like a wreck in the SSS data, the location corresponds with UKHO 89472, which is the position of a wreck lying on its side measuring 18.3 x 5.5 x 0.8 m and orientated 050/230 degrees, which was first identified in a 2018 MBES survey. Based on its form in the geophysical data, it is possible that this feature represents an area of natural geological outcropping which is of no archaeological interest; however, due to the associated UKHO record the feature has been retained as a feature of archaeological interest as a precaution.

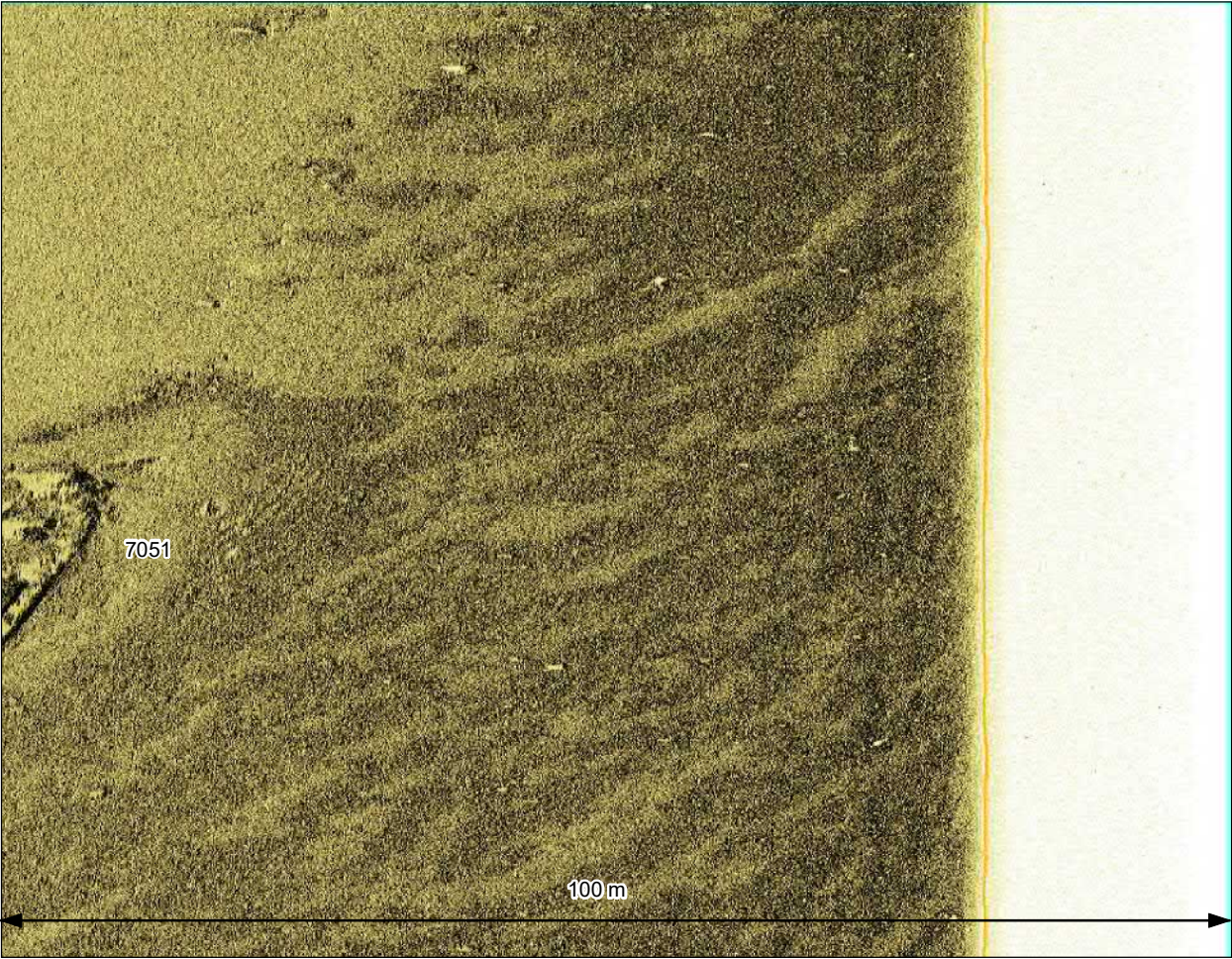
Debris field **7240** (KP 176) was identified in the SSS data as a large area, measuring 49.4 x 18.8 m, containing numerous dark reflectors with heights of 0.2 m. In the SSS data the debris field is seen to comprise linear dark reflectors, as well as some features that appear elongate and slatted in form (**Wreck Sheet 10**, Figure 12-1.7). Two individual items of debris (**7241** and **7242** (KP 176)) are both located nearby and considered likely associated with the debris field. All these features were identified within an area of underlying geology outcropping at seabed, which makes it difficult to identify the exact extents of the features. It is therefore possible that there may be other associated debris items in the vicinity which have not been identified. These features are located at the position of a very large magnetic anomaly, measuring 9,783 nT, indicating a significant amount of ferrous material is present.

The feature has no corresponding UKHO record, although is located approximately 350 m south-west of UKHO 57777, which is that of the steamship *Norman* which sank in 1881 after becoming stranded. The record states that during a 1999 investigation, the wreck was identified as a few pieces of scattered iron in an area of rocky ground with very little recognisable structure, with the exception of a battered boiler and a propeller which was protruding from sand and rock. This corresponds with the dispersed nature of **7240**, however the record further states that during a 2018 survey the feature was considered to be part of a rocky outcrop and the record was amended to being dead. **7240** is also close to an area of foul ground marked on the admiralty chart and may therefore be related to that; however, as this cannot be confirmed without further investigation, the feature has been retained as a feature of archaeological potential. May be a dispersed area of wreckage, possibly related to UKHO 57777, or modern items of debris.

Two magnetic anomalies (**7077** (KP 40) and **7103** (KP 71)) have been assigned an A1 archaeological discrimination based on their amplitudes. Magnetic anomaly **7077** was seen to have a magnetic

amplitude of 1,219 nT and **7103** had a magnetic amplitude of 1,007 nT. There is nothing anomalous visible on the SSS or MBES data at these positions and they have been interpreted as substantial ferrous debris which is either buried or has no surface expression. As the amplitudes are over 1,000 nT, they are considered of higher archaeological potential as they suggest the presence of a more significant amount of ferrous material.

Location		544938 E 6201279 N	Area	EL1 – Scottish Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 7051 is situated in the Scottish sector of the study area and corresponds with the position of a UKHO record (95243), the wreck of an unknown vessel.		
		The feature is visible in the SSS data as a cluster of irregular dark reflectors within a thin elliptical edge of varying height. It is considered that this could represent possible internal structure with some hull remaining. This feature measures 49.8 x 13.5 x 0.9 m and is located in an area of numerous boulders.		
		This location was not directly covered by the MBES dataset; nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location.		
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of Survival		Recorded by the UKHO as an unknown wreck in a general depth of 38.5 m. The record states that the wreck was first identified by an MBES survey undertaken in 2020, and is recorded as being 48 x 9 m, with no visible identifying features.		
		In the 2021 geophysical data, the wreck appears to have some remaining structure, yet covers a slightly larger area than previously recorded. This indicates some deterioration and potentially some structural collapse. The wreck is located in an area of seabed which appears to have low sediment movement, which suggests it is likely to remain exposed with a low possibility for burial.		



Sidescan sonar image looking WSW, at 100 m range, of 7051

Scotland England Green Link 1/
Eastern Link 1



TITLE

Sheet 1
ID 7051 – UKHO 9524 - Unknown

REFERENCE

SEGL1_M_SR_1_v1_20220428

SHEET NUMBER

1 of 10

DATE

28/04/2022

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Location		588115 E 6176150 N	Area	EL1 – English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Debris field 7095 is situated in the English sector of the study area and likely corresponds with UKHO record 4467, thought to be the wreck of the <i>Maystone</i> (possibly).		
		This feature has only been partially covered by the SSS data and so does not represent the true extents of the feature. It is visible as an area of debris comprising large, parallel linear dark reflectors as well as multiple small irregular dark reflectors. The visible extents of this debris field are 45.4 x 17.3 x 1.1 m and it is located in an area of sand ripples.		
		This location was not directly covered by the MBES dataset, nor was it covered by the Mag. dataset. As such, it is not possible to ascertain whether ferrous material is present at this location.		
Build	Type	'Icemaid' class Empire collier steamship		
	Construction	Steel		
	Dimensions (m)	82.9 x 12.2 x 5.2		
	Shipyard	Grangemouth Dockyard		
Loss	Cause	Collision with HMS <i>Albion</i>		
Extent of Survival		This wreck is recorded in the following databases (with record number following) as possibly the <i>Maystone</i> : UKHO 4467, NHRE 1525637, and CANMORE 322965. This collier was built in 1945 by Grangemouth Dockyard with two boilers and a triple expansion engine. It was built by the Ministry of War Transport as the <i>Empire Wapping</i> , and sold in 1947 to the Thomas Stone Shipping Company and re-named the <i>Maystone</i> . It sank on the 18 th October 1949 after collision with the HMS <i>Albion</i> during a gale on passage to London.		
		This wreck was last surveyed in 2002 by Gardline and was reported to be largely intact and lying on its side on an approximate north to south alignment with some debris adjacent to the hull. It was reported to have a moderate magnetic response and to be lying in a general depth of 84 m.		
		In the 2021 geophysical data, no clear structure can be observed. Due to the fact the feature is only partially covered by the data, it is not clear if it represents part of the wreck itself or an associated debris field. The wreck is located in an area of sand ripples indicating mobile sediments, which suggests burial over some areas of the wreck may be possible. As the wreck was only partially covered by the geophysical data, the dimensions listed above should be considered a minimum.		

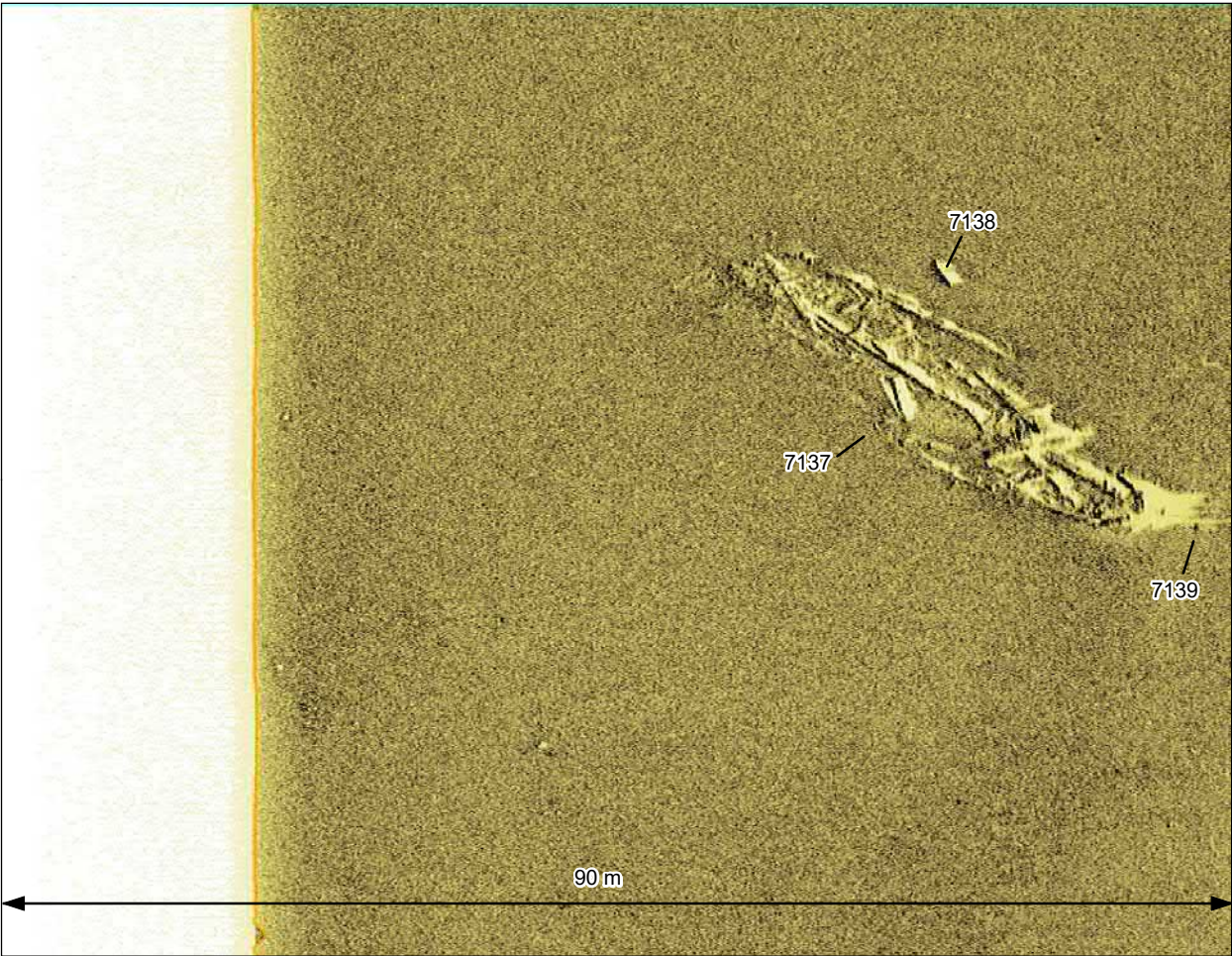


Sidescan sonar image looking north-west, at 90 m range, of 7095



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Location		604787 E 6143081 N	Area	EL1 - English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 7137 is a broken-up wreck situated in the English sector of the study area, orientated north-west to south-east. The wreck corresponds with UKHO record 4367, the <i>Morlaix</i> (Probably). The wreck is also recorded in the National Record of the Historic Environment and Canmore (NRHE 1381985, CANMORE 322866).		
		In the SSS data the wreck is visible as a large and distinct group of dark reflectors with bright shadows, comprising thick linear objects, and smaller angular and straight objects within the wreck boundary. The wreck appears well broken-up with no immediately recognisable upstanding internal structures, but still confined within a clear boundary. A larger uneven shadow is visible at its southern edge, suggesting increased, uneven height above seabed. The wreck area measures approximately 62.1 x 26.3 x 1.1 m.		
		This location was not directly covered by either the MBES or Mag. datasets so it is not possible to ascertain whether ferrous material is present at this location, although the UKHO record indicates the vessel was potentially steel hulled.		
		The wreck is situated on a relatively featureless area of seabed, with two possible items of associated debris identified in the vicinity.		
Build	Type	Steam ship		
	Construction	Steel hull		
	Dimensions (m)	419 tonnes (gross)		
	Shipyard	Unknown		
Loss	Cause	Collision		
Extent of Survival		Recorded by UKHO as the wreck of the <i>Morlaix</i> (Probably) (4367), a steel steamship built in 1911. The wreck was reported to have sank following a collision while on passage to Sunderland from Macduff carrying ballast in 1942.		
		The wreck was first identified during a survey in 1958. The most recent survey in 1999 reported the wreck as being well broken up, with upright superstructure visible and a poor associated magnetic anomaly, with measurements of 61.0 x 17.0 x 2.0 m recorded.		
		In the 2021 geophysical data the wreck appears to be highly broken up, with remnants of the hull visible. The smaller objects within and surrounding the hull suggest significant parts of the wreck have collapsed and objects in the vicinity of the wreck are interpreted to be associated debris. The location of the wreck within relatively featureless seabed suggests it is likely to always be exposed, with low possibility for burial.		



Sidescan sonar image looking NNW, at 90m range, of 7137

Scotland England Green Link 1/
Eastern Link 1



TITLE

Sheet 3
ID 7137 – UKHO 4367 – *Morlaix* (Probably)

REFERENCE

SEGL1_M_SR_1_v1_20220428

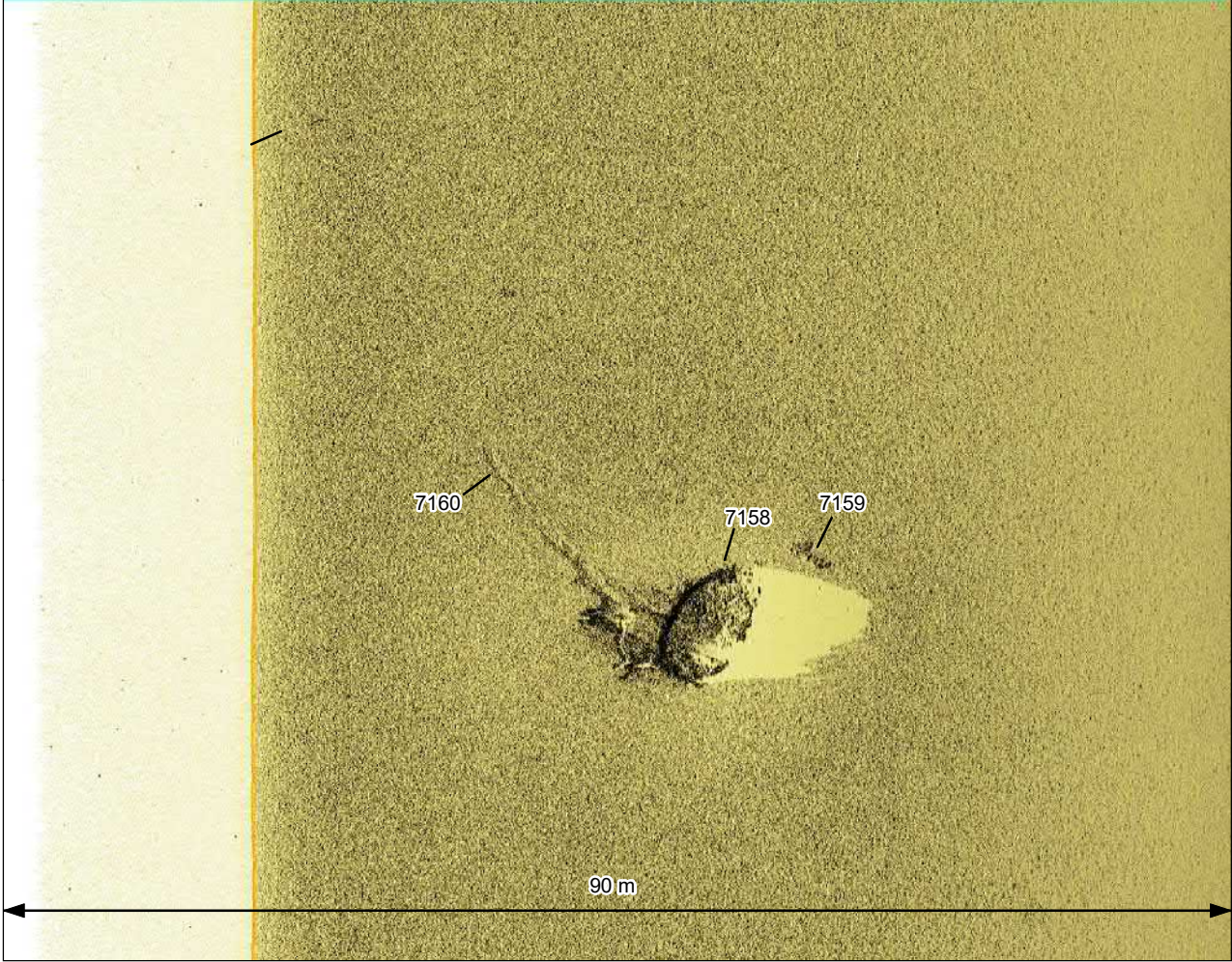
SHEET NUMBER

3 of 10

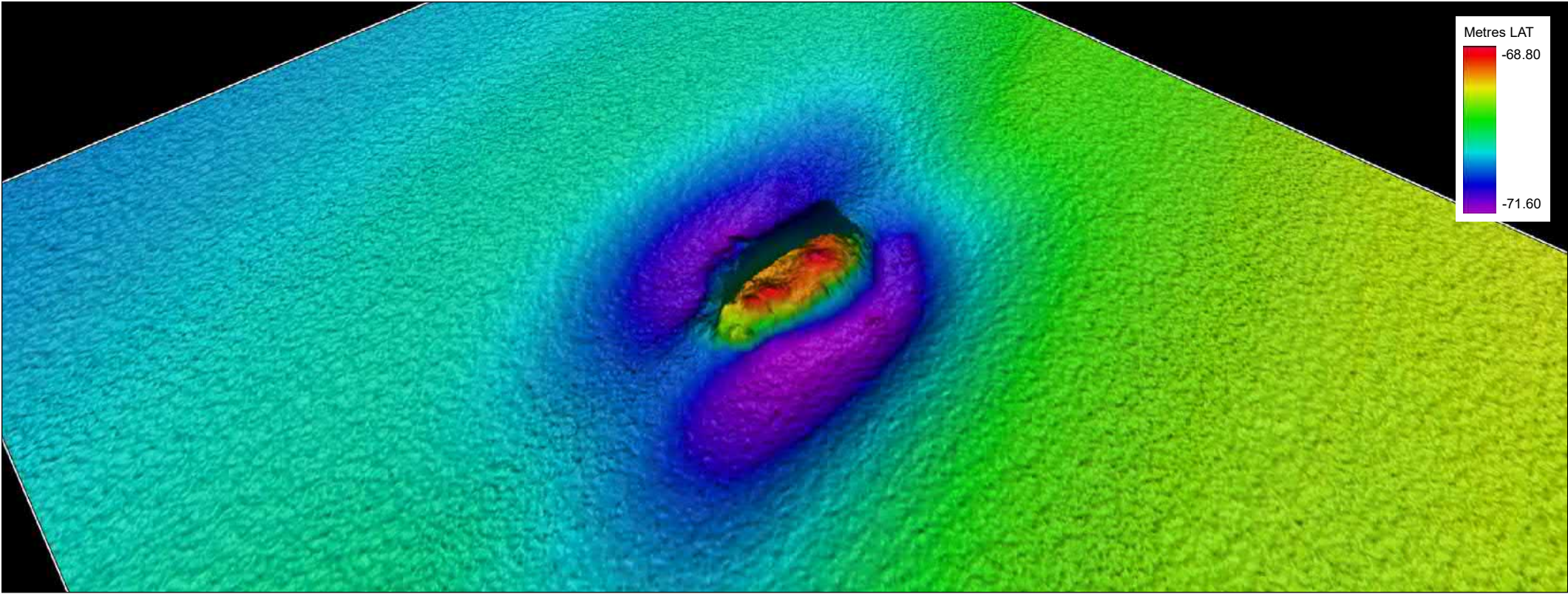
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28/04/2022

Location		616801 E 6103403 N	Area	EL1 - English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 7158 is an intact wreck situated in the English sector of the study area. The wreck is oriented approximately SSW-NNE, and is visible in the SSS dataset as an elliptical, distinct dark reflector, with some possible indistinct internal dark reflectors and a large shadow across its extent. The wreck has an associated debris field on its eastern edge, which comprises a long curvilinear dark reflector, interpreted to be a possible rope or chain, and a seabed disturbance on its western edge. The wreck area measures approximately 24.6 x 10.7 x 2.5 m.		
		The wreck is visible in the MBES dataset as a distinct, oval-shaped mound, on a relatively featureless area of seabed. Very little internal structure or detail is visible, but an irregular mound is discernible in the northern extent of the wreck. The feature has associated scour approximately 60.0 x 20.0 m and -1.0 m deep along its eastern and western edges.		
		This location was not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location.		
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of Survival		Wreck 7158 is an unrecorded wreck and therefore no comment can be made to its previous condition. Although the wreck has no definite corresponding UKHO record, it is situated approximately 390 m south-west of a dead recorded wreck UKHO 4547, which is situated outside of the geophysical survey coverage. UKHO 4547 refers to the wreck of a fishing vessel, <i>Lagan Lomea</i> , which is recorded as being less than 10 m in length. At 24.6 m long, wreck 7158 is unlikely to be associated with UKHO record 4547.		
		The wreck appears to be fairly intact from the 2021 MBES data and the associated scour indicates it is situated within an area of mobile sediments, which may partially bury the wreck or associated debris periodically. The surrounding debris field suggest elements of the wreck have collapsed and the seabed disturbance may indicate further buried and/or low-lying debris.		



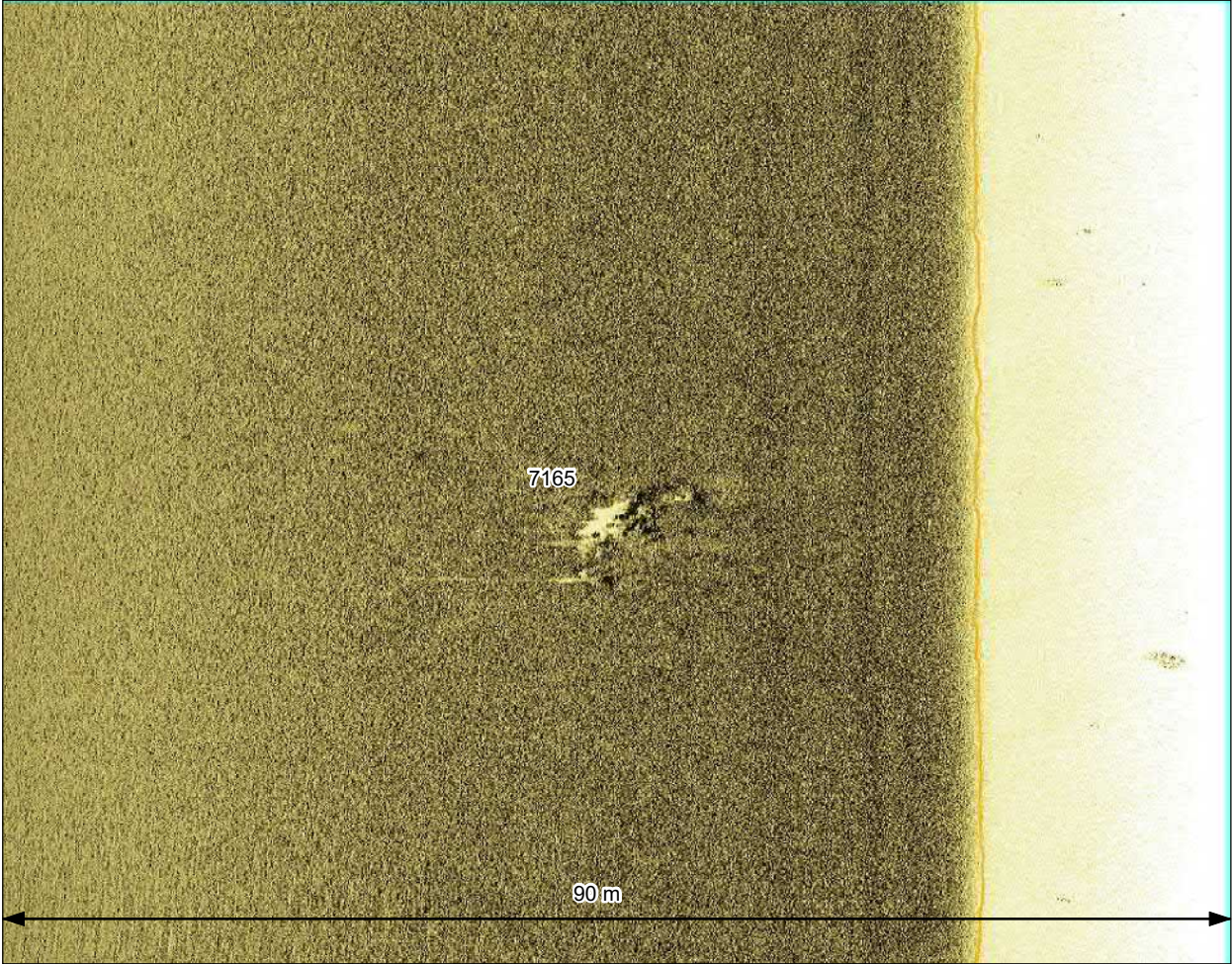
Sidescan sonar image looking south-south-east, at 90 m range, of 7158, 7159 and 7160



MBES grid image, x1 vertical exaggeration, looking south-east



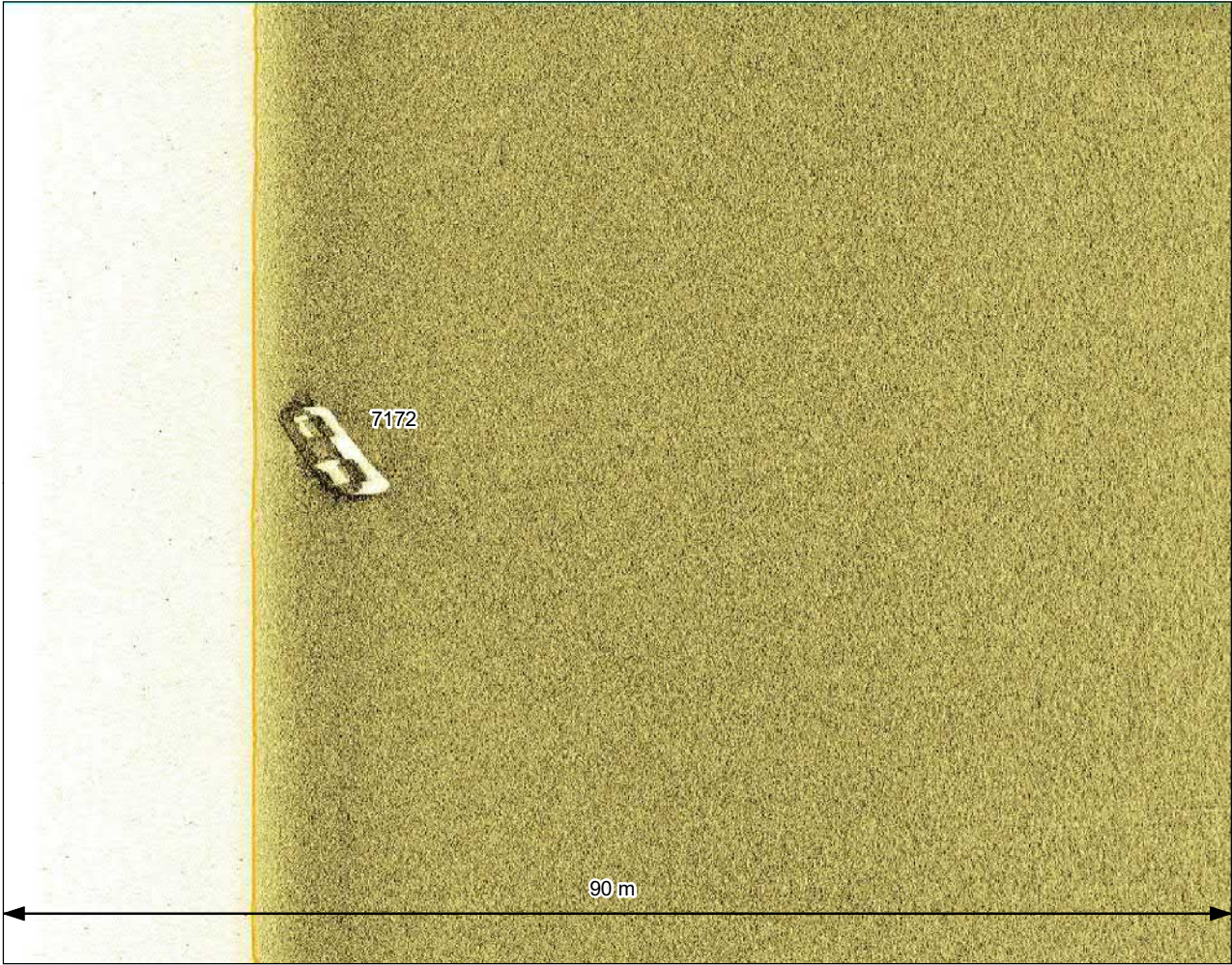
Location		617891 E 6097823 N	Area	EL1 – English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 7165 is situated in the English sector of the study area and corresponds with UKHO record 4248, <i>Eventide</i> , a non-dangerous wreck.		
		The feature is visible in the SSS dataset a slightly dispersed area of dark reflectors of varying sizes, with bright, irregular shadows, possibly indicating uneven height above seabed. The feature measures 19.6 x 5.7 x 4.0 m and is relatively isolated on a featureless area of seabed.		
		This location was not directly covered by the MBES dataset; nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. However, the UKHO record indicates it is mainly wooden in construction.		
Build	Type	Fishing vessel		
	Construction	Wooden		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Reported taking in water		
Extent of Survival		Recorded by UKHO as the wreck of <i>Eventide</i> (4248), a wooden hulled fishing vessel which sunk on 19 June 1976.		
		A previous survey, undertaken in 1988 reported an intact and partially buried wreck, with a probable mast visible and dimensions of 24.0 x 5.0 x 7.9 m.		
		In the 2021 geophysical data the wreck appears to be very poorly preserved with no identifiable structure visible, suggesting it is has significantly degraded and broken up since the last survey in 1988.		



Sidescan sonar image looking south, at 90 m range, of 7165



Location		617095 E 6090068 N	Area	EL1- English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		7172 is a possible wreck situated in the English sector of the study area. The potential wreck is oriented NNW-SSE. 7172 is associated with UKHO record 5729, an unknown wreck.		
		7172 is visible in the SSS dataset as an elongate, dark reflector with a large, bright shadow, measuring 19.3 x 5.9 x 1.6 m. The feature appears intact, with some internal structure visible as two rectangular sunken features. An irregular area of disturbed seabed, perhaps representing buried debris, is visible along the eastern edge.		
		7172 is visible in the MBES dataset as a distinct object, possibly an intact wreck, which appears to be lying upright on the seabed. Some possible scour is visible on its eastern edge.		
		This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location.		
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of Survival		7172 was first recorded in 1971, as UKHO 5729, an unknown wreck. Further survey in 1988 suggested the wreck may be lost deck cargo or a prefabricated section of an offshore installation; the feature therefore may be modern debris and not of archaeological interest. However, without confirmation of its age and origin, it has been retained as a precaution. The previous geophysical survey recorded dimensions of 20.0 x 6.0 x 1.4 m and an orientation of 168° on the seabed.		
		In the 2021 geophysical data, 7172 appears to be intact, with some internal structure surviving as two rectangular sunken features. The location of the feature within relatively featureless seabed suggests it is likely to always be exposed, with low possibility for burial.		



Sidescan sonar image looking north-east, at 90 m range, of 7172



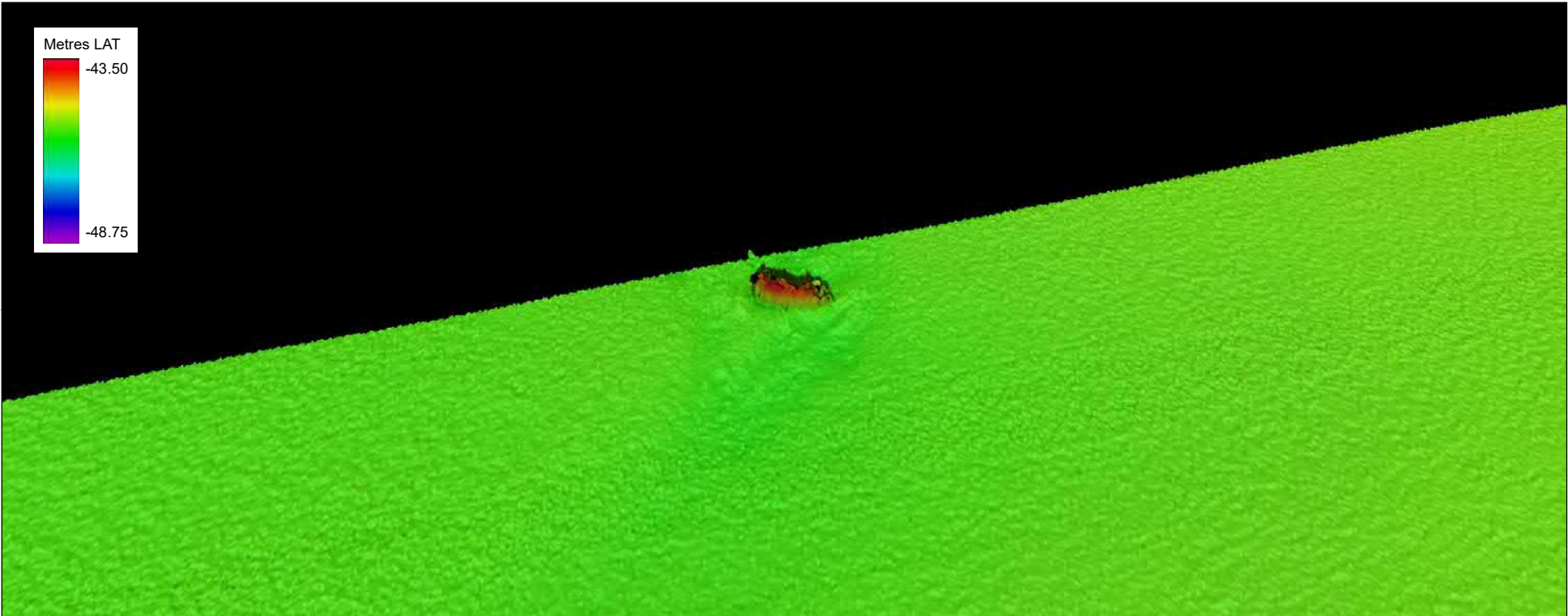
MBES grid image, x1 vertical exaggeration, looking west



Location		615196 E 6085125 N	Area	EL1 – English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 7181 is an unknown wreck situated in the English sector of the study area, orientated north-east to south-west. The wreck corresponds with UKHO record 5680, an unknown wreck.		
		In the SSS data the wreck is visible as a distinct and elongate, dark reflector, with a large and bright shadow, A larger uneven shadow is visible at its northern edge, suggesting increased, uneven height above seabed. The wreck area measures approximately 10.5 x 4.7 x 3.0 m.		
		In the MBES dataset, the wreck is visible as an elongate mound with an uneven top and appears to be intact. The wreck has associated scour extending to the north-west, measuring 20.4 x 17.2 x -0.2 m and narrowing as it extends.		
		This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location.		
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of Survival		Recorded by UKHO as an unknown, non-dangerous wreck (5680). The wreck was first recorded in 1940 and last surveyed in 2019.		
		The geophysical survey in 2019 was undertaken by the UK Civil Hydrography Programme (UK CHP), and reported the wreck to be intact and lying on its side, with wheelhouse clearly visible and measurements of 10.9 x 4.3 x 6.7 m. The lower height measurement recorded in the 2021 survey is likely due to lower resolution data or possible partial disintegration of the wreck.		
		It was reported in a survey undertaken in 1971, that numerous contacts were identified in the vicinity of the wreck, which correlates with the present geophysical survey results.		
		In the 2021 geophysical data the wreck appears to be relatively intact, although the surrounding debris items suggest there may be some partial disintegration.		



Sidescan sonar image looking north north-east, at 90 m range, of 7181



Multibeam bathymetry image of 7181, looking south-east (x1 vertical exaggeration)

PROJECT
**Scotland England Green Link 1/
Eastern Link 1**



TITLE
**Sheet 7
ID 7181 – UKHO 5680 - Unknown**

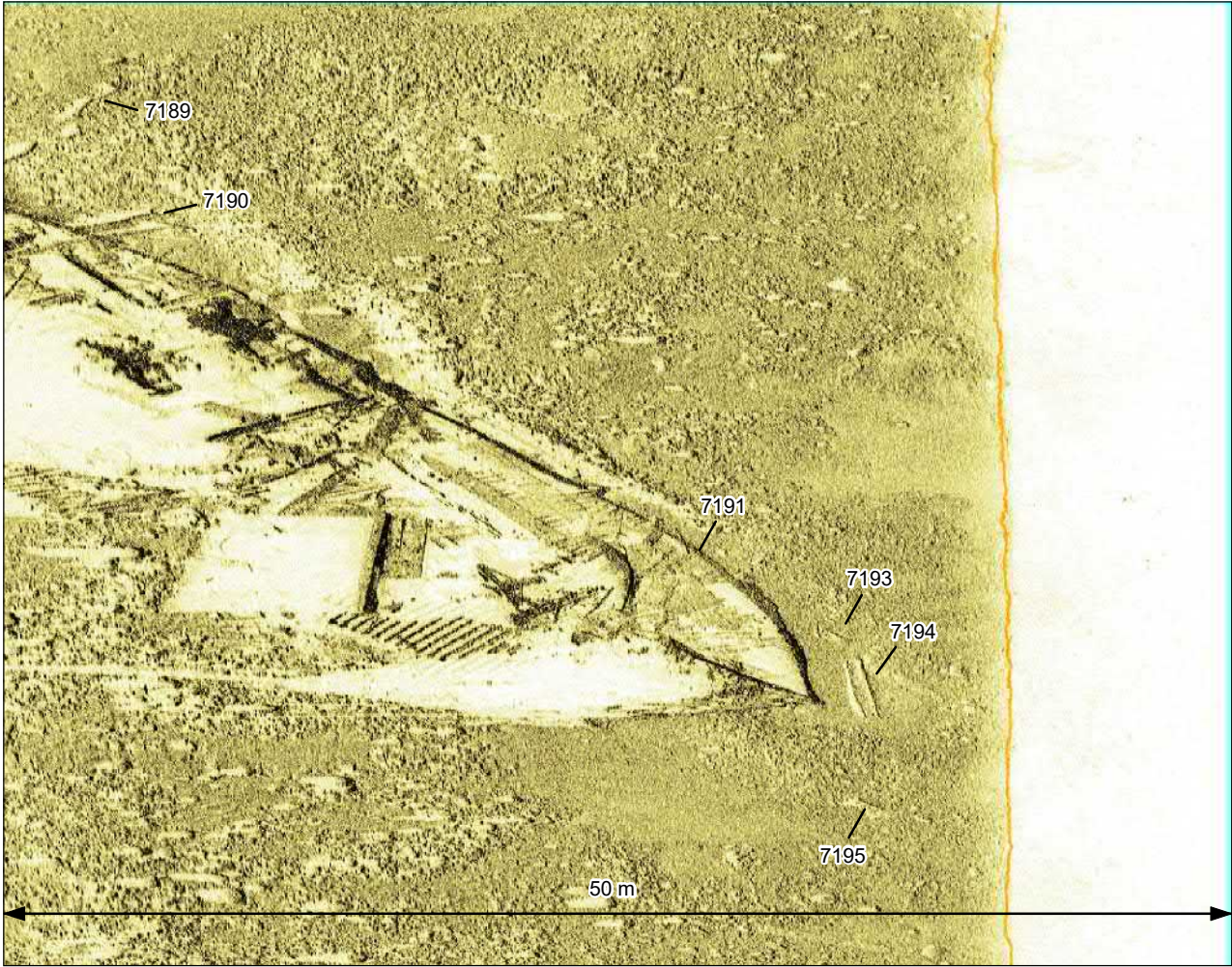
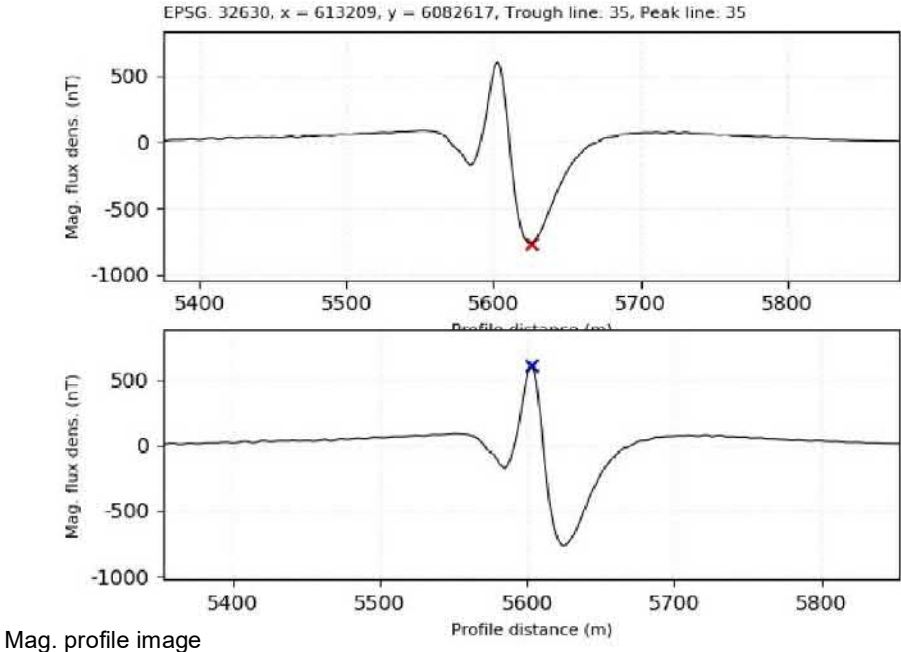
REFERENCE
SEGL1_M_SR_1_v1_20220428

SHEET NUMBER
7 of 10

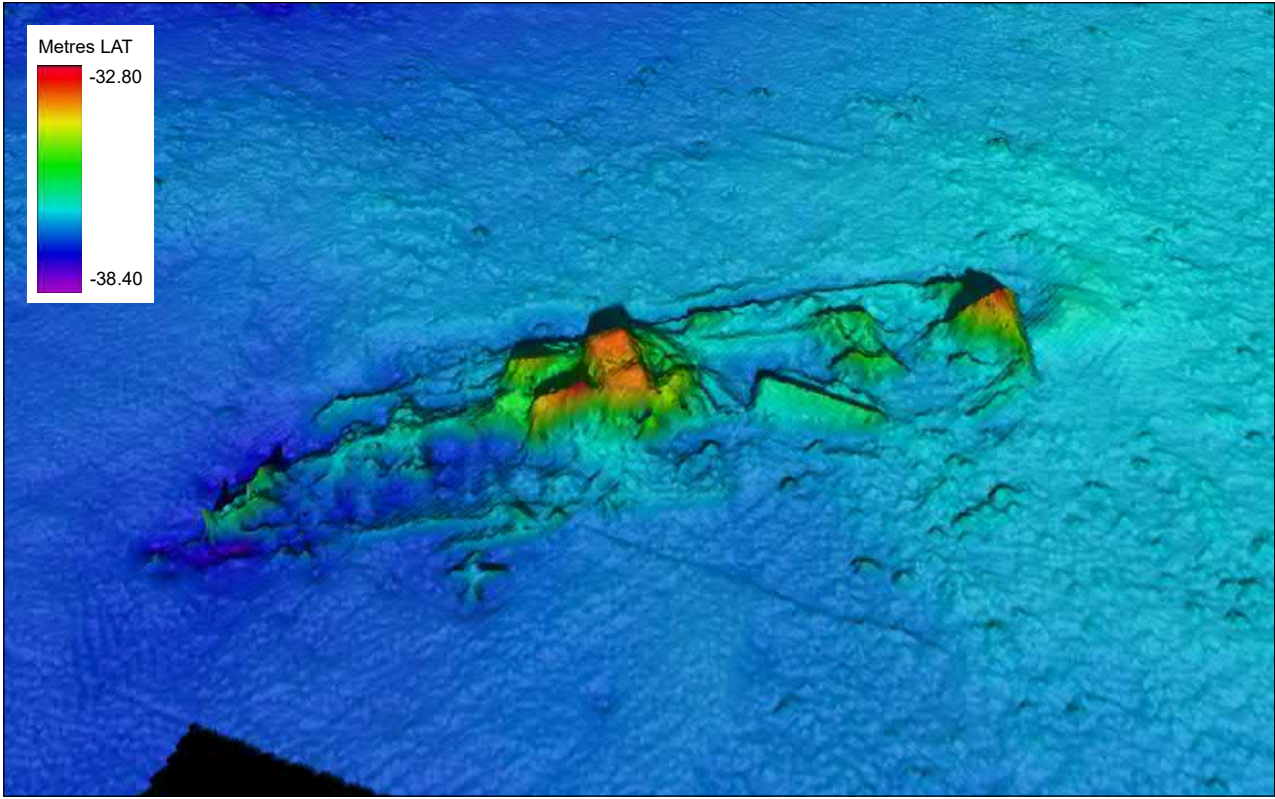
DATE
28/04/2022

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Location		613200 E 6082613 N	Area	EL1 – English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 7191 is an upright, large broken-up wreck situated in the English sector of the study area. The wreck corresponds with UKHO record 5672, the <i>Saga</i> (Possibly) and is also recorded in the National Record of the Historic Environment (NHRE 1607031).		
		The wreck is visible in the SSS dataset as a large and distinct, upright but well broken-up wreck, comprising numerous linear, sub-angular and irregular dark reflectors with bright shadows. The wreck has one particularly tall object at its southern end and a possible slatted deck visible. The wreck area measures approximately 80.3 x 35.0 x 5.3 m and is orientated north-east to south-west. Some sediment build-up is visible on the western side and some apparent scour immediately adjacent to the wreck on the east side, narrow on the southern half and broader on the northern half.		
		The wreck is visible on the MBES dataset as a partially broken up, upright wreck. The dispersed wreck has several possible items of associated debris identified in the vicinity and is located within a wider boulder field, as such there is potential for further debris to be located in the surrounding area.		
		An associated very large, sharp asymmetric dipole (1678 nT) identified within the Mag. dataset suggests ferrous construction and/or ferrous material.		
Build	Type	Steam ship		
	Construction	Unknown, but assumed partially ferrous. 1143 gross tonnage		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Torpedoed by UB 64		
Extent of Survival		Recorded by UKHO as the wreck of the <i>Saga</i> (Possibly) (5672), a Norwegian cargo vessel operating under the British Flag, built in 1901 with three-cylinder triple-expansion engine, one boiler, single shaft. The <i>Saga</i> was reportedly torpedoed by a German submarine in February 1918 during passage from Sunderland to Rouen.		
		Previous surveys report a large, partially intact wreck, measuring 75.8 x 20.2 x 6.3 m, with damage to the bow and stern with superstructure visible. A survey in 2000 reported the vessel had collapsed, exposing the boiler, engine, condenser, and donkey engine. The bow and stern-mounted machinery and a gun just off the stern were located during a diver survey in 2008. Two boilers were identified during the dive, though the <i>Saga</i> was reported as having only one boiler, and so the record was updated to be the <i>Saga</i> (Possibly).		
		In the 2021 geophysical data the wreck appears upright and heavily broken up, with remnants of the hull and deck area visible. The UKHO describes the wreck as well broken up with clearly discernible features, which correlates with the present geophysical survey results. The location of the wreck within a boulder field suggests it is likely to always be exposed, with low possibility for burial.		



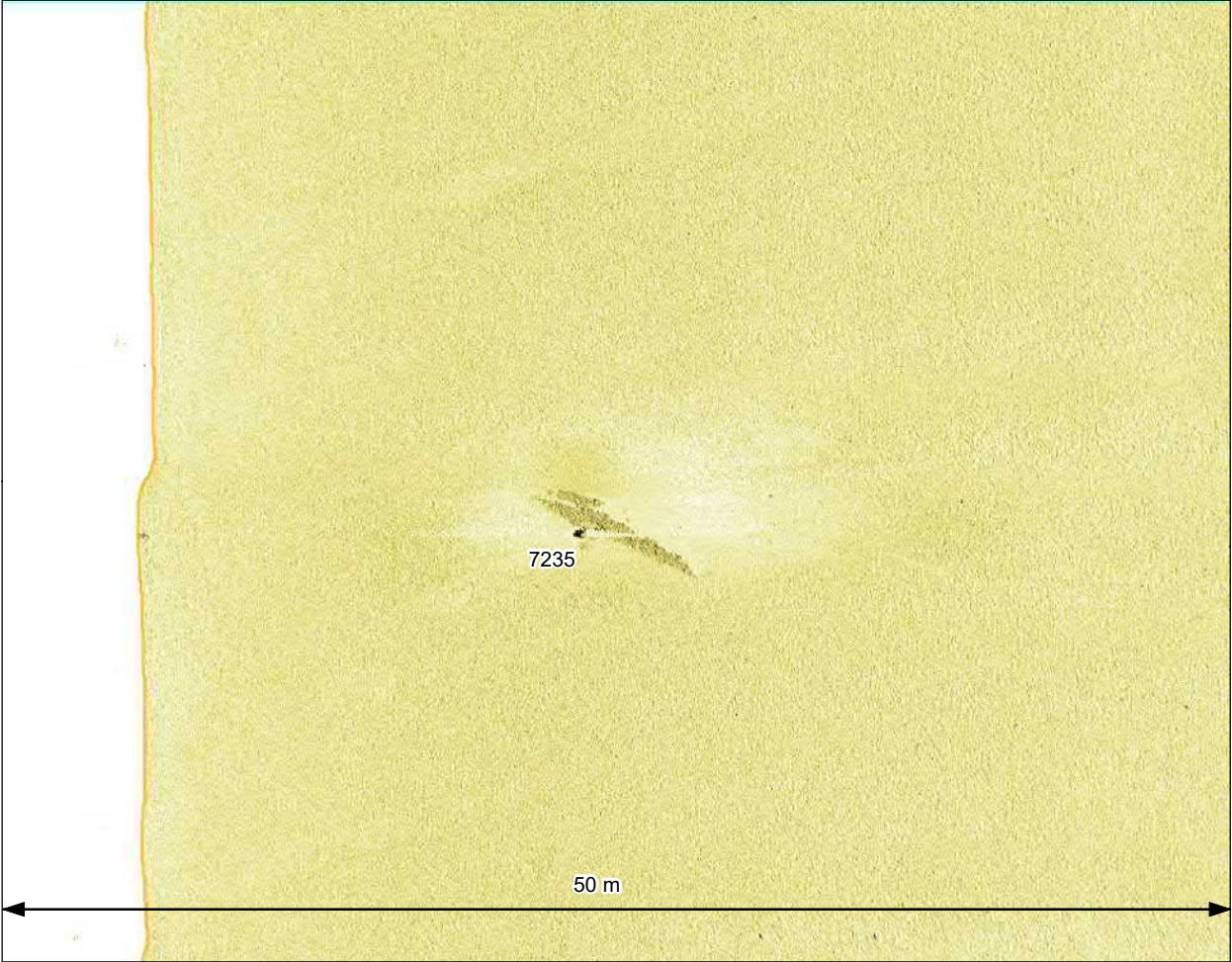
Sidescan sonar image looking north-east, at 50 m range, of 7191




MBES grid image, x1 vertical exaggeration, looking south-east



Location		607304 E 6080192 N	Area	EL1 – English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		7235 is a possible wreck situated in the English sector of the study area. 7235 corresponds with the UKHO record 89472, which describes it as an unknown, dangerous wreck.		
		The feature is visible in the SSS data as an elongate area of high reflectivity with slight height and a single distinct dark reflector with height at its centre, 12.1 x 5.8 x 0.7 m. The feature appears to be situated in a depression on an otherwise featureless area of seabed.		
		The feature is outside of the MBES and Mag. data coverage. The closest Mag. line was approximately 13 m to the south and no magnetic variation was identified, suggesting the feature is unlikely to be ferrous in construction.		
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of Survival		7235 was first recorded as an unknown wreck during a geophysical survey in 2018. In the UKHO record (89472), it is described as a wreck lying on its side, orientated 050/230 degrees on the seabed, in a general water depth of 10 m. The wreck was recorded as having dimensions of 18.3 x 5.5 x 0.8 m.		
		Based on its appearance in the SSS data, the feature does not appear to be an obvious wreck and may instead be an area of outcropping bedrock. However, based on the corresponding UKHO record, and the fact it has only been covered by one of the geophysical datasets, it has been retained here as a precaution.		



Sidescan sonar image looking west south-west, at 50 m range, of 7235



PROJECT

Scotland England Green Link 1/
Eastern Link 1

TITLE

Sheet 9
ID 7235 – UKHO 89472 - Unknown

REFERENCE

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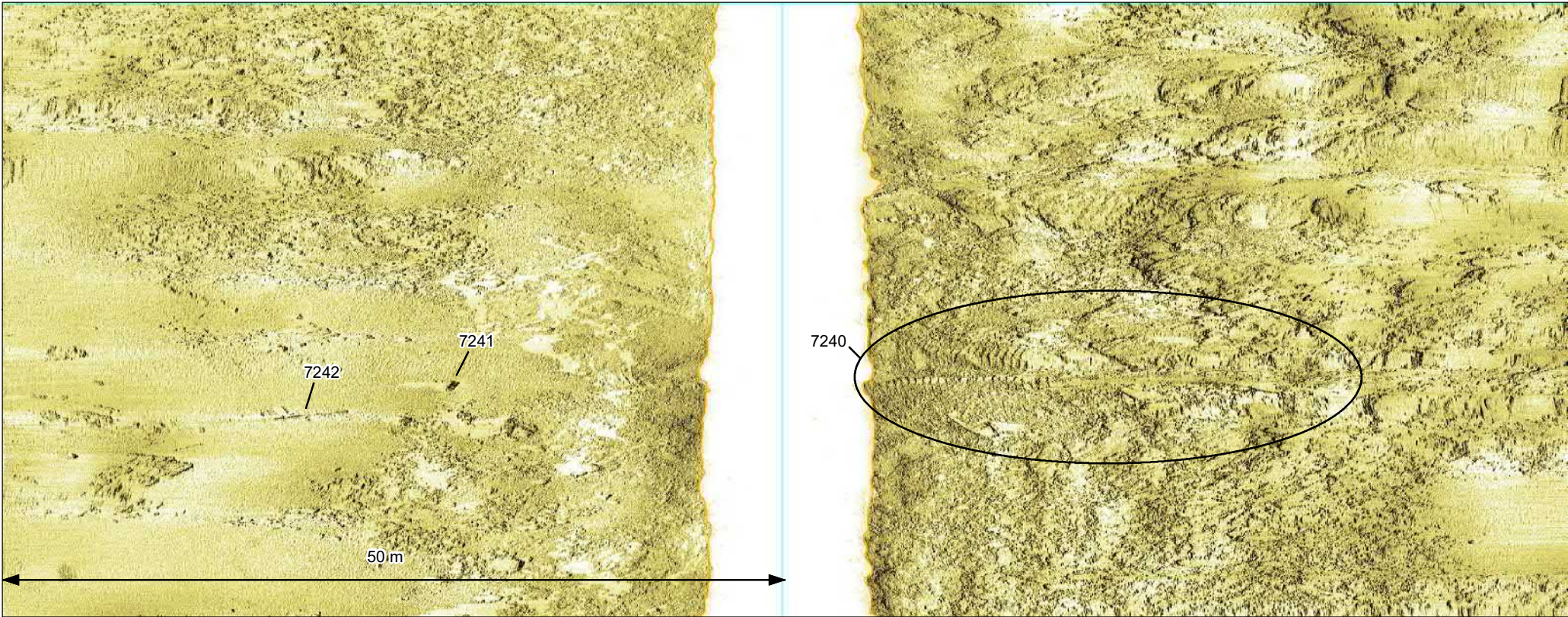
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Location		606618 E 6079955 N	Area	EL1 – English Sector
Archaeological Importance		High		
Geophysical survey dimensions and notes		Debris field 7240 is situated in the English sector of the study area. There is no corresponding UKHO record.		
		This feature has been identified in the SSS dataset as a large area of debris comprising at least two areas of regularly spaced elongate dark reflectors indicating possible structural remains, as well as more irregularly positioned elongate dark reflectors. The debris field extends for 49.4 x 18.8 x 0.2 m, and appears fairly dispersed in an area of bedrock.		
		It is likely that features 7241 and 7242 are related debris items. These are located approximately 10 m to the south-west. 7241 is an angular dark reflector measuring 1.5 x 1.3 x 0.6 m, 7242 is an elongate dark reflector with slight perpendicular protrusions along the length. It measures 5.4 x 0.5 x 0.5 m.		
		There is a very large magnetic anomaly associated with this debris field with an amplitude of 9783 nT, suggesting ferrous construction and/or ferrous material.		
Build	Type	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	Cause	Unknown		
Extent of Survival		Feature 7240 has no associated wreck record and therefore no comment can be made on its origin or previous condition. It is located approximately 350 m south-west of UKHO record 57777, which is that of the steamship <i>Norman</i> which sank in 1881 after becoming stranded. During the most recent investigation in 2018, the wreckage was considered to be part of a rocky outcrop and the record was amended to being dead; however, in a previous investigation in 1999, the wreck was reported as being identified as a few pieces of scattered iron in an area of rocky ground with very little recognisable structure, which is similar to the form of 7240 . It should also be noted that the admiralty chart for the region shows an area of foul ground close to the interpreted debris field. It is therefore possible that 7240 represents a spread of modern debris which is of no archaeological importance, or possibly a dispersed area of wreckage, possibly related to UKHO record 57777. However, this cannot be confirmed without further investigation.		
		In the 2021 geophysical data, some possible coherent structure can be identified; however, it is not clear enough to be definitively considered wreck remains. Further investigation would be needed to determine the exact nature of this debris. The debris appears broken up and dispersed within a wider area of bedrock outcropping in the nearshore area. Due to its location in an area of outcropping bedrock, the potential for burial appears low.		



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Sidescan sonar image looking NNW, at 50 m range, of 7240, 7241 and 7242

PROJECT

Scotland England Green Link 1/
Eastern Link 1



TITLE

Sheet 10
ID 7240 – Unknown

REFERENCE

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A2 Anomalies

The remaining 215 features within the geophysical study area have all been discriminated as A2 during this appraisal. A full gazetteer is provided in Appendix D, including KP reference.

Of these A2 anomalies, three features (**7069** (KP 30), **7083** (KP 46) and **7102** (KP 71)) have been classified as debris fields. The largest of these is possible debris field **7102** (KP 71) which was identified as a distinct area (measuring 18.4 x 15.1) containing small, rounded dark reflectors with height, the largest of which measures 2.6 x 1.5 x 0.6 m.

Debris field **7069** (KP 30) was identified in the SSS data as a cluster of irregular dark reflectors, possibly four objects or two elongate objects, with highly irregular shadows. The feature was seen to have dimensions of 14.1 x 12.1 x 1.2 m. This was interpreted by Fugro as a possible wreck site (Fugro, 2021a) (Fugro, 2021c); however, based on its form in the geophysical data, it has been classified as a debris field here and discriminated as an A2 feature of possible archaeological interest as its origin is not certain. The feature is located approximately 560 m north-east of UKHO position 4496, which is that of the steam ship *Baron Stjernbald*, which sank in 1917 after being torpedoed; however, based on the distance between the two positions, as well as the information within the UKHO record which notes that when surveyed in 2002 it had dimensions of 64 x 10 x 9.8 m compared with those of the feature identified in the SSS data, the two are not thought to be associated.

A total of 14 A2 anomalies have been classified as items of debris (**7016** (KP 2), **7021** (KP 2), **7036**, (KP 5), **7072** (KP 36), **7076** (KP 40), **7081** (KP 46), **7090** (KP 57), **7096** (KP 63), **7118** (KP 86), **7131** (KP 100), **7144** (KP 115), **7205** (KP 170), **7223** (KP 174) and **7227** (KP 175)) (Figure 12-1.7). The largest of these was **7131** (KP 100), which was identified in the SSS data as a large, distinct, rectangular dark reflector measuring 4.4 x 1.9 x 1.1 m with a linear protrusion extending 17.9 m to the north-west. It is possible that this represents one large item of debris, with overall dimensions of 22.3 x 1.9 x 1.1 m, or two separate but associated objects. **7131** (KP 100) was not covered by the Mag. dataset and therefore it is not possible to ascertain whether ferrous material is present at this location.

The second largest was possible debris item **7118** (KP 86), which was identified in the SSS data as a large object measuring 20.0 x 12.1 x 2.8 m, with complex, textured internal reflectors and a large, tapered shadow. The feature is not particularly distinct and has the potential to represent possible geological outcropping; however, the associated shadow and significant height in an otherwise relatively flat area of seabed make the feature appear anomalous and, as such, it has been classified as debris as a precaution.

A total of 64 A2 anomalies were classified as dark reflectors (for full list, please see Appendix D). The largest of these was **7084** (KP 49) which was identified in the SSS data as an irregular, elongate feature, measuring 10.4 x 0.6 x 0.4 m. The feature comprises a distinct dark reflector with height and a bright reflector, both of which are joined by a linear dark reflector. This may represent one, large, irregular feature or two or more separate but associated features.

Three A2 anomalies have been classified as bright reflectors (**7091** (KP 57), **7105** (KP 73) and **7215** (KP 172)). The largest of these was **7105** (KP 73) which was identified in the SSS data as an irregularly shaped bright reflector, measuring 5.0 x 2.2 m, in a relatively isolated area of seabed (Figure 12-1.7). These have the potential of representing debris item but may be natural features.

A total of 20 A2 anomalies have been classified as lengths of rope or chain (for full list, please see Appendix D). The longest of these was **7147** (KP 119), which was identified in the SSS data as a series of dark reflectors with shadows measuring approximately 1.8 x 1.8 x 0.3 m, with a faint, linear dark reflector joining them with a total length of 300 m. A number of similar features have been identified throughout the geophysical study area (**7064** (KP 22), **7130** (KP 99) and **7216** (KP 172)) and may represent modern features such as fishing gear; however, as this cannot be confirmed without further investigation, the features have been retained as a precaution. Lengths of rope and chain may not be of archaeological potential in themselves, but they may be attached to archaeological features (e.g. anchors) or be snagged on mostly buried debris not visible in the SSS or MBES data.

A total of 14 A2 anomalies have been classified as seabed disturbances (for full list, please see Appendix D). The largest of these is feature **7119** (KP 86) which was identified in the SSS data as a large area containing numerous small dark reflectors with tapered shadows. This may be natural,

however due to the proximity to possible debris item **7118** (KP 86) to the north-west, it has been retained as a precaution. May represent a natural feature or may represent a possible debris field.

A total of nine A2 anomalies have been classified as mounds (**7019** (KP 2), **7044-7046** (KP 6), **7057** (KP 17), **7100** (KP 69), **7107** (KP 73), **7126** (KP 96) and **7208** (KP 170)). The largest of which is feature **7107** (KP 73) which was identified in the MBES data as an elongate mound measuring 5.9 x 2.4 x 0.3 m.

The remaining 91 A2 anomalies have been classified as magnetic anomalies (for full list, please see Appendix D). These are anomalies that have been identified in the Mag. data but have no anomalous corresponding features identified in the SSS or MBES data. These range in size from 5 nT (**7151-7153** (KP 138-139)) to 957 nT (**7074** (KP 37)) and are considered to be ferrous items of debris which are either buried or have no surface expression.

It should be noted that, due to the limited Mag. coverage, it is not possible to ascertain whether a majority of the features discussed here contain, or are composed of, ferrous material. Furthermore, there may be additional ferrous features of archaeological potential which are either buried or have no surface expression, which have not been identified within the study area at this time due to the limited Mag. coverage.

12.4.2.5 Maritime Archaeological Potential

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

As an island nation, the UK has a long maritime history with potential for the archaeological evidence of maritime sites from the late Mesolithic through to the present day. Maritime sites are defined for the purposes of this appraisal as either wrecks (seagoing vessels or aircraft) and/or material that has been accidentally or deliberately lost overboard from a vessel or aircraft. The marine installation corridor lies close to some of the historic shipping routes for British vessels travel along the Scottish East Coast and between the North East of England and London, with vessels stopping at intermediate ports, including Blyth and Sunderland. The main drivers for these routes were the trade in coal, ship building, the steel industry, and the fishing industry.

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 PMRA 1986.

Prehistoric Potential

Identified human occupation sites in Northwest Europe imply that sea voyages were conducted as early as 7,000 BC, though no archaeological remains of vessels that pre-date the Mesolithic have been found in Western Europe. This may reflect the very low probability of organic remains of this type surviving, with the record currently consists of log boats. Hide boats are believed to have been used to colonise North America c.30,000-20,000 BP and therefore it seems probable that similar vessels would have been used in Mesolithic North West Europe. The oldest log boat in Europe, the Pesse canoe, is dated to 7,920 - 6,470 BC. Primarily used for transport or fishing in inland and sheltered waters they are generally considered to be unsuited to the open sea.

The earliest log boat identified in Scotland comes from Dumfriesshire dating to the early Bronze Age. A log boat with a separate transom and dating to about 1,500 BC has been found in Loch Tay, with a late Bronze Age log boat also found in the Tay Estuary, dating to between 1,130 - 970 BC. No prehistoric boats of complex construction or capable of being reliably used in open, maritime water have currently been found in Scotland.

During the Bronze Age (2,400 BC to 700 BC) technological changes increased the opportunities for coastal and open sea voyaging. In addition to the established form of the log boat, with a late Bronze Age example found at Brigg in Lincolnshire, new construction methods were employed in the form of sewn plank boats. Five are known from the central North Sea coastal region, at Brigg, North Ferriby, and Kilnsea, with a possible additional vessel from Hartlepool's submerged forest identified. Coastal and continental trade, along with sea fishing increased during the Neolithic, Bronze, and Iron Age, with small ports or anchorages developed as this activity grew.

Romano-British Period

Iron Age vessels are known from eastern England from Iron Age coin evidence, the writings of Julius Caesar and the recovery of a sophisticated anchor off Dorset. In the period preceding the Claudian invasion in AD 43 the Greek geographer Strabo mentions trade from Britain and lists a variety of goods typically exported to various points on continental Europe, again implying sea-travel.

The Romano-British period (43-410 AD) saw an increase in seaborne trade and naval activity around the coast of the Roman province of Britannia and to mainland Europe. In North East Scotland the extent to which the scale and character of pre-existing maritime transport and trade was affected is not known. It probably continued much as before, except perhaps in times of war or tension. The Romans invaded Britain in AD 43 quickly seizing the south of England and pushed northwards, reaching the Humber by AD 47. They seem to have had the North East and Yorkshire under control by the reign of Hadrian, from

AD 117. The presence of a wide range of imported goods from both latter Iron Age and Roman contexts suggest that prior to the invasion there were already strong coastal trade links.

Excavated examples of Romano-British (AD 43 – AD 410) vessels show that larger, iron fastened, plank-built ships were in use, capable of ocean voyages, although it is likely that smaller local craft also continued in use. The archaeological evidence for the Romano-British period in the coastal region of the North East is relatively sparse. It has been argued that the legionary fortress at South Shields may have had an associated port facility as part of its role as a supply centre. Tacitus described the activities of the British fleet in the north of Britain in the 1st century AD and there appears to have been a significant increase in maritime traffic from the Hadrianic period onwards (2nd century AD). Two possible wreck sites in the North East from this period have been suggested, at Herd Sands, South Shields, and Hartlepool Bay.

By the end of the 4th century, Britain's eastern coast was coming under attack from Germanic raiders leading the Romans to build signal stations along the south and east coasts. There would also have been Roman naval activity at various times to support expeditionary and occupation forces and probably to suppress attacks on merchant shipping. It is also probably safe to assume that Roman military garrisons will have depended to some extent upon supplies arriving by sea. Their presence may also have stimulated some trade between the areas temporarily occupied and the rest of the province.

Medieval Potential

The volume and nature of shipping activity following the collapse of the Roman Empire is poorly understood with a lack of evidence from the early medieval period (AD 410 – AD 1066), particularly in the earlier part of the period. Maritime activity within the area would have included both coastal shipping and movement across the North Sea. The military use of ships by the Kingdom of Northumbria is recorded in the 7th century when Northumbria was the most powerful kingdom in Britain. The 7th and 8th centuries were mainly ones of peace which allowed commerce to flourish and prosper and ports to develop in some cases into undefended urban complexes.

The 5th to 9th centuries saw immense changes around the North Sea, beginning with the great movement of Germanic peoples from the continent to the UK, the adoption of Christianity and the formation of states under royal rule, the resurgence of international trade and finally, the Viking incursions. From the late 8th century raiding activity by the Vikings is historically attested, with records of raids on the monasteries at Monkwearmouth and Lindisfarne in this period. Frequent voyaging across the North Sea for raiding, colonisation and trading can be assumed and therefore the potential for wrecks can also be assumed. Their activities effectively disrupted trade in the 9th century and may have been instrumental in the desertion of several formerly important ports.

Dunbar has long been known as a town of three harbours, with the earliest harbour at Belhaven Bay known to have been present as early as 1164. The coastal communities along East Lothian traded in surplus fish, including salmon and herring being exported to Europe by the 1400s. 'Fishertowns' of Dunbar, Fisherrow and North Berwick all became centres for fishermen and their families.

Over the course of the medieval period (AD 1066 – AD 1499) there was significant development of quayside facilities at Newcastle, indicating the growth of trade. Other changes include an apparent change to and intensification of fishing for deep water fish species. Other ports such as Blyth were principally fishing villages during this period. Long distance trade was initially dominated by routes to France and Flanders, with the Baltic and German trade becoming more important through the period. The coal trade also began in the medieval period.

Many ships during this period were also provided periodically to the crown for military use and would have moved through the area during the various Anglo-Scottish wars, sometimes transporting troops, but mainly to supply English campaigns and garrisons. The first castle at Scarborough was built in 1135 and it developed into one of the most powerful castles in the north of England; the medieval town originating in a borough founded by Henry II in about 1163. The founding of Scarborough was part of a much wider trend towards urban generation along the east coast of both Scotland and England during the medieval period as economic factors led to the expansion of ports, some developing from pre-conquest towns and others planned as new towns on unoccupied sites. Shipping was important along the North East coast in the medieval period where it supplied the domestic needs of villages, towns and abbeys and brought in goods that were difficult to bring by road.

By 1300 England's east coast fisheries were a large, complex, highly regulated, and widely dispersed industry. They were of international importance, supplying not only local demand but also supporting a major export trade. Towards the 15th century there was a trend away from inshore to distant-water fishing because of improved curing techniques allowing vessels to stay at sea longer.

Post-Medieval Potential

Trade activity intensified in the wider region during the post-medieval period (AD 1500 to 1799). Much of this related to an increase in intensity of coal extraction, with improvements and extensions to facilities made to established ports in the region at this time. Blyth for example becoming an active coal port during this period, with new infrastructure including a ballast quay and a coal quay. Fishing continued to be very important to the local economies, though by the early 17th century the English fishery was waning as a result of competition from foreign vessels, especially the Dutch herring fleets.

The Act of Union of 1707 opened the English market, particularly London and the English colonies, to Scottish merchants. Trade with the American colonies became particularly important, with woollen and linen goods, salmon, salted herrings, and French wine being exported, together with emigrants.

Despite England, and subsequently the UK, being involved in significant number of maritime conflicts during this period, no major naval actions occurred within the study area. Other military actions, however, including activity targeting merchant vessels, such as privateering, may have led to unrecorded losses within the area.

18th and 19th Century Potential

The period following the end of the Napoleonic Wars saw dramatic revolutions in ship design as first iron, and then steel, replaced wood in ship construction, and steam replaced sail as the principle means of propulsion. Tramp sail and then steamships dominated maritime trade in the 19th and early 20th centuries, with a demand for coal to operate some of the steamships but also for industries located inland along the east coast. This increase in maritime traffic was further accentuated by the industrial revolution.

Between 1840 and 1860, trawling expanded dramatically as the principal means of capturing white fish and by the mid-1870s, the expansion of the smack trawl fishery was nearing its peak. In summer, trawlers visited grounds off the Danish, German, Dutch and Belgian coasts. In winter, they mainly worked banks adjacent to the Dogger. Around Britain's coastline there were still thousands of small craft propelled by sail and oar; but in the Irish Sea, the Channel, and the North Sea, fleets of steam-powered trawlers were operating. By the 1900s trading by sea has decline at many East Lothian harbours, due to the competing larger commercial fishing vessels.

20th Century Potential

The industrial centres along the east coast made it a key target for Germany during the First World War and this stretch of water was also a particularly dangerous place for shipping during that war. In the first decade of the 20th century 'one quarter of the global output of the shipbuilding industry was produced on the banks of the North East region's three principal rivers, the Tyne, Wear and Tees'. After the First World War trade inevitably 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.

During the latter part of the First World War and all through the Second World War coastal convoys were instituted by the government using the East Coast War Channels. These moved north and south along the east coast, between East Lothian, Northumberland and down to London, and coal was a major component of the cargoes carried, essential to keep industries in southern Britain, including war industries, in action. The types of losses associated with both 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, aircraft losses were particularly significant along the east coast because of the relative proximity of German-held airfields to 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.

The aftermath of the Second World War, along with factors such as the European fisheries policy, has led to a decline in the fishing, shipbuilding and other industries down the east coast of the UK, and the oil and gas industries have led to revivals for some communities after decades of underinvestment.

Recorded Losses

Recorded Losses can be considered as an indication of the potential for archaeological maritime remains to exist within the ASA and the type and number of wrecks that could be present. These records relate to vessels reportedly lost for which no physical wreck remains have ever been identified. Table 12-10 shows the distribution of these documented losses according to the date of loss for those records whose positions fall within the ASA. Details regarding these losses are presented in Appendix E.

Table 12-10: Recorded Losses – summary by date

Date	Number of records of ships	Number of records of aircraft
Post-medieval	1	Nil
19 th century	17	Nil
Modern	9	Nil
Unknown	35	Nil
Total	62	Nil

Recorded Losses are predominantly reported to have stranded in coastal areas, a majority for which consist of unidentified seabed obstructions reported by fishermen, fishing vessels, cargo vessels and sailing vessels.

No Recorded Losses are recorded prior to the beginning of the post-medieval period, and while this to some extent could represent a significant increase in shipping during the post medieval period, it could also be a reflection of the improvements in record keeping, and the maintaining of those records, having improved significantly.

Overview of Potential

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 12-11 below, which have been based on the approach outlines in Section 12.3.4.2 of this chapter.

Table 12-11: 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.
	Low potential for material associated with coastal and seafaring activity in the 'Dark

Period	Summary
	<p>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.</p> <p>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 reliable navigation techniques and the use of ordnance.</p>
1500 to 1815	<p>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.</p> <p>Medium potential for post-medieval shipwrecks associated with the expansion of transoceanic communications and the opening up of the New World.</p> <p>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.</p> <p>Medium potential for post-medieval shipwrecks associated with continuing local trade and marine exploitation including the transport of goods associated with the agricultural revolution.</p>
1816 to 1913	<p>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.</p> <p>Higher potential for the discovery of shipwrecks demonstrating a diverse array of vernacular boat types evolved for use in specific environments.</p> <p>Higher potential for wrecks associated with large scale worldwide trade, the fishing industry or coastal maritime activity including marine exploitation.</p>
1914 to 1945	<p>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.</p>
Post-1946	<p>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, losses 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 weather conditions, collision with other vessels or navigational hazards or mechanical faults.</p>

12.4.2.6 Value

The present appraisal of the value of known and potential archaeology within the study area is based on data from the UKHO, NRHE, CANMORE, and the HER's, and archaeological appraisal of the geophysical survey data. This appraisal is based on the criteria for appraising archaeological value, as set out in Table 12-5, and based on available guidance (English Heritage (now Historic England), 2012).

Each wreck should be appraised 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 appraisal of the sites, based

on date categories defined by the Marine Class Description and Principles of Selection (Wessex Archaeology, 2008b).

Four wrecks have been identified and named; the two oldest wrecks are the *Saga* (**7191**) and *Morlaix* (**7137**). The *Saga* was a coal cargo steamship (collier class) built in 1901 by Burmeister & Wain's Maskin & Skibsbyggeri, Copenhagen and propelled by means of a triple expansion engine with a single boiler. At the time of sinking, the vessel was owned by The Shipping Controller (London) and was en route from Sunderland to Rouen with a cargo of coal. The vessel was torpedoed by German submarine UB-64 in 1918 off Sunderland. The *Morlaix* (**7137**) was a British cargo steamship built in 1911 by Goole Shipbuilding & Repairing Co. Ltd., Goole. The vessel was propelled by means of a triple expansion engine and at the time of sinking was owned by Cuthbert Brown & Co., Cardiff. The vessel sunk by collision with the trawler *Finlande* on 5 May 1942 en route from Macduff to Sunderland in ballast.

These ships belong to a period when there were great changes being made to the way in which vessels were built and used, and although examples of vessels from this period are generally more numerous in the archaeological record, those that contribute to an understanding of these changes would be considered as having increased value. As the wreck of the *Saga* is classified as a war casualty and could be of equivalent archaeological value to wrecks that are already designated it should be considered of **high** value. Similarly, until further evaluation is undertaken the wreck of *Morlaix* is also considered to be of **high** value.

The other identified site is the debris field of the possibly steamship *Maystone* (**7095**), a British cargo vessel built in 1945 by Grangemouth Dockyard Co. Ltd., Grangemouth. The vessel was propelled by a triple expansion engine with two single boilers and machinery located aft. It was last owned by Thomas Stone Shipping Ltd., Dundee. The vessel sank after collision with the aircraft carrier HMS *Albion* during a gale storm in October 1949, on voyage from Methil to London carrying a cargo of coal. Record **7095** should be considered of **high** value until further evaluation is undertaken to determine the significance of the site.

The fourth identified wreck is that of *Eventide* (**7165**), which should be considered to be of **medium** value until more information becomes available. This previously recorded wreck consisted of a small British wooden motor fishing vessel which sank in June 1976, possibly due to a water leakage.

For the wrecks and possible wrecks that have not been named and that are of unknown date (**7051**, **7158**, **7181**, **7235** **7240**), their value is presently unknown, but should be considered as **high** value until proven otherwise.

The other unknown site (**7172**) has been suggested to consists of lost deck cargo and sections of an offshore installation. Although this should be considered as **low** value, this has been retained as a possible wreck site until more information is made available.

UKHO record (**2002**) which does not have geophysical survey data coverage cannot yet be evaluated and so should be considered to be of **high** value.

As there is insufficient information to appraise the value of each individual unidentified A2 anomaly, identified in the geophysical appraisal, all of these additional anomalies must be considered to have **high** archaeological value until more information becomes available.

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.

12.4.2.7 Aviation Archaeological Potential

The appraisal of potential for the discovery of aircraft crash sites and aircraft derived material within the marine installation corridor draws on the results of the geophysical survey and desk-based research combined with further research of the wider area.

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

A guidance note published by English Heritage (now Historic England) entitled *Military Aircraft Crash Sites* (English Heritage (now Historic England), 2002) 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 (ibid.: 2). All aircraft that crashed while in military service are automatically protected under the PMRA 1986.

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.

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 (Wessex Archaeology, 2009):65) and a further 34 aircraft from the British Home Defence Squadrons are also recorded to have been lost during this period (Holyoak, 2002):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.

During the interwar period, civil aviation increased significantly, with overseas services established to a number of European and worldwide destinations (Wessex Archaeology, 2009):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 (Wessex Archaeology, 2009):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 (Wessex Archaeology, 2009):65).

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.

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 First World War with hostile aircraft activity particularly concentrated off the east and south coasts of England (Wessex Archaeology, 2008b):16). There are at least eleven airfields in Northumberland, and eleven in North Yorkshire that date to the Second World War, combining 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. Within East Lothian the airfields of Drem, East Fortune, Penston Aerodrome (Macmerry Airfield) and SLG 27 Lennoxlove provided protection for the coastline but were also utilised as operational training bases during the Wars.

The *Aircraft Crash Sites at Sea* project (Wessex Archaeology, 2008b) considered a selection of sources which may be considered to indicate the potential for aircraft remains of this period to exist within the marine installation corridor. 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 (Wessex Archaeology, 2008b):18).

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 (Wessex Archaeology, 2008b):66), and civilian losses are likely to have been reported and recorded.

Recorded Losses

A number of recorded losses are located within the wider area; at least 28 recorded aircraft crash sites have been identified at sea within the 12 NM limit, including two that lie within 1 km of the ASA as recorded in the HER's for the area. As these are recorded losses the positional data is unreliable and serve only to provide an indication of the types of aircraft that flew over this coastline. In many cases the location is only a set of general coordinates, a general distance and bearing from a landmark, or the location of the crew's dinghy, or recovered remains.

Overview of Potential

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.

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

Table 12-12: 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 WWI.
	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 WWII 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.

12.4.2.8 Value

The present appraisal of the value of known and potential archaeology within the study area is based on data from the UKHO, NRHE and HER and the archaeological assessment of geophysical survey data. This appraisal is based on the criteria for assessing archaeological value as set out in Section 12.3.4.2 and within Table 12-5, and based on available guidance (Wessex Archaeology, 2011).

As it is currently unknown whether the remains of any aircraft are located within the ASA, it is not known whether there are any aircraft which crashed while in military service, and therefore automatically protected under the PMRA 1986. It is known that there were a significant number of airfields in the region during the Second World War, therefore it may be assumed that any material identified during the survey phase of the works will be of potential **high** value.

It is also conceivable that any of the 215 unidentified geophysical anomalies could be identified as aircraft crash sites, and subsequently are presently considered of **high** archaeological value.

It is known that there were a significant number of airfields in the region during the Second World War, therefore, there is a higher potential for aircraft material to be discovered along this stretch of coastline and offshore.

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.

12.4.3 Intertidal Heritage Assets and Potential

There are no records relating to archaeological sites, artefacts, material and standing remains within the intertidal zone (to MHWS) of the proposed landfalls. However, generally coastal areas, particularly soft sandy coasts, may contain an array of isolated finds from a wide range of archaeological periods.

At the Scottish landfall, within the ASA, there are a number of sites recorded by Canmore and the HER's. Four records (Canmore_325631, 327686, 329683, 326380) consist of maritime records - recorded losses discussed above, and one terrestrial record located above MHWS consists of mine workings dating from the 18th to 20th century (Canmore_365960).

At the English landfall, within the ASA, there are 22 terrestrial sites recorded by the English HER's, though none fall below MHWS. One asset consists of a round concrete pillbox (NRHE_1421198), constructed during Second World War.

12.4.4 Historic Seascape Character

Scotland

No Historic Seascape Characterisation studies have been carried out within Scotland and therefore an HSC appraisal has not been undertaken for the area within Scottish territorial waters. The seascape within the ASA in Scottish territorial waters is likely to have been heavily shaped by similar processes to that described within English waters, particularly fisheries, industry and navigation.

England

The North East Seascape Characterisation Assessment Report identified the Marine Character Areas around the published Seascape Characterisation around the English Coast published by English Nature (2012). The relevant ones to this report are:

- MCA 22 Tyne, Tees and Wear Estuaries and Coastal Waters;
- MCA 23 Rural Northumberland and Coastal Waters;
- MCA 25 Farne Deep; and
- MCA 26 Berwick Bank.

Each area key characterisations are listed along with adjacent National Character Areas (NCAs) based on Natural England's 'seascape wheel'².

SeaZone Solutions Limited carried out a pilot study demonstrating the methodology for the Historic Seascape Characterisation (HSC) in 2008 of the North East of England covering between the England Scotland border in the north to close to Withernsea in the south. This area covers parts of the counties of Humberside, Durham and Northumberland, the North Yorkshire Moors National Park, and the unitary authorities Tyne and Wear, East Riding, and Cleveland.

The method appraises 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. This is achieved by splitting the marine zone into five tiered levels: the coastal area (Table 12-13), the sea surface

Table 12-14), the pelagic character or water column (

Table 12-15), the benthic character or sea floor (Table 12-16), and the sub-benthic character or subsea floor (**Table 12-17**). The characterisation is GIS based, enabling key characteristics to be identified. The results of the characterisation of each level are summarised in the five following tables.

² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/396177/seascape-character-assessment.pdf

The known and potential prehistoric, maritime and aviation heritage assets that form part of the HSC have been discussed in the relevant baseline characterisations above.

Table 12-13: Seascape Characterisation – coastal area

Broad Character Types	Character Types	Character Sub-Types
Coastal Infrastructure	Flood and erosion defences	Sea defence
Communications	Telecommunications	Submarine telecommunications cable
Cultural topography	Cultural topography (inter-tidal)	Shingle foreshore Sandy foreshore
	Cultural topography (marine)	Coarse sediment plains Fine sediment plains
	Cultural topography (landward)	Cliff Dunes
	Palaeolandscape component	Palaeolandscape component Palaeochannel
Fishing	Fishing	Fixed netting Bottom trawling
Industry	Energy industry	Submarine power cable Renewable energy installation (wind)
	Shipping industry	Commercial shipping route
Navigation	Navigation activity	Navigation route Anchorage
	Maritime safety	Buoyage
	Navigation hazard	Shoals and flats Wreck hazard
Ports and docks	Ports and docks	Dockyard (Civilian) Landing point Harbour Port
Recreation	Recreation	Leisure beach Parks and gardens Wildlife watching Leisure sailing Town

Table 12-14: Seascape Characterisation – sea surface

Broad Character Types	Character Types	Character Sub-Types
Coastal Infrastructure	Flood and erosion defences	Sea defence
Fishing	Fishing	Fixed netting Drift netting Pelagic trawling
Industry	Shipping industry	Commercial shipping route
	Energy industry	Renewable energy installation (wind)
Military	Military facility	Military practice area
Navigation	Navigation activity	Navigation route Anchorage

Broad Character Types	Character Types	Character Sub-Types
	Maritime safety	Buoyage Safety area
	Navigation hazard	Hazardous water Water turbulence
Ports and docks	Ports and docks	Harbour
Recreation	Recreation	Wildlife watching

Table 12-15: Seascape Characterisation – water column

Broad Character Types	Character Types	Character Sub-Types
Coastal Infrastructure	Flood and erosion defences	Sea defence
Fishing	Fishing	Bottom trawling Drift netting Fixed netting Pelagic trawling
Industry	Shipping industry	Commercial shipping
	Energy industry	Renewable energy installation (wind farm)
Military	Military facilities	Military practice area
Navigation	Navigation activity	Navigation route Anchorage
	Maritime safety	Buoyage Safety area
	Navigation hazard	Hazardous water Water turbulence

Table 12-16: Seascape Characterisation – sea floor

Broad Character Types	Character Types	Character Sub-Types
Communications	Telecommunications	Submarine telecommunications cable
Cultural topography	Cultural topography (marine)	Coarse sediment plains Fine sediment plains
	Palaeolandscapes component	Palaeochannel
Industry	Energy industry	Submarine power cable Renewable energy installation (wind farm)
Fishing	Fishing	Fixed netting Bottom trawling
Military	Military facility	Military practice area
Navigation	Navigation hazard	Maritime debris Wreck hazard

Table 12-17: Seascape Characterisation – sub-sea floor

Broad Character Types	Character Types	Character Sub-Types
Cultural topography	Cultural topography (marine)	Coarse sediment plains Fine sediment plains Mixed sediment plains Exposed bedrock
	Palaeolandscape component	Palaeolandscape component Palaeochannel
Industry	Processing industry	Spoil and waste dumping
	Energy industry	Submarine power cable Renewable energy installation (wind farm)
Navigation	Navigation hazard	Shoals and flats

12.4.4.1 Value

The local seascape characters located around and within the Marine Scheme are considered to be of **medium** archaeological value due to the areas' important and prolonged maritime history and its continued use today.

12.5 Environmental Appraisal and Mitigation

12.5.1 High-level Environmental Appraisal

Archaeological assets relating to seabed prehistory, maritime and aviation archaeology have been identified within the Marine Scheme, as has the potential for further assets to be discovered. The proposed project has the potential to physically and adversely impact known and potential archaeological receptors within the installation footprint and area of effect of indirect physical effects such as changes in seabed sediment regimes, scour etc.

Typically, adequate and appropriate mitigation is required to ensure that the archaeological value of the baseline within this report is maintained. Project Specific Mitigation is set out below.

12.5.2 Project Specific Mitigation

12.5.2.1 Avoidance

The primary mitigation for the protection of known archaeological assets is avoidance. This is achieved through the implementation and monitoring of Archaeological Exclusion Zones (AEZs), which are proposed for identified high value seabed features of anthropogenic origin (i.e. A1 classified geophysical anomalies).

The mitigation will establish appropriately sized AEZs around assets which have been considered to be of high archaeological potential, in consultation with the Archaeological Curators. 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.

12.5.2.2 Reduction

Reduction of impact can be achieved by means of appropriate mitigation identified through potential opportunities for further investigation of assets (e.g. during pre-installation surveys which may include visual survey methods and UXO assessment). Further investigations 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 assets 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 Written Scheme of Investigation (WSI) which includes a Protocol for Archaeological Discoveries.

12.5.2.3 Remedying and Offsetting

In cases where avoidance is either inappropriate or impossible, the damage to archaeological assets should be offset. In the case of seabed prehistoric features, 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. Recovery of artefacts and/or other archaeological assets 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. Recovery methods are identified through the WSI. Due to the vast differences in practice and implementation between these methods, each will be covered by a specific Method Statement, approved by the Archaeological Curator, should they be implemented.

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12.7 Acronyms and Abbreviations

Abbreviation	Definition
AD	<i>Anno Domini</i>
AEZ	Archaeological Exclusion Zone
AMAA	Ancient Monuments and Archaeological Areas Act 1979
BCE	Before Common Era
BP	Before Present
BGS	British Geological Survey
BULSI	Build, Use, Loss, Survival and Investigation
CIfA	Chartered Institute for Archaeologists
DECC	Department of Energy and Climate Change
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
ES	Environment Statement
ETRS	European Terrestrial Reference System
GIS	Geographic Information System
HE	Historic England
HER	Historic Environment Record
HES	Historic Environment Scotland
HSC	Historic Seascape Characterisation
JNAPC	Joint Nautical Archaeology Policy Committee
LGM	Last Glacial Maximum
Mag.	Magnetometer
MBES	Multibeam Echosounder
MCAA	Marine and Coastal Access Act 2009
MHWS	Mean High Water Spring
MMO	Marine Management Organisation
MPS	Marine Policy Statement
MSA	Merchant Shipping Act 1995
MS-LOT	Marine Scotland Licensing Organisation Team
nT	nanotesla
NM	Nautical Mile
NPPF	National Planning Policy Framework
NRHE	National Record of the Historic Environment
PMRA	Protection of Military Remains Act 1986
PWA	Protection of Wrecks Act 1973

Abbreviation	Definition
SBP	Sub-bottom Profiler
SSS	Sidescan Sonar
UKHO	United Kingdom Hydrographic Office
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UTM	Universal Transverse Mercator
WGS	World Geodetic System
WSI	Written Scheme of Investigation

Appendix A Chronology

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

Period	Date Range
Palaeolithic	c. 970,000–9500 BC
Early Post-glacial	9500–8500 BC
Mesolithic	8500–4000 BC
Neolithic	4000–2400 BC
Bronze Age	2400–700 BC
Iron Age	700 BC–AD 43
Romano-British	AD 43–410
Saxon	AD 410–1066
Medieval	AD 1066–1500
Post-medieval	AD 1500–1800
19th century	AD 1800–1899
Modern	1900–present day

The geological periods and associated Marine Isotope Stages are defined by the following date ranges:

Period	Date Range	MIS
Holocene	11,700 – present day	1
Devensian	115,000 – 11,700 BP	5d - 2
Ipswichian	130,000 – 115,000 BP	5e
Saalian	374,000 – 130,000 BP	10 - 6

Period	Date Range	MIS
Hoxnian	424,000 – 374,000 BP	11
Anglian	478,000 – 424,000 BP	12
Pre-Anglian	>478,000 BP	>12

Appendix B Palaeogeographic features of archaeological potential

ID	Classification	Archaeological Discrimination	Depth Range		Description	Data Type	Nearest KP	Distance to MIC (m)
			From	To				
7900	Acoustic blanking	P2	3.6	3.9	A possible area of acoustic blanking identified within the interpreted Largo Bay member of the Forth Formation. Feature is seen to disrupt the surrounding horizons and is beneath a possible pockmark at the seabed suggesting either a possible gas or fluid escape feature. Not definitively of palaeoenvironmental or archaeological interest; however, appears anomalous to surroundings and presence of shallow gas may indicate the microbial breakdown of organic matter. As such the feature has been retained as a precaution.	AUV Chirp	13	75.408692
7901	Cut and fill	P2	0.5	3.3	A small possible cut and fill with a relatively distinct basal reflector and possibly some internal horizontal reflectors which may indicate fine-grained fill. Feature cuts into an acoustically quiet unit which appears to be infilling an old channel cut, which may represent Wee Bankie or the St Abbs Formation infilling an older channel cutting into the surface of the bedrock. May be an internal feature; however, has the potential of being remnant of a fluvial feature.	AUV Chirp	76	94.798154
7902	Dune features	P1	0.8	7.0	Mounded features identified at the base of the interpreted St Andrews Bay member of the Forth Formation, above the Largo Bay member. Features appear generally acoustically quiet with some evidence of cross cutting. May represent coastal dune or other similar terrestrial feature. Possibly indicative of terrestrial land formations, however, may also be subaqueous in formation.	AUV Chirp	127	0
7903	Fine-grained deposit	P2	5.5	10.5	Possible fine grained deposit identified within St Andrews Bay member of the Forth Formation. Characterised by numerous parallel reflectors suggesting fine-grained deposits. No clearly discernible basal reflector. Slightly higher amplitude compared to surrounding sediments which may suggest some organic content, although this cannot be confirmed without further investigation.	AUV Chirp	142	278.455502
7904	High amplitude reflector	P2	2.0	3.5	A slightly high amplitude, acoustically chaotic feature within the interpreted St Andrews Bay member of the Forth Formation. Feature may represent a pocket of shallow gas caused by the microbial breakdown of organic material; however, there is no obvious associated acoustic blanking which is typically associated with gas and, as such, the feature is less certain.	AUV Chirp	145	135.786237
7905	Infilled depression	P2	0.1	2.2	A possible infilled depression identified in the top of bedrock. Feature has a distinct basal reflector and generally acoustically unstructured fill with some slightly higher amplitude	AUV Chirp	170	30.019377

ID	Classification	Archaeological Discrimination	Depth Range		Description	Data Type	Nearest KP	Distance to MIC (m)
			From	To				
					internal reflectors. Feature may be infilled with modern sand and not of archaeological or palaeoenvironmental interest; however this appears similar in form to feature 7906 which was seen in in the geophysical data to contain some sediments of possible interest and has therefore been retained as a precaution.			
7906	Infilled depression	P2	0.2	5.1	A broad possible channel feature or infilled depression identified cutting into the interpreted bedrock. Unit fill varies between within the feature. In the WSW it is characterised by numerous parallel reflectors which are generally seen to be horizontal, indicating fine grained sediments which may have been deposited in a low-energy environment, although are occasionally seen to be sub-horizontal and cross-cutting indicating different phases of fill. Towards the ENE the fill appears more unstructured, although a number of distinct, parallel, horizontal reflectors are identified which appear relatively high amplitude in comparison to surrounding sediments (7907-10). A possible later phase of cut and fill is also identified towards the north-east of the feature (7911). In the central section the feature shoals and appears less convincing, although it has been grouped as one due to no clear boundaries between the different areas of sediment. The basal reflector is generally distinct however it appears occasionally irregular with possible areas of acoustic blanking either at the base of the feature or within the feature itself, which is indicative of shallow gas which may have been produced by the breakdown of organic matter. The basal reflector is occasionally obscured by possible gas and, as such, the boundaries of the feature are not always clearly discernible. This feature is located in the nearshore area and may possibly represent modern intertidal deposits. However, the possible gas within the feature suggests that the feature contains sediments of palaeoenvironmental interest and therefore it has been retained as of potential interest.	Nearshore Parametric sonar and hull-mounted chirp	173	0
7907	Fine-grained deposit	P1	0.4	4.8	Distinct, relatively high-amplitude deposit characterised by numerous parallel, horizontal reflectors identified within a unit of generally acoustically unstructured sediments which may represent fluvial sediments or an infilled depression. Feature appears relatively high amplitude in comparison to surrounding sediments which may suggest that it contains some organic material which may be of palaeoenvironmental interest.	Nearshore Parametric sonar and hull-mounted chirp	174	182.427286
7908	Fine-grained deposit	P1	1.2	1.3	Small but distinct, relatively high-amplitude reflector characterised by several parallel, horizontal reflectors identified within a unit of generally acoustically unstructured sediments which may represent fluvial sediments or an infilled depression. Feature appears relatively high amplitude in comparison to surrounding sediments which may suggest that it contains some organic material which may be of palaeoenvironmental interest.	Nearshore Parametric sonar	174	13.199534

ID	Classification	Archaeological Discrimination	Depth Range		Description	Data Type	Nearest KP	Distance to MIC (m)
			From	To				
7909	Fine-grained deposit	P1	1.4	1.6	Small but distinct, relatively high-amplitude reflector characterised by several parallel, horizontal reflectors identified within a unit of generally acoustically unstructured sediments which may represent fluvial sediments or an infilled depression. Feature appears relatively high amplitude in comparison to surrounding sediments which may suggest that it contains some organic material which may be of palaeoenvironmental interest.	Nearshore Parametric sonar	174	34.844703
7910	Fine-grained deposit	P1	1.2	1.3	Small but distinct, relatively high-amplitude reflector characterised by a couple of parallel, horizontal reflectors identified within a unit of generally acoustically unstructured sediments which may represent fluvial sediments or an infilled depression. Feature appears relatively high amplitude in comparison to surrounding sediments which may suggest that it contains some organic material which may be of palaeoenvironmental interest.	Nearshore Parametric sonar	174	267.172563
7911	Cut and fill	P2	0.1	1.1	A possible shallow cut and fill feature identified either directly BSB or beneath a veneer or modern marine sediments. Feature is seen to be cutting into possible channel feature 7906 and may represent a later phase of fill, or a reactivation of an older channel feature. Unit fill appears relatively acoustically chaotic.	Nearshore Parametric sonar	174	110.936704

Appendix C Known shipwrecks and obstructions on the seabed within the ASA

ID	Other References	Easting	Northing	Name	Type	Description	Nearest KP	Distance to MIC (m)
2002	UKHO_63946 CANMORE_323974	557841.73	6201141.46	Unknown	Fishing vessel	Intact, upright, bows WSW	20	Within Corridor
2003	UKHO_4496 CANMORE_322988	566665.32	6198528.46	<i>Baron Stjenblad</i>	Steam ship	Intact, upright, bows SW, hold visible, stern possibly missing	30	133.882644
2005	UKHO_4462 NRHE_1609025 CANMORE_322960	593634.64	6174160.67	<i>Gudveig</i>	Steam ship	Norwegian cargo vessel which foundered on 25.01.1940, 5 miles ENE of Longstone lighthouse after being torpedoed on her passage from Newcastle-upon-Tyne to Bergen with coal. Built in 1919, the ship was a steel screw steamer. No remains were discovered in this location during a survey in 2002. Marked as DEAD by UKHO	68	202.592604
2006	UKHO_57998 NRHE_1380734 CANMORE_323729	601576.65	6156838.83	<i>Lunesdale</i> (possibly)	Steam ship	English cargo vessel which foundered on 12.03.1929, 7 miles SE of the Longstone following a collision on her passage from Sunderland to Banff with coal. Built in 1908, she was a steel screw steamer	90	171.678521
2008	UKHO_57013	615557.04	6107102.97	Unknown	Unknown	Unknown	143	208.537199
2009	UKHO_4547	616968.73	6103752.51	<i>Lagan Lomea</i>	Fishing vessel	Marked as DEAD by UKHO. Lost on 06.08.1991	146	105.070126
2012	UKHO_5720 NRHE_1002332	617685.12	6089330.85	<i>Zeeland</i> (possibly)	Steam ship	This steamship was stopped by the German submarine UB-39 on 01.08.1916. The crew were forced to abandon ship, after which the ship was sunk by gunfire	160	244.16994
2013	UKHO_64121	616443.62	6087029.09	<i>Blue Dawn</i>	Fishing vessel	Ex-Navy pinnace, cause of loss not stated. Lost on 13.02.2004	163	157.134545

ID	Other References	Easting	Northing	Name	Type	Description	Nearest KP	Distance to MIC (m)
2015	UKHO_5769	614460.92	6085308.09	Jenny M (possibly)	Fishing vessel	Small fishing vessel. Lost on 06.09.1983	165	232.820984
2018	UKHO_57777 NRHE_1313618	606933.23	6080112.89	Norman	Steam ship	Driven onto rocks. English cargo vessel lost on 10.06.1881. Marked as DEAD by UKHO.	175	179.057811

Appendix D Seabed features of archaeological potential

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7000	Dark reflector	538384	6201357	A2	2.8	2.3	0.8	-	Identified in the SSS dataset as an elongate, angular dark reflector with a short, bright shadow. More angular than other features nearby and located amongst boulders and outcrop. Visible on the MBES dataset as a sub-rounded mound with steep sides and a domed top, with no clear scour. Located in an area of boulders and bedrock outcrop, however appears unusually regular in form. No corresponding Mag. contacts. Interpreted as a possible natural feature or non-ferrous debris.	-	1	Within Corridor
7001	Magnetic	538530	6201417	A2	-	-	-	14	Identified in the Mag. dataset as a small, broad positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	1	Within Corridor
7002	Dark reflector	538523	6201302	A2	2.6	2.4	0.6	-	Identified in the SSS dataset as a slightly angular dark reflector with a slightly asymmetric flared shadow. Visible on the MBES dataset as a rounded mound with an uneven top and evenly sloping sides. There are some uneven areas around the base of the mound which seem unusual. There is some encircling scour extending for 2.5 m and 0.3 m deep. It is located in an area of boulders, but is more distinct than the surrounding features. No corresponding Mag. contacts. Interpreted as a possible natural feature or non-ferrous debris.	-	1	Within Corridor
7003	Seabed disturbance	538671	6201109	A2	5.3	3.7	0.7	-	Identified in the SSS dataset as a cluster of dark reflectors with shadows of varying height (generally approximately 0.2 m), which is relatively isolated. Also visible on the MBES dataset as a cluster of small mounds within a depression. No corresponding Mag. contacts. Interpreted as a possible natural feature or non-ferrous debris.	-	1	Within Corridor
7004	Magnetic	538745	6201298	A2	-	-	-	14	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	1	Within Corridor
7005	Magnetic	538862	6201332	A2	-	-	-	36	Identified in the Mag. dataset as a small symmetric dipole with peak and trough over two profile lines. Also visible on other profile lines. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	1	Within Corridor
7006	Magnetic	539125	6201246	A2	-	-	-	12	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	1	Within Corridor
7007	Magnetic	539136	6201216	A2	-	-	-	19	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	1	Within Corridor
7008	Magnetic	539431	6201348	A2	-	-	-	15	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7009	Magnetic	539481	6201284	A2	-	-	-	31	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	2	Within Corridor
7010	Magnetic	539511	6201222	A2	-	-	-	129	Identified in the Mag. dataset as a large negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	2	Within Corridor
7011	Magnetic	539531	6201218	A2	-	-	-	21	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	2	Within Corridor

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7012	Magnetic	539576	6201353	A2	-	-	-	18	Identified in the Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7013	Magnetic	539576	6201301	A2	-	-	-	19	Identified in the Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7014	Magnetic	539666	6201236	A2	-	-	-	16	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7015	Magnetic	539718	6201103	A2	-	-	-	33	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	2	Within Corridor
7016	Debris	539723	6201023	A2	8.5	5.5	0.5	116	Identified in the SSS dataset as an area of bright reflectors representing a possible depression, containing a very highly reflective object in the centre measuring approximately 0.9 x 0.5 m and a very indistinct possible dark reflector on the southern edge. Associated with a large, sharp asymmetric dipole with peak and trough on one profile line on the Mag. dataset. Visible on the MBES dataset as a small mound with some minor scour. Interpreted as possible ferrous debris.	-	2	Within Corridor
7017	Magnetic	539819	6201084	A2	-	-	-	12	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7018	Magnetic	539833	6201136	A2	-	-	-	16	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7019	Mound	539897	6201344	A2	4.6	3.9	1.5	-	Identified on the MBES dataset as a slightly irregular rounded mound with steeply sloping sides and a domed top. Some encircling scour extending 1.5 m and 0.1 m deep. Located in a boulder field and appears unusually large. Also visible in the SSS dataset as a large, rounded dark reflector with a short shadow. No corresponding Mag. contacts. Interpreted as a possible natural feature or non-ferrous debris.	-	2	51.964625
7020	Magnetic	540207	6200856	A2	-	-	-	17	Identified in the Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression and retained as a precaution.	-	2	Within Corridor
7021	Debris	540162	6200949	A2	1.3	0.6	0.4	31	Identified in the SSS dataset as a small, angular dark reflector with a short shadow. Isolated and more angular than other features. Associated with a small positive monopole with peak and trough on one profile line on the Mag. dataset. No corresponding MBES contacts. Interpreted as a possible ferrous debris.	-	2	Within Corridor
7022	Magnetic	540159	6201000	A2	-	-	-	9	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	2	Within Corridor
7023	Magnetic	540244	6201034	A2	-	-	-	24	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	2	Within Corridor
7024	Magnetic	540278	6201006	A2	-	-	-	25	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7025	Magnetic	540358	6200999	A2	-	-	-	19	Identified in the Mag. dataset as a small symmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	3	Within Corridor
7026	Magnetic	540336	6201140	A2	-	-	-	30	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a	-	3	Within Corridor

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									possible ferrous debris either buried or with no surface expression. Retained as a precaution.			
7027	Magnetic	540267	6201198	A2	-	-	-	47	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7028	Magnetic	540300	6201201	A2	-	-	-	34	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	2	Within Corridor
7029	Magnetic	540389	6201266	A2	-	-	-	370	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	3	Within Corridor
7030	Magnetic	540565	6200953	A2	-	-	-	38	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	3	Within Corridor
7031	Magnetic	540485	6201184	A2	-	-	-	33	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	3	Within Corridor
7032	Magnetic	540505	6201186	A2	-	-	-	39	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression. Retained as a precaution.	-	3	Within Corridor
7033	Dark reflector	540560	6201240	A2	2.7	1.8	1.1	-	Identified in the SSS dataset as a narrow, rectangular dark reflector with a bright, rounded shadow. More elongate than other nearby features. Two dark reflectors with shadows are visible within 4 m which are interpreted as boulders. Two additional short linear dark reflectors with slight shadow are also visible nearby which may be natural seabed megaripples. Visible on the MBES dataset as a slightly irregular mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or non-ferrous debris.	-	3	Within Corridor
7034	Magnetic	540636	6201290	A2	-	-	-	67	Identified in the Mag. dataset as a medium, sharp positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	3	Within Corridor
7035	Magnetic	541019	6200940	A2	-	-	-	182	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	3	Within Corridor
7036	Debris	542330	6201490	A2	3.3	2.9	1.4	-	Identified in the SSS dataset as a large, rounded dark reflector with a bright, long, tapered shadow. Larger than surrounding features. Visible on the MBES dataset as a rounded mound with evenly sloping sides and a level top. This is unusually large in an area of boulders. No visible scour. No corresponding Mag. contacts. Interpreted as possible debris.	-	5	17.975164
7037	Dark reflector	542320	6200961	A2	1.9	0.8	0.5	-	Identified in the SSS dataset as a square dark reflector with a double-peaked shadow. Appears slightly more angular than surrounding likely natural features. Visible on the MBES dataset as a rounded, slightly irregular mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or non-ferrous debris. This is located within 4 m of 7038 and may possibly be associated.	-	4	7.35513
7038	Rope/chain	542332	6200964	A2	16.8	0.3	0.2	-	Identified in the SSS dataset as a long, straight, narrow dark reflector with a short shadow which is wider, higher and more irregular at the western end. No corresponding MBES or Mag. contacts. Interpreted as a possible length of rope or chain. This is located within 4 m of 7037 and may possibly be associated.	-	4	5.573694
7039	Seabed disturbance	542812	6201181	A2	5.2	4.4	0.1	-	Identified on the MBES dataset as a five small mounds equally spaced in a triangular formation. The largest measures 1.1 x 0.9 x 0.1 m. They are approximately 1.5 m	-	5	Within Corridor

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									apart on two sides, and 3.6 m on the third side. No scour visible. The mounds themselves do not appear unusual, however the formation does and so the feature has been tagged as a precaution. No corresponding SSS contacts. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or non-ferrous debris.			
7040	Dark reflector	542913	6201491	A2	2.0	1.2	0.3	-	Identified in the SSS dataset as an angular dark reflector with a slightly irregular triangular shadow. Slightly higher reflectivity at one end. Visible on the MBES dataset as a low, elongate mound. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or non-ferrous debris.	-	5	Within Corridor
7041	Seabed disturbance	543244	6201254	A2	6.9	1.8	0.4	-	Identified in the SSS dataset as a linear alignment of approximately five dark reflectors with tapered shadows in an approximate NW-SE alignment. Adjacent to one end of 7042 and possible attached. Visible on the MBES dataset as a cluster of small, low, rounded mounds within a broader depression. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or non-ferrous debris.	-	5	Within Corridor
7042	Rope/chain	543253	6201244	A2	23.4	0.3	0.1	-	Identified in the SSS dataset as a long, curvilinear dark reflector extending approximately south-west from 7041, with 7043 at its centre. At the south-east end, a possible very indistinct dark reflector is visible. Possibly part of a wider seabed disturbance. No corresponding MBES contacts. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible length of rope or chain.	-	5	Within Corridor
7043	Dark reflector	543256	6201242	A2	1.2	1.2	0.2	-	Identified in the SSS dataset as a small, round dark reflector with a tapered shadow, possible attached to 7042. Visible on the MBES dataset as a small rounded mound within scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. May be a rock with snagged rope/chain or may be attached debris.	-	5	Within Corridor
7044	Mound	543546	6201177	A2	3.7	2.7	0.3	-	Identified on the MBES dataset as a rounded mound with an uneven top and evenly sloped sides. There is no clear scour. Located in an area of featureless seabed and appears unusual. No corresponding SSS contacts. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris. This is one of three seabed features that appear similar and may be related: 7045 is 20 m to the south-east, 7046 is 67 m to the south-east.	-	6	Within Corridor
7045	Mound	543567	6201167	A2	5.1	2.2	0.3	-	Identified on the MBES dataset as a sub-rounded mound with an uneven top and evenly sloped sides. There is no clear scour. Located in an area of featureless seabed and appears unusual. No corresponding SSS contacts. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris. This is one of three seabed features that appear similar and may be related: 7044 is 20 m to the north-west, 7046 is 45 m to the south-east.	-	6	Within Corridor
7046	Mound	543606	6201141	A2	3.6	2.4	0.3	-	Identified on the MBES dataset as a low series of irregular mounds with the largest measuring 1.7 x 0.8 x 0.3 m. There is no clear scour. Located in an area of featureless seabed and appears unusual. No corresponding SSS contacts. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris. This is one of three seabed features that appear similar and may be related: 7044 is 67 m to the north-west, 7045 is 45 m to the north-west.	-	6	5.022622
7047	Dark reflector	543607	6201250	A2	4.2	1.0	0.3	-	Identified in the SSS dataset as a square dark reflector with a tapered shadow and possibly a slight depression on the near side. Higher reflectivity than surrounding boulders and more angular. Visible on the MBES dataset as a small, slightly elongate mound. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	6	Within Corridor

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7048	Dark reflector	544344	6201506	A2	3.2	1.3	0.7	-	Identified in the SSS dataset as a sub-rounded dark reflector with broad, straight-sided shadow with a sloped top, distinct from the surrounding seabed. Visible in the MBES dataset as a small but prominent mound. No corresponding Mag. contact. Interpreted as a possible natural feature or debris.	-	7	Within Corridor
7049	Dark reflector	544927	6201292	A2	4.1	0.5	0.2	-	Identified in the SSS dataset as an elongate, narrow dark reflector with a very short, indistinct shadow. . This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. No corresponding MBES coverage. Interpreted as a natural feature or possible associated wreck debris. This is located approximately 6 m north of wreck 7051 and within the associated area of scour.	-	7	49.711075
7050	Debris	544918	6201285	A1	3.9	1.5	0.3	-	Identified in the SSS dataset as an irregular, sub-rounded, elongate dark reflector orientated approximately north-west to south-east, with indistinct boundaries and faint round-ended shadow, situated within scour of wreck 7051. No corresponding MBES coverage and not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible debris associated with wreck 7051. This is located outside the study area, however an AEZ will bring it within the area.	-	7	55.313069
7051	Wreck	544938	6201279	A1	49.8	13.5	0.9	-	Identified in the SSS dataset as a cluster of irregular and rounded dark reflectors, possibly representing collapsed superstructures, within a thin, elliptical outline or edge with varying height, which may represent a hull outline. Located within a wide boulder field, making identification of surrounding debris objects difficult. This feature was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. No corresponding MBES coverage. This is the likely position of UKHO 95243, the wreck of an unknown vessel which was first located in 2020 with recorded dimensions of 48 x 9 m at a general depth of 38.5 m.	UKHO 95243, WA 2001	7	64.185912
7052	Dark reflector	545418	6201545	A2	3.1	1.5	1.2	-	Identified in the SSS dataset as an angular, elongate dark reflector with shadow, slightly tapering towards the southern extent, distinct from the surrounding seabed. Visible on the MBES dataset as an angular mound with evenly sloped sides and a rounded top. Some slight scour extending for 2.2 m east and 0.1 m deep. Located in an area of boulders and form appears unusual. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	8	Within Corridor
7053	Dark reflector	545552	6201481	A2	2.9	1.4	1.1	-	Identified in the SSS dataset as an elongate dark reflector with long tapered shadow, distinct from the surrounding seabed, with possible other additional dark reflectors adjacent. Visible on the MBES dataset as a small area of mounds that appears angular and unusually complex. The largest appears to measure 1.5 x 0.9 x 0.3 m. There is some slight scour extending to the east for 1.5 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	8	Within Corridor
7054	Magnetic	549809	6201958	A2	-	-	-	9	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough over two profile lines. No corresponding MBES or SSS contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	12	Within Corridor
7055	Dark reflector	550788	6201846	A2	3.8	2.1	0.7	-	Identified in the SSS dataset as an irregular dark reflector with indistinct boundaries, small scour and narrow shadow, situated within region of featureless seabed. Visible on the MBES dataset as an elongate mound with evenly sloping sides and a rounded top. There appears to be a slight curve to either end and a slightly flared associated scour extending a maximum of 4.2 m and 0.3 m deep. Isolated in an area of featureless seabed. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	13	Within Corridor
7056	Dark reflector	553586	6201638	A2	2.4	1.5	0.7	-	Identified in the SSS dataset as a small, sub-rounded dark reflector with irregular sub-angular shadow, distinct from the surrounding seabed. Visible on the MBES dataset as a prominent mound. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	16	Within Corridor

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7057	Mound	554855	6201573	A2	2.5	2.5	0.5	-	Identified in the MBES dataset as a rounded mound with unevenly sloping sides and a rounded top. There are three smaller sub-rounded mounds immediately adjacent to the north, south, and east that may be related. Encircling scour extending for 4.3 m and 0.2 m deep. Appears isolated in an area of clear scour. Tentatively observed in the SSS dataset as a slightly irregular dark reflector with shadow. No corresponding Mag. contacts. Interpreted as a possible natural feature or debris. Retained as a precaution.	-	17	Within Corridor
7058	Dark reflector	555356	6201751	A2	3.0	1.2	0.3	-	Identified in the SSS dataset as a small, sub-rounded dark reflector with indistinct boundaries and irregular flared shadow, within a region of relatively featureless seabed. One large linear scar-like feature nearby, trending east-west, however this is not thought to be related. Visible on the MBES dataset as an irregular depression with a possible mound in the centre. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	18	Within Corridor
7059	Dark reflector	557312	6201639	A2	2.7	1.2	0.8	-	Identified in the SSS dataset as a rounded dark reflector with indistinct boundaries, small scour and a narrow tapered shadow, situated in a featureless region of seabed. Visible on the MBES dataset as a small mound in scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris. retained as a precaution.	-	20	Within Corridor
7060	Seabed disturbance	557778	6201563	A2	40.8	16.8	0.4	-	Identified in the SSS dataset as an area of sub-rounded dark reflectors with broad rounded shadows, distinct from the surrounding seabed; similar cluster of smaller sub-rounded dark reflectors approximately 28m to the NE, and long curvilinear scar-like feature approximately 15m to the SW, running WNW-ESE. Visible on the MBES dataset as an area of irregular seabed with some irregularly shaped mounds. There are two more distinct areas to the north-east and south-west, with some slight, less distinct mounds in between. The south-west area is approximately 8.7 x 8.2 m, with the largest mound here measuring 3.1 x 1.7 x 0.4 m. The area to the north-west is 20.3 x 17.7 m with the largest individual mound measuring 4.3 x 2.9 x 0.2 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Possible natural feature, but could be partially buried debris.	-	20	Within Corridor
7061	Dark reflector	558368	6201126	A2	1.8	1.3	0.4	-	Identified in the SSS dataset as a small, indistinct dark reflector with an angular, bright shadow, distinct from otherwise featureless seabed. Visible on the MBES dataset as a broad mound with scour on the southern edge. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris. Retained as a precaution.	-	21	Within Corridor
7062	Seabed disturbance	559076	6201297	A2	6.8	6.0	0.8	-	Identified in the SSS dataset as an irregular area of sub-angular dark reflectors with shadows, distinct from relatively featureless seabed. Visible on the MBES dataset as an irregular rounded mound with uneven sides and a pointed top. There is some scour to the south-west extending 8.0 m and 0.1 m deep. Located in an area of featureless seabed. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	21	Within Corridor
7063	Dark reflector	559040	6201040	A2	3.3	2.0	0.6	-	Identified in the SSS dataset as a small, sub-rounded dark reflector with bright patch in the centre, and a very distinct round-ended shadow. Distinct from an otherwise featureless area of seabed. Visible on the MBES dataset as an elongate mound with an uneven top and evenly sloping sides. There is some encircling scour extending for 2.2 m and 0.2 m deep. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	21	Within Corridor
7064	Rope/chain	560079	6200753	A2	79.0	1.3	0.2	-	Identified in the SSS dataset as a long narrow curvilinear dark reflector with very short shadow, distinct from otherwise featureless seabed. Some scour/sediment build-up is visible along the western section. No corresponding MBES coverage and not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Possibly a modern feature such as fishing	-	22	93.270655

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									gear and therefore may not be of archaeological interest. However, as this cannot be confirmed without further investigation, the feature has been retained as a precaution.			
7065	Seabed disturbance	560710	6200774	A2	15.4	3.5	0.6	-	Identified in the SSS dataset as an irregular area of sub-angular dark and bright reflectors with scour and tapered shadows, distinct from an otherwise featureless seabed. A small, linear dark reflector possibly extends from the feature. Visible on the MBES dataset as an elongate area of irregular seabed. There is a central irregularly mounded area with one high point measuring 9.9 x 3.5 x 0.3 m. It is on an approximate east to west alignment, and located within an area of possible depression or scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	23	Within Corridor
7066	Dark reflector	561596	6200882	A2	2.1	1.8	0.6	-	Identified in the SSS dataset as a small, sub-angular, elongate dark reflector with broad angular shadow, distinct from the surrounding seabed. Visible in the MBES dataset as an irregular mound in scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or debris.	-	24	Within Corridor
7067	Rope/chain	563000	6200812	A2	13.5	3.0	0.4	-	Identified in the SSS dataset as an irregular curvilinear dark reflector with indistinct boundaries and scour along its length, with a small sub-rounded dark reflector (approximately 2m x 1m) at the north-west end with a narrow tapered shadow. No corresponding MBES contacts. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible length of rope or chain.	-	25	Within Corridor
7068	Magnetic	565507	6199596	A2	-	-	-	773	Identified in the Mag. dataset as a very large asymmetric dipole with peak and trough on one profile line. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	28	Within Corridor
7069	Debris field	566993	6198990	A2	14.1	12.1	1.2	-	Identified in the SSS dataset as a cluster of irregular dark reflectors, possibly four objects or two elongate objects, with highly irregular shadows. Highly anomalous compared with surrounding features. No corresponding MBES coverage and not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible debris field.	-	30	Within Corridor
7070	Magnetic	569530	6195659	A2	-	-	-	448	Identified in the Mag. dataset as a large, sharp positive monopole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	34	Within Corridor
7071	Magnetic	569888	6194919	A2	-	-	-	14	Identified in the Mag. dataset as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as a possible ferrous debris either buried or with no surface expression.	-	35	Within Corridor
7072	Debris	570231	6193682	A2	5.9	1.2	0.3	-	Identified in the SSS dataset as a short, straight, linear dark reflector with a slightly irregular shadow. No corresponding MBES coverage and not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible debris.	-	36	Within Corridor
7073	Dark reflector	570805	6193139	A2	3.1	2.4	1.5	-	Identified in the SSS dataset as a distinct dark reflector with a bright, distinct shadow. Observed in the MBES dataset as an irregularly shaped mound with significant height and no clear scour. This feature is not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	37	Within Corridor
7074	Magnetic	570951	6192799	A2	-	-	-	957	Identified in the Mag. dataset as a very large, sharp positive monopole with peak and trough over two profile lines. No corresponding SSS or MBES contacts, however it is located in an area of irregular seabed as visible in the MBES dataset. Interpreted as possible ferrous debris either buried or with no surface expression.	-	37	Within Corridor
7075	Dark reflector	572076	6191086	A2	3.1	1.5	0.6	-	Identified in the SSS dataset as a small, slightly elongate, rounded dark reflector with a tapered shadow. Observed in the MBES dataset as an angular mound with scour extending north-west to south-east for a maximum of 4 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous	-	39	Within Corridor

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
									material is present at this location. Interpreted as a possible natural feature or possible debris.			
7076	Debris	572187	6190902	A2	3.5	1.1	0.7	-	Identified in the SSS dataset as a slightly elongate dark reflector with some possible structure and a short rounded shadow. Partially covered by the MBES dataset and visible as an elongate mound with some scour extending north-west for over 6 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as possible debris.	-	40	Within Corridor
7077	Magnetic	572011	6190678	A1	-	-	-	1219	Identified in the Mag. dataset as a very large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	40	Within Corridor
7078	Magnetic	572997	6188705	A2	-	-	-	10	Identified in the Mag. dataset as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	42	Within Corridor
7079	Magnetic	574171	6186349	A2	-	-	-	35	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	45	Within Corridor
7080	Dark reflector	574592	6185819	A2	2.9	2.2	0.6	-	Identified in the SSS dataset as an irregularly shaped dark reflector, possibly comprising multiple adjacent rounded objects, with an uneven shadow. Observed in the MBES dataset as three distinct sub-rounded mounds, the largest of which measures 2.2 x 1.8 x 0.3 m. These are within encircling scour that extends for approximately 2 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	45	Within Corridor
7081	Debris	574693	6185417	A2	4.3	2.0	1.0	-	Identified in the SSS dataset as a large, poorly defined dark reflector with a bright, broad shadow. Observed in the MBES dataset as a large sub-rounded mound with encircling scour extending predominantly to the south-east for a approximately 8 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as possible debris.	-	46	Within Corridor
7082	Seabed disturbance	574916	6185095	A2	16.0	14.8	0.3	-	Identified in SSS data as an irregular area of disturbed seabed comprised of bright reflectors and some possible dark reflectors. Observed in the MBES dataset as a large rounded mound with a smaller, elongate mound to the immediate north. Encircling scour is visible extending for a maximum of 2.6 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	46	Within Corridor
7083	Debris field	574828	6184575	A2	6.5	4.5	0.7	-	Identified in the SSS dataset as a small cluster of three or four rounded dark reflectors with clear shadows. Observed in the MBES dataset as three distinct mounds: the largest rounded mound to the north-east measuring 2.9 x 2.4 x 0.5 m, with the other two slightly more irregular in shape. They are located within encircling scour that extends predominantly to the south-east for 4.6 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible debris field.	-	46	Within Corridor

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7084	Dark reflector	576344	6182679	A2	10.4	0.6	0.4	-	Identified in the SSS dataset as a small, irregular feature consisting of a dark reflector with tapered shadow and scour, an adjacent small, bright reflector which may represent a depression, and a narrow linear dark reflector appearing to join the two. May represent multiple associated objects or one irregular feature. This location was not directly covered by either the MBES dataset or the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or debris.	-	49	43.984523
7085	Magnetic	577122	6182447	A2	-	-	-	21	Identified in the Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	50	Within Corridor
7086	Seabed disturbance	579982	6180708	A2	24.5	8.3	0.4	-	Identified in the SSS dataset as an elongate area of disturbed seabed comprised of poorly defined objects with height. Observed in the MBES dataset as an area of irregular, undulating seabed to the immediate east of a large gently sloping likely natural mound. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. May represent a natural feature or may represent possible partially buried debris.	-	53	Within Corridor
7087	Dark reflector	580048	6180522	A2	4.5	0.6	0.6	-	Identified in the SSS dataset as a slightly irregular dark reflector that appears to curve round slightly. Observed in the MBES dataset as a rounded mound with scour extending north-west to south-east for a maximum of 5.5 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	53	Within Corridor
7088	Dark reflector	580597	6180102	A2	4.9	1.3	1.0	-	Identified in the SSS dataset as an elongate dark reflector with two distinct short tapered shadows. This location was not directly covered by the MBES dataset or the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	54	27.860268
7089	Dark reflector	582061	6179685	A2	2.2	2.0	0.7	-	Identified in the SSS dataset as a slightly indistinct dark reflector with a short tapered shadow within some sediment disturbance. Observed in the MBES dataset as an oval mound with scour extending to the north-west and south-east for 9.0 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	55	Within Corridor
7090	Debris	583322	6179488	A2	4.8	4.1	2.6	-	Identified in the SSS dataset as a large, slightly irregular dark reflector with a bright, distinct shadow and significant height. Observed in the MBES dataset as a large irregular mound with encircling scour extending primarily to the south-east for 10.4 m. The feature has some sediment build-up to the north-west. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Approximately 12 m NNW from 7091 and may be related. Interpreted as possible debris.	-	57	Within Corridor
7091	Bright reflector	583324	6179475	A2	4.0	2.0	-	-	Identified in the SSS dataset as two adjacent parallel, short, linear bright reflectors and possibly represents two associated objects or one larger object. No corresponding MBES contact, however this is located within a small area of irregular seabed. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Approximately 12 m SSE from 7090 and may be related. Interpreted as a possible natural feature or possible debris.	-	57	Within Corridor

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7092	Magnetic	584015	6179357	A2	-	-	-	56	Identified in the Mag. dataset as a medium, asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression. Possibly related to 7093 as part of a larger, complex anomaly.	-	57	Within Corridor
7093	Magnetic	584010	6179360	A2	-	-	-	54	Identified in the Mag. dataset as a medium, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression. Possibly related to 7092 as part of a larger, complex anomaly.	-	57	Within Corridor
7094	Dark reflector	584199	6179421	A2	5.0	2.2	1.0	-	Identified in the SSS dataset as an elongate, slightly curved dark reflector with a clear, sloped shadow. Observed in the MBES dataset as a distinct round mound with encircling scour extending primarily to the south-east for 8.7 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	57	Within Corridor
7095	Debris field	588115	6176150	A1	45.4	17.3	1.1	-	Identified in the SSS dataset as an area of debris comprising large, wide, parallel linear features, as well as multiple angular dark reflectors with height within, and adjacent to, the main area of debris. Isolated in an otherwise featureless area of seabed. The feature is identified at the very edge of the sonar data and is only partially covered, therefore all measurements should be considered a minimum. Furthermore, it is likely that the central position given here does not represent that actual centre point of the feature. The feature is not covered by either the MBES data or the Mag. data and, as such, it is not possible to confirm the presence of ferrous material at this location. The feature is located approximately 18 m north-east of the UKHO position for the wreck of the steamship Maystone (possibly), which sank 18/10/1949 after a collision with an aircraft carrier, and is likely related. Interpreted as a debris field, likely representing, or related to, the wreck.	UKHO_4467, NRHE_1525637, CANMORE_322 965	62	193.239842
7096	Debris	588677	6175972	A2	7.3	6.2	0.6	-	Identified in the SSS dataset as a highly distinctive dark reflector comprising two straight, linear objects lying abutted to each other at an approximate right angle with a clear shadow. Observed in the MBES dataset as an irregular 'T-shaped' mound. There is sedimentation visible to the north and some slight scour at the east end extending north, and to the south. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as debris.	-	63	19.093348
7097	Rope/chain	590088	6175412	A2	142.3	0.4	0.1	-	Identified in the SSS dataset as a long, very narrow and slightly curved linear dark reflector with a very short shadow along its length. Observed in the MBES dataset as a linear mound on an approximate NNW to SSE alignment. There is no distinct scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or modern scar, although has the potential of being a length of rope/chain and has therefore been retained as a precaution.	-	65	Within Corridor
7098	Dark reflector	590937	6174448	A2	1.2	0.3	0.3	-	Identified in the SSS dataset as a small but distinct elongate dark reflector with a short shadow. Slightly curved but may be partially buried boulder. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	66	Within Corridor
7099	Magnetic	593464	6173866	A2	-	-	-	23	Identified in the Mag. dataset as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	68	Within Corridor

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7100	Mound	593868	6173770	A2	3.2	1.8	0.3	-	Identified in the MBES dataset as an irregular shaped mound with a prominent ridge to the west, south, and east. There is some slight scour visible to the south-east extending for 1.2 m. Observed in the SSS dataset as an irregularly shaped dark reflector with a bright shadow. It is located 18 m north-west of a Mag. anomaly, however this is interpreted as a natural feature and therefore it has not been grouped in. Interpreted as a possible natural feature or possible debris.	-	69	Within Corridor
7101	Dark reflector	595064	6173527	A2	4.5	1.9	0.8	-	Identified in the SSS dataset as a distinct, slightly angular dark reflector with a clear tapered shadow. Observed in the MBES dataset as an angular mound with no distinct scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	70	Within Corridor
7102	Debris field	595724	6173098	A2	18.4	15.1	0.9	-	Identified in the SSS dataset as a distinct area of small, rounded dark reflectors with shadows. Observed in the MBES dataset as an area of irregularly shaped mounds, with the largest at the east measuring 2.6 x 1.5 x 0.6 m. These mounds are more densely positioned to the north and east, and there is no distinctive associated scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible debris field.	-	71	Within Corridor
7103	Magnetic	596126	6173151	A1	-	-	-	1007	Identified in the Mag. dataset as a very large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	71	Within Corridor
7104	Magnetic	596648	6173012	A2	-	-	-	206	Identified in the Mag. dataset as a large positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	72	Within Corridor
7105	Bright reflector	598163	6172555	A2	5.0	2.2	0.0	-	Identified in the SSS dataset as an irregularly shaped bright reflector in a relatively isolated area of seabed. Observed in the MBES dataset as an oval mound with an uneven profile. Sedimentation is visible to the west and scour extends to the east for 1.5 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	73	Within Corridor
7106	Seabed disturbance	598371	6172323	A2	22.5	13.4	0.6	-	Identified in the SSS dataset as an elongate area of disturbed seabed comprised poorly defined objects with slight height. Observed in the MBES dataset as an elongate mound with distinct edges at the south end and less clear to the north, possibly indicating partial burial. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. May represent a natural feature or possible partially buried debris. It is located approximately 4 m south-west of 7107 and may be related.	-	73	Within Corridor
7107	Mound	598381	6172332	A2	5.9	2.4	0.3	-	Identified in the MBES dataset as an elongate mound. Tentatively observed in the SSS dataset as an elongate bright reflector. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. May represent a natural feature or may represent possible partially buried debris. It is located approximately 4 m north-east of 7106 and may be related. Interpreted as a possible natural feature or may be possible debris.	-	73	Within Corridor
7108	Dark reflector	599837	6170908	A2	1.7	1.6	1.4	-	Identified in the SSS dataset as a small, angular dark reflector with a bright, tapered shadow. Observed in the MBES dataset as an angular mound with some scour to the north-west extending for 2.4 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	75	Within Corridor
7109	Magnetic	600123	6170614	A2	-	-	-	96	Identified in the Mag. dataset as a medium, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	76	Within Corridor

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7110	Magnetic	600135	6170569	A2	-	-	-	656	Identified in the Mag. dataset as a very large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression. Possibly related to 7111, located 11m south.	-	76	Within Corridor
7111	Magnetic	600138	6170558	A2	-	-	-	96	Identified in the Mag. dataset as a medium negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression. Possibly related to 7110, located 11m north.	-	76	Within Corridor
7112	Magnetic	600163	6170460	A2	-	-	-	608	Identified in the Mag. dataset as a very large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression. Possibly related to 7113 to the east and may therefore represent either a broad geological feature or an modern anthropogenic feature such as an uncharted pipeline. However, as this cannot be proven without further investigation, the feature has been retained as a precaution.	-	76	Within Corridor
7113	Magnetic	600240	6170468	A2	-	-	-	222	Identified in the Mag. dataset as a large asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression. Possibly related to 7112 to the west and may therefore represent either a broad geological feature or an modern anthropogenic feature such as an uncharted pipeline. However, as this cannot be proven without further investigation, the feature has been retained as a precaution.	-	76	Within Corridor
7114	Seabed disturbance	600203	6170209	A2	14.8	14.2	0.9	-	Identified in the SSS dataset as a small but distinct seabed disturbance comprising numerous small objects with height forming a mound. Observed in the MBES dataset as a rounded mound with smaller, less distinct mounds visible on the south and east sides of the feature. No corresponding Mag. anomaly. May represent a natural feature or may represent possible partially buried debris.	-	76	Within Corridor
7115	Dark reflector	600238	6166761	A2	2.3	0.5	0.6	-	Identified in the SSS dataset as a small, slightly elongate dark reflector with a relatively broad shadow. Observed in the MBES dataset as an angular mound. There is some scour visible to the south-east, extending for over 3 m. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	80	Within Corridor
7116	Magnetic	601115	6162073	A2	-	-	-	19	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. A small rounded mound measuring 1.7 x 1.6 x 0.2 m with some encircling scour extending 1.2 m, is visible in the MBES dataset located 3 m to the east, which coincides with a rounded dark reflector with a short shadow in the SSS, however it is not clear if this is associated with the magnetic anomaly or not. Interpreted as possible ferrous debris either buried or with no, or little, surface expression.	-	85	Within Corridor
7117	Magnetic	601194	6161315	A2	-	-	-	47	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	86	Within Corridor
7118	Debris	601520	6160937	A2	20.0	12.1	2.8	-	Identified in the SSS dataset as a very large object with complex, textured internal reflectors and a large tapered shadow. This location was not directly covered by the MBES dataset, and it was not covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Possibly represents an area of outcropping geology; however, based on the significant height and anomalous form, the feature has been interpreted as possible debris as a precaution.	-	86	204.165433

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7119	Seabed disturbance	601541	6160917	A2	82.4	43.5	0.5	-	Identified in the SSS dataset as a broad area of small dark reflectors with tapered shadows. This location was not directly covered by the MBES dataset, and it was not covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. This may be natural, however due to the proximity to 7118 to the north-west, this has been retained as a precaution. May represent a natural feature or may represent a possible debris field.	-	86	222.622662
7120	Dark reflector	601523	6160872	A2	5.5	3.4	0.9	-	Identified in the SSS dataset as a poorly defined, very indistinct dark reflector with a distinctive irregular shadow. This location was not directly covered by the MBES dataset, and it was not covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. This may be natural, however due to the proximity to 7118, located 50 m to the north, this has been retained as a precaution. May represent a natural feature or may represent possible debris.	-	86	199.369793
7121	Dark reflector	601519	6159329	A2	4.0	1.5	1.2	-	Identified in the SSS dataset as a slightly irregular dark reflector with a clear tapered shadow. Visible on the MBES dataset as a distinct rounded mound. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	88	10.853179
7122	Magnetic	601590	6158089	A2	-	-	-	626	Identified in the Mag. dataset as a very large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	89	0
7123	Dark reflector	602741	6153937	A2	4.4	1.0	0.4	-	Identified in the SSS dataset as an elongate dark reflector with a slightly irregular short shadow. This location was not directly covered by the MBES dataset or Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	93	12.311661
7124	Rope/chain	603145	6153510	A2	13.0	1.1	0.3	-	Identified in the SSS dataset as a faint, intermittent curvilinear dark reflector with a faint shadow. This feature is aligned perpendicular to large sand waves. Visible on the MBES dataset as a linear mound between two sand waves. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible length of rope or chain.	-	94	0
7125	Magnetic	603286	6150871	A2	-	-	-	30	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	96	0
7126	Mound	603041	6150842	A2	3.6	1.6	0.4	-	Identified in the MBES dataset as an elongate mound located in an area of sand ripples towards the edge of the survey area. No corresponding SSS contacts or Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	96	222.028029
7127	Dark reflector	603350	6149892	A2	3.6	2.2	1.6	-	Identified in the SSS dataset as a distinct, angular dark reflector with a distinct, tapered shadow, identified in an area of numerous small boulders. Very distinct and anomalous to its surroundings. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	97	0
7128	Dark reflector	603312	6149428	A2	5.5	1.1	0.6	-	Identified in the SSS dataset as a distinct, elongate dark reflector which appears to bend at an angle. This feature has a broad, distinct shadow and some associated scour. Identified in an area with frequent small objects with height interpreted as natural. Visible on the MBES dataset as an elongate mound. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	98	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7129	Dark reflector	603541	6149170	A2	4.0	1.1	0.4	-	Identified in the SSS dataset as a distinct, lozenge-shaped, angular dark reflector with a short shadow. Observed in the MBES dataset as a small area of irregular seabed. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	98	0
7130	Rope/chain	603062	6148163	A2	180.3	1.1	0.5	-	Identified in the SSS dataset as a long, faint, linear bright reflector which runs alongside a series of equidistant dark reflectors with height measuring approximately 0.9 x 0.9 x 0.4 m. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Possibly a modern feature such as fishing gear and therefore may not be of archaeological interest. However, as this cannot be confirmed without further investigation, the feature has been retained as a precaution	-	99	40.649427
7131	Debris	603913	6147058	A2	22.3	1.9	1.1	-	Identified in the SSS dataset as a large, rectangular dark reflector measuring 4.4 x 1.9 x 1.1 , with a tall, tapered shadow. Along the north-west edge a curvilinear dark reflector extends 17.9 m to the north-west. This location was not directly covered by the MBES dataset or the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. May represent one, large, irregular object or a point contact with a separate but associated linear item of debris. Interpreted as possible debris.	-	100	248.654379
7132	Magnetic	603684	6146751	A2	-	-	-	497	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	101	0
7133	Magnetic	603895	6145785	A2	-	-	-	24	Identified in the Mag. dataset as a small, asymmetric dipole with peak and trough on one profile line. Appears complex in form, with multiple peaks. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	102	0
7134	Dark reflector	603917	6145283	A2	4.8	3.5	1.0	-	Identified in the SSS dataset as a relatively large, distinct dark reflector with a bright, tapered shadow. There is also a possible higher amplitude linear section within the feature. Visible on the MBES dataset as a large sub-rounded mound. Located within a distinct area of scour and isolated in an area of mobile sediments. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	102	0
7135	Dark reflector	604429	6144355	A2	1.9	1.3	0.7	-	Identified in the SSS dataset as a small dark reflector with a slightly irregular shadow. Visible on the MBES dataset as a large, slightly curved sub-rounded mound. One of a pair of objects with 7136, which is within 4 m. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	103	120.3713
7136	Dark reflector	604433	6144354	A2	2.6	1.2	0.4	-	Identified in the SSS dataset as a small, slightly irregular rounded dark reflector with a short rounded shadow. Visible on the MBES dataset as a large sub-rounded mound. One of a pair of objects with 7135, which is within 4 m. This feature is less distinct but still prominent. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	103	124.09009
7137	Wreck	604787	6143081	A1	62.1	26.3	1.1	-	Identified in the SSS dataset as a prominent, upright wreck, comprising a sharp outline with a spread of linear dark reflectors with shadows within the wreck boundary. The wreck appears relatively broken up but still confined within a clear boundary. A jagged shadow is visible at the southern edge, suggesting uneven height. No MBES or Mag. coverage. This is known by the UKHO as probably the wreck of the Morlaix (record 4367), a steel steamship built in 1911 which sunk on passage to Sunderland from Macduff due to a collision. Anomalies 7138 - 7139 are tagged as possible associated debris items.	WA 2007, UKHO 4367, NRHE 1381985 CANMORE 322866	104	216.046497

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7138	Debris	604783	6143103	A1	5.0	0.5	0.3	-	Identified in the SSS dataset as a short, straight linear dark reflector with a short, clear shadow, located within 4 m of wreck 7137. No MBES or Mag. coverage. Interpreted as possible wreck debris.	-	104	216.532254
7139	Debris	604813	6143057	A1	1.8	0.5	0.5	-	Identified in the SSS dataset as a very small, indistinct dark reflector partially obscured by the shadow of wreck 7137 and located within 4 m. A short tapered shadow is visible extending beyond the data extents, so the height measurement should be considered a minimum. This location was not directly covered by either the MBES of the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as possible wreck debris.	-	104	236.714842
7140	Rope/chain	604747	6143044	A2	20.7	0.3	0.1	-	Identified in the SSS dataset as a short, curved linear dark reflector with a very short shadow. This location was not directly covered by either the MBES of the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible length of rope or chain. Possibly associated with nearby wreck 7137 approximately 35 m north-east.	-	104	169.448417
7141	Dark reflector	605157	6141418	A2	2.6	0.3	-	-	Identified in the SSS dataset as a small, irregularly shaped dark reflector, possibly in a 'Y' shape. Isolated on the seabed and with no discernible height. Visible on the MBES dataset as a slightly elongate depression. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	106	0
7142	Dark reflector	605292	6141235	A2	2.7	0.6	0.8	-	Identified in the SSS dataset as a distinct, slightly elongate dark reflector with a bright, distinct shadow. Located within an area of disturbed sediment and is relatively isolated. Visible on the MBES dataset as a prominent, elongate mound. No corresponding Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	106	0
7143	Dark reflector	607711	6136170	A2	3.4	2.6	0.6	-	Identified in the SSS dataset as a distinct, slightly angular dark reflector with a relatively broad shadow, present within a small area of scour. Observed on the MBES data as a large sub-rounded mound located within a depression or encircling scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or item of debris.	-	112	0
7144	Debris	608670	6133607	A2	4.0	3.1	1.2	-	Identified in the SSS dataset as a slightly elongate, sub-angular dark reflector with a clear tapered shadow. Identified in an area of disturbed sediment, likely associated scour. Observed in the MBES data as a large sub-rounded mound set within an irregular depression or scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible item of debris.	-	115	0
7145	Dark reflector	608826	6133079	A2	2.4	1.1	1.3	-	Identified in the SSS dataset as a clear, distinct and slightly angular dark reflector with a tall tapered shadow. Observed in the MBES data as a distinct angular mound. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or item of debris, retained as a precaution due to height.	-	115	0
7146	Dark reflector	608908	6131713	A2	1.8	1.7	1.4	-	Identified in the SSS dataset as an indistinct, small rounded dark reflector with a clear, narrow shadow. Observed in the MBES data as a distinct large mound. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature, or item of debris, retained as a precaution due to height.	-	117	62.504363

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7147	Rope/chain	609775	6130062	A2	235.0	1.9	0.3	-	Identified in the SSS dataset as a very long, straight, discontinuous feature comprising a series of dark reflectors with shadows measuring approximately 1.8 x 1.8 x 0.3 m, with a faint, linear dark reflector joining them. This location was not directly covered by the MBES dataset or the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Possibly a modern feature such as fishing gear and therefore may not be of archaeological interest. However, as this cannot be confirmed without further investigation, the feature has been retained as a precaution.	-	119	52.415498
7148	Seabed disturbance	613799	6120416	A2	14.9	10.9	0.1	-	Identified in the SSS dataset as a seabed disturbance comprising an anomalous area of dark reflectors. Several small dark reflectors with slight shadow are visible within the feature. This location was not directly covered by the MBES or Mag. datasets. Interpreted as a possible natural feature or possible debris.	-	129	33.250608
7149	Magnetic	614815	6114036	A2	-	-	-	59	Identified in the Mag. dataset as a medium, positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	136	0
7150	Magnetic	615076	6112820	A2	-	-	-	21	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	137	0
7151	Magnetic	615218	6111714	A2	-	-	-	5	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	138	0
7152	Magnetic	615355	6110906	A2	-	-	-	5	Identified in the Mag. dataset as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	139	0
7153	Magnetic	615396	6110676	A2	-	-	-	5	Identified in the Mag. dataset as a small, negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	139	0
7154	Magnetic	615409	6110598	A2	-	-	-	15	Identified in the Mag. dataset as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	139	0
7155	Magnetic	615424	6110519	A2	-	-	-	22	Identified in the Mag. dataset as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	139	0
7156	Magnetic	615459	6110325	A2	-	-	-	6	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	139	0
7157	Magnetic	615662	6108348	A2	-	-	-	29	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	141	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7158	Wreck	616801	6103403	A1	24.6	10.7	2.5	-	Identified in the SSS dataset as a large, elliptical, distinct dark reflector, with some possible indistinct internal dark reflectors and a tall shadow across its extent. There are some surrounding possible related debris visible (7159 and 7160). Feature is identified in the MBES dataset as an elongate mound, oriented north to south on a relatively featureless area of seabed. Very little internal structure is visible, but an irregular mound is discernible in the northern extent of the wreck. The feature has associated scour along its eastern and western edges. This location was not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. No corresponding UKHO record, however the feature is situated 392 m south-west of a dead recorded wreck (UKHO 4547), which is situated outside of the geophysical data coverage. It is possible that this feature represents that wreck; however, based on the UKHO description, its dimensions are smaller than those of the feature identified here and therefore it is unlikely that they represent the same wreck. Feature interpreted as a previously unrecorded wreck.	-	146	0
7159	Debris field	616793	6103395	A1	25.6	12.6	0.0	-	Identified in the SSS dataset as an irregular area of seabed disturbance comprising small, indistinct dark reflectors surrounding the west edge of wreck 7158. The small, indistinct objects may represent partially buried individual debris items related to the nearby interpreted wreck. Visible in the MBES dataset as very small, angular mounds within scour caused by the wreck, measuring 0.8 x 0.8 m. This location was not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a seabed disturbance that may contain debris associated with wreck 7158.	-	146	0
7160	Debris field	616812	6103396	A1	48.4	20.1	1.4	-	Identified in the SSS dataset as an irregularly shaped area of dark reflectors, comprising a long, curvilinear dark reflector with slight shadow, that may be a rope or chain, surrounded by smaller dark reflectors. The feature is situated on the eastern edge of wreck 7158 and is likely related debris. Also identified in the MBES dataset as an irregular area of mounded objects. This location was not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a debris field associated with wreck 7158.	-	146	0
7161	Dark reflector	616830	6103342	A2	2.6	1.1	-	-	Identified in the SSS dataset as a small, indistinct dark reflector with no shadow visible. The feature is situated on a relatively flat and even area of seabed, 56 m south-east of wreck 7158 and may be related, although this is not certain. No corresponding MBES contact. This location was not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	146	0
7162	Dark reflector	616854	6103310	A2	2.2	0.8	0.1	-	Identified in the SSS dataset as a small, indistinct dark reflector, with very slight bright shadow visible. The feature is situated on a relatively flat and even area of seabed, 95 m south-east of wreck 7158 and may be related, although this is not certain. No corresponding MBES contacts and this location was not directly covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible natural feature or possible debris.	-	147	0
7163	Dark reflector	616847	6103114	A2	0.9	0.8	0.9	-	Identified in the SSS dataset as a small, indistinct angular dark reflector with a bright shadow. No corresponding MBES contact and this location was not directly covered by the Mag. dataset. Interpreted as a possible natural feature or possible debris.	-	147	0
7164	Magnetic	617619	6097962	A2	-	-	-	29	Identified in the Mag. dataset as a small, symmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	152	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7165	Wreck	617891	6097823	A1	19.6	5.7	4.0	-	Identified in the SSS dataset as a slightly dispersed area of dark reflectors of varying size with bright, irregular shadows, possibly indicating uneven height. The feature is relatively isolated on a featureless area of seabed. This location was not directly covered by the MBES dataset, nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Associated with UKHO record 4248, the wooden hulled fishing vessel Eventide which sunk on 19 June 1976. The wreck has previous geophysical survey dimensions of 24 x 5 x 7.9 m and is recorded as being partially buried with a probable mast visible. Differences in dimensions may represent either disintegration of the wreck or possible partial burial.	UKHO 4248, WA 2010	152	15.111868
7166	Dark reflector	617229	6094357	A2	3.4	2.4	0.3	-	Identified in the SSS dataset as an angular dark reflector within a slight depression, the feature is possibly segmented, with some shadow. This location was not directly covered by the MBES dataset, nor was it covered by the Mag. dataset, so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as possible debris or a natural feature.	-	156	17.098269
7167	Magnetic	617486	6094020	A2	-	-	-	16	Identified in the Mag. dataset as a small, symmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	156	0
7168	Magnetic	617451	6093010	A2	-	-	-	16	Identified in the Mag. dataset as a small, asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	157	0
7169	Magnetic	617431	6092671	A2	-	-	-	10	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	157	0
7170	Dark reflector	617470	6091202	A2	3.8	1.4	0.1	-	Identified in the SSS dataset as a small curved dark reflector with a slight shadow. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	159	0
7171	Magnetic	617355	6090534	A2	-	-	-	34	Identified in the Mag. dataset as a small, asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	159	0
7172	Wreck	617095	6090068	A1	19.8	5.9	1.6	-	Identified in the SSS dataset as an elongate feature with a large, bright shadow. The object appears intact, with internal structure visible as two rectangular sunken features. An irregular area of disturbed seabed, perhaps representing buried debris, is visible along the eastern edge (7173). Also identified in the MBES dataset as a large mound, oriented NNW-SSE on the seabed. Some possible scour is visible on its eastern edge. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Associated with UKHO record 5729, an unknown wreck, recorded as having an angular structure with possible lattice construction, although a later survey in 1988 suggested that it may not be a wreck but instead a item of lost deck cargo or a prefabricated section of an offshore installation. Based on this later survey, it should be noted that this is possibly a modern debris item and therefore of no archaeological interest. However, due to its form in the geophysical data, and the fact the feature has not been ground-truthed by divers or ROV, it has been retained as a possible wreck as a precaution.	UKHO 5729, WA 2011	160	0
7173	Debris field	617100	6090075	A1	10.9	2.5	-	-	Identified in the SSS dataset as a disturbed area of seabed, visible as an irregular area of dark reflectors in a slight depression. The feature is situated on the eastern edge of feature 7172 and may be related. No associated MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as an area of seabed disturbance possibly containing debris associated with wreck 7172.	-	160	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7174	Dark reflector	617150	6089881	A2	2.3	1.8	0.4	-	Identified in the SSS dataset as a small, elongate dark reflector, possibly hollow, with a slight shadow. Also identified in the MBES dataset as a distinct rounded mound, set within encircling scour or a depression. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible item of debris or a natural feature.	-	160	0
7175	Dark reflector	616338	6087370	A2	3.5	3.8	0.3	-	Identified in the SSS dataset as a small, very thin, circular dark reflector with slight shadow. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	163	0
7176	Dark reflector	615620	6086748	A2	2.4	1.6	0.6	-	Identified in the SSS dataset as a small, sub-angular dark reflector that is slightly elongate, with a bright shadow. Observed on the MBES data as a rounded mound set within a deep encircling scour or depression. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as possible debris or a natural feature.	-	164	0
7177	Magnetic	615779	6086655	A2	-	-	-	14	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	164	0
7178	Seabed disturbance	615909	6086303	A2	13.7	7.8	1.2	-	Identified in the SSS dataset as an irregular area of small dark reflectors with bright, slightly tapered shadow. This location was not directly covered by the MBES dataset, nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as possible debris or a natural feature.	-	164	45.108733
7179	Magnetic	615361	6085904	A2	-	-	-	9	Identified in the Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	164	0
7180	Debris	615208	6085131	A1	4.8	2.0	-	-	Identified in the SSS dataset as a small, slightly curved area of dark reflectors with no obvious shadow. The feature is situated 8 m north-east of wreck 7181 and may be associated debris. This location was not directly covered by the MBES dataset; nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as probable wreck debris.	-	165	5.614206
7181	Wreck	615196	6085125	A1	10.5	4.7	3.0	-	Identified in the SSS dataset as a distinct, elongate feature that appears to be the hull of a wreck. The wreck has defined edges and a varying bright shadow, possibly suggesting uneven height, with one very tall shadow indicating upstanding debris. Several possible items of debris surround the wreck (7180, 7182, 7183, 7184). The wreck is observed in the MBES data as an elongate mound orientated north-east to south-west, with tall, irregular features. The wreck has associated scour extending to the north-west measuring 20.4 x 17.2 x -0.2 m and narrowing as it extends. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Associated with UKHO record 5680, an unknown wreck of unknown date, described as being intact, lying on its side with wheelhouse clearly visible. The wreck has previous survey dimensions of 10.9 x 4.3 x 6.7 m.	UKHO_5680, WA 2014	165	0
7182	Debris	615204	6085124	A1	1.2	0.7	2.2	-	Identified in the SSS dataset as a small, indistinct dark reflector with a very tall, bright shadow. The feature is located adjacent to the eastern edge of wreck 7181, and is partially obscured. This location was not directly covered by the MBES dataset; nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as probable wreck debris	-	165	5.541388
7183	Debris	615204	6085118	A1	1.5	0.4	0.6	-	Identified in the SSS dataset as a small dark reflector with slightly flared bright shadow. This location was not directly covered by the MBES dataset; nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Located 9 m south-east of the wreck 7181 and possibly associated. Interpreted as probable wreck debris.	-	165	8.471048

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7184	Debris	615196	6085093	A1	1.7	0.8	0.5	-	Identified in the SSS dataset as a small outline of an elongate object, with a slightly angular bright shadow. This location was not directly covered by the MBES dataset; nor was it covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Located 26 m south of wreck 7181 and possibly associated. Interpreted as possible wreck debris.	-	165	13.696456
7185	Dark reflector	614062	6083471	A2	2.8	1.4	-	-	Identified in the SSS dataset as an irregular, slightly angular dark reflector with an elongate protrusion and no discernible height. Also visible as a slight mound in a depression in the MBES dataset. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present at this location. Interpreted as a possible item of debris or a natural feature.	-	167	0
7186	Magnetic	613615	6082798	A2	-	-	-	49	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	168	0
7187	Debris	613228	6082639	A1	1.8	0.3	0.3	-	Identified in the SSS dataset as a distinct, elongate dark reflector with a bright, tapered shadow. Located 10 m from the north-eastern end of the wreck 7191 and may be associated. Visible as a small mound MBES dataset. No associated Mag. anomaly. Interpreted as possible wreck debris.	-	168	0
7188	Debris	613208	6082646	A1	3.3	0.9	0.3	-	Identified in the SSS dataset as an irregularly shaped dark reflector adjacent to wreck 7191. No corresponding MBES contacts and no Mag. coverage. Interpreted as possible wreck debris.	-	168	0
7189	Rope/chain	613227	6082628	A1	13.2	0.2	0.1	-	Identified in the SSS dataset as a curvilinear dark reflector with height, extending east from wreck 7191. No corresponding MBES or Mag. contacts, although any magnetic signature may be masked by the larger wreck response. Interpreted as a possible length of rope or chain associated with the wreck.	-	168	0
7190	Debris field	613221	6082624	A1	4.6	4.3	0.3	-	Identified in the SSS dataset as a possible debris field identified along one side of wreck 7191, comprising a series of linear dark reflectors. No corresponding MBES or Mag. contacts, although any magnetic signature may be masked by the larger wreck response. Interpreted as possible wreck debris.	-	168	0
7191	Wreck	613200	6082613	A1	80.3	35.0	5.3	1678	Identified in the SSS dataset as a large broken-up wreck with a relatively defined outline lying upright and orientated north-east to south-west, comprising numerous linear, sub-angular and irregular dark reflectors and objects with height, including one particularly tall object at one end and a possible slatted deck features. Some sediment build-up is visible on the western side and some apparent scour immediately adjacent to the wreck on the east side, narrow on the southern half and broader on the northern half. Visible in the MBES dataset as a partially broken up wreck with some sediment build-up on the western side and apparent scour along the eastern edge. Associated with a very large, sharp asymmetric dipole in the Mag. dataset, suggesting ferrous build or contents. The dispersed wreck is located within a wider boulder field and as such there is potential for further debris to be located in the vicinity. Associated with UKHO record 5672, possibly the wreck of the Saga, a Norwegian cargo vessel operating under the British Flag. Torpedoed by a German submarine in February 1918. It is listed as a dangerous wreck, having dimensions of 75.8 x 20.2 x 6.3 m and as being well broken up but with clearly discernible features. Associated with surrounding possible debris items 7187, 7188, 7189, 7190, 7192, 7193, 7194, 7195.	UKHO 5672, NRHE 1607031, WA 2016	168	0
7192	Debris	613205	6082580	A1	4.3	0.2	0.2	-	Identified in the SSS dataset as a linear dark reflector with height in an 'L' shape situated approximately 9 m from wreck 7191. No corresponding MBES or Mag. contacts, although any magnetic signature may be masked by the larger wreck response. Interpreted as possible wreck debris.	-	168	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7193	Debris	613193	6082580	A1	2.3	0.3	0.2	-	Identified in the SSS dataset as a short linear dark reflector with height identified adjacent to one end of wreck 7191, which appears to bend at an angle at one end. No corresponding MBES or Mag. contacts, although any magnetic signature may be masked by the larger wreck response. Interpreted as possible wreck debris.	-	169	0
7194	Debris	613188	6082576	A1	6.9	1.1	0.3	-	Identified in the SSS dataset as two parallel, linear dark reflectors with height. Possibly two sides of one object or two separate but associated features. Located adjacent to wreck 7191. No corresponding MBES or Mag. contacts, although any magnetic signature may be masked by the larger wreck response. Interpreted as possible wreck debris.	-	169	0
7195	Debris	613176	6082570	A1	2.3	0.5	0.5	-	Identified in the SSS dataset as a short, linear dark reflector with height approximately 10 m from wreck 7191. No corresponding MBES or Mag. contacts, although any magnetic signature may be masked by the larger wreck response. Interpreted as possible wreck debris.	-	169	0
7196	Magnetic	613407	6082428	A2	-	-	-	105	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No associated SSS or MBES anomalies. Interpreted as possible ferrous debris either buried or with no surface expression.	-	168	0
7197	Dark reflector	613567	6082300	A2	1.9	1.1	2.1	-	Identified in the SSS dataset as an indistinct dark reflector with long tapering shadow. Also visible in the MBES dataset as a mound measuring 3.6 x 1.5 x 0.5 m, it appears to have been dragged along the seabed, causing a scar which may have resulted in the height measurement appearing to be exaggerated in the SSS data. No corresponding Mag. contact. Interpreted as a possible item of debris or a natural feature.	-	168	0
7198	Magnetic	613099	6082217	A2	-	-	-	295	Identified in the Mag. dataset as a large, sharp positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	169	0
7199	Dark reflector	612946	6082145	A2	1.9	0.9	0.1	-	Identified in the SSS dataset as an elongate, slightly oval dark reflector that appears to be hollow in its centre. Identified close to an area of numerous boulders. Observed in the MBES dataset as a low sub-rounded mound with some slight encircling scour extending for 0.8 m. No corresponding Mag. anomaly. Interpreted as a possible natural feature or possible debris.	-	169	0
7200	Rope/chain	613054	6082068	A2	5.9	0.2	0.0	-	Identified in the SSS dataset as a relatively short curvilinear dark reflector identified in an area of numerous boulders. An object with height is observed at one end, however there are numerous similar features in the area and it is not obviously associated. No corresponding MBES or Mag. contacts. Interpreted as possible short length of rope or chain.	-	169	0
7201	Rope/chain	613154	6082017	A2	23.0	0.4	0.1	-	Identified in the SSS dataset as a curvilinear dark reflector with height identified in an area of numerous boulders. No corresponding MBES or Mag. contacts. Interpreted as a possible length of rope or chain.	-	169	62.822766
7202	Rope/chain	612783	6081893	A2	6.6	0.3	0.1	-	Identified in the SSS dataset as a faint, curvilinear dark reflector with height identified close to an area of numerous boulders, likely outcropping. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible length of rope or chain.	-	169	24.021749
7203	Dark reflector	612381	6082289	A2	2.2	1.1	1.3	-	Identified in the SSS dataset as a distinct, irregular and poorly defined dark reflector with a long, narrow, tapered shadow. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or possible debris.	-	169	1.87376

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7204	Dark reflector	612233	6082184	A2	1.5	1.2	0.3	-	Identified in the SSS dataset as a small rounded dark reflector with a bright shadow and some possible associated scour. Observed in the MBES dataset as a two small rounded mounds, with the largest measuring 1.2 x 1.0 x 0.1 m. No corresponding Mag. anomaly. Interpreted as a possible natural feature or possible debris.	-	170	0
7205	Debris	612061	6082022	A2	2.0	1.9	0.5	-	Identified in the SSS dataset as an angular dark reflector in a diamond shape with a very distinct outline and a slightly irregular internal section. Two linear reflectors extend out from the feature at rough right angles (7206 and 7207). Visible in the MBES dataset as a large, irregular mound. No corresponding Mag. coverage. Interpreted as possible debris.	-	170	0
7206	Rope/chain	612054	6082021	A2	11.7	1.1	-	-	Identified in the SSS dataset as a faint, poorly defined dark reflector extending north-west out from possible debris 7205 at a rough right angle, with no discernible height. Visible in the MBES dataset as a slight curvilinear mound. No corresponding Mag. coverage. Interpreted as a possible rope or chain or item of linear debris associated with 7205.	-	170	0
7207	Rope/chain	612059	6082014	A2	12.5	0.7	-	-	Identified in the SSS dataset as a linear bright reflector extending south from possible debris 7205 at a rough right angle. No corresponding MBES contacts and no Mag. coverage. Interpreted as a possible rope or chain or item of linear debris associated with 7205.	-	170	0
7208	Mound	612141	6081884	A2	1.7	1.5	0.2	-	Identified in the MBES dataset as an irregular mound with a high point to the south-west and a lower, linear protrusion extending to the north-east. Identified towards the edge of the survey area so unsure if truly isolated, but appears distinct in the surrounding seabed. No corresponding SSS contacts and no Mag. coverage. Interpreted as a possible natural feature or may be possible debris.	-	170	0
7209	Magnetic	612171	6081768	A2	-	-	-	49	Identified in the Mag. dataset as a small, positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	170	0
7210	Rope/chain	611659	6081851	A2	51.3	0.6	0.1	-	Identified in the SSS dataset as a linear dark reflector with slight height identified in an area of outcropping geology. Observed in the MBES dataset as an indistinct linear mound on an approximate north-west to south-east alignment. No corresponding Mag. anomaly. Interpreted as a possible length of rope or chain.	-	170	0
7211	Magnetic	611061	6081518	A2	-	-	-	383	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris either buried or with no surface expression.	-	171	0
7212	Seabed disturbance	610539	6081448	A2	17.7	9.8	1.7	-	Identified in the SSS dataset as a mound comprising numerous small dark reflectors. Appears different to other seabed disturbances/outcropping seen in the area. Visible on the MBES dataset as a large, irregular mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	-	171	0
7213	Dark reflector	610007	6081192	A2	1.1	0.6	0.7	-	Identified in the SSS dataset as an angular dark reflector with a relatively broad, bright reflector. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	172	0
7214	Dark reflector	610009	6081184	A2	1.0	0.8	0.4	-	Identified in the SSS dataset as a round dark reflector with a bright shadow. No corresponding MBES contact. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible natural feature or possible debris.	-	172	0
7215	Bright reflector	610332	6080976	A2	1.0	1.0	-	-	Identified in the SSS dataset as a circular bright reflector with a dark reflector in its centre. No corresponding MBES contact or Mag. anomaly. Interpreted as a possible natural feature or possible debris.	-	172	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7216	Rope/chain	610215	6080877	A2	186.0	0.9	-	-	Identified in the SSS dataset as a series of poorly defined dark reflectors with no discernible height measuring approximately 1.0 x 0.7 m, possibly joined by a very faint linear dark reflector. Observed in the MBES dataset as a series of small mounds. There are 20 visible, on a curved north-east to south alignment and spaced approximately 12 m apart. No corresponding Mag. anomaly. Possibly a modern feature such as fishing gear and therefore may not be of archaeological interest. However, as this cannot be confirmed without further investigation, the feature has been retained as a precaution.	-	172	0
7217	Rope/chain	610314	6080677	A2	16.1	0.6	0.1	-	Identified in the SSS dataset as a linear dark reflector with slight, intermittent height. Identified in an area of outcropping bedrock, however appears perpendicular to natural formations. Observed in the MBES dataset as a distinct linear mound on an approximate north-east to south-west alignment with no associated scour. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Interpreted as a possible length or rope or chain, although may be a linear item of debris.	-	172	122.314355
7218	Rope/chain	609530	6080513	A2	29.8	1.1	1.0	-	Identified in the SSS dataset as an intermittent, slightly wavy linear dark reflector with occasional height. Identified in an area of outcropping bedrock. An angular dark reflector with height is visible at the western end, measuring 1.8 x 1.1 x 1.0 m, which may be associated although this is not definitive. Observed in the MBES dataset as an indistinct linear mound on an east to west alignment. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Feature appears to be a continuation of 7219, located approximately 20 m to the east. Interpreted as a possible length of rope or chain.	-	173	0
7219	Rope/chain	609586	6080511	A2	38.3	0.3	0.1	-	Identified in the SSS dataset as a slightly intermittent, slightly wavy linear dark reflector with occasional height. Identified in an area of outcropping bedrock. Observed in the MBES dataset as an indistinct linear mound on an east to west alignment. This location was not directly covered by the Mag. dataset so it is not possible to ascertain whether ferrous material is present in this area. Feature appears to be a continuation of 7218, located approximately 20 m to the west. Interpreted as a possible length of rope or chain.	-	173	0
7220	Dark reflector	608655	6080420	A2	1.0	0.8	1.0	-	Identified in the SSS dataset as a small, angular, elongate dark reflector with long straight-sided shadow and possible rounded scour, distinct from an otherwise featureless seabed. Visible in the MBES dataset as a distinct, elongate mound, with possible scour to the south-east. No corresponding Mag. contacts. Interpreted as possible non-ferrous debris.	-	174	0
7221	Magnetic	608457	6080502	A2	-	-	-	28	Identified in the Mag. dataset as a small, asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	174	0
7222	Dark reflector	608413	6080259	A2	1.2	0.2	0.1	-	Identified in the SSS dataset as a small, elongate, poorly-defined dark reflector and a short, rounded shadow. Slightly distinct from otherwise featureless seabed. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	-	174	0
7223	Debris	608013	6079989	A2	4.0	2.1	0.8	-	Identified in the SSS dataset as a large, irregularly-shaped, elongate dark reflector with long broad asymmetrically tapered shadow, rounded at one end. Visible in the MBES dataset as a distinct mound set within encircling scour or depression that is more pronounced to the south and west. No corresponding Mag. contacts. Interpreted as possible non-ferrous debris.	-	174	0
7224	Dark reflector	607892	6080298	A2	3.1	1.7	0.5	-	Identified in the SSS dataset as a small, irregular, sub-rounded dark reflector with a broad, tapered shadow, approximately 15 m ENE of large rocky outcrop. Visible in the MBES dataset as a small mound. No corresponding Mag. Contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	-	174	16.068647

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7225	Magnetic	607925	6080025	A2	-	-	-	139	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough over two profile lines. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	174	0
7226	Magnetic	607852	6080227	A2	-	-	-	12	Identified in the Mag. dataset as a small, asymmetric dipole with peak and trough over two profile lines. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	174	0
7227	Debris	607767	6080160	A2	3.6	1.4	0.3	25	Identified in the SSS dataset as a fairly distinct sub-rounded dark reflector isolated in an area of relatively clear seabed. Visible on the MBES dataset as a distinct sub-rounded mound. Associated with a small asymmetric dipole with peak and trough on one profile line visible on the Mag. dataset. Interpreted as a possible ferrous debris.	-	175	0
7228	Magnetic	607903	6079869	A2	-	-	-	158	Identified in the Mag. dataset as a large, sharp positive monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	174	0
7229	Magnetic	607759	6080057	A2	-	-	-	51	Identified in the Mag. dataset as a medium, negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	0
7230	Magnetic	607807	6079958	A2	-	-	-	348	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	0
7231	Magnetic	607367	6080126	A2	-	-	-	20	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. One of a line of three anomalies with 7232 and 7233 running NE-SW for approximately 100 m, which may be related. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	64.300583
7232	Magnetic	607348	6080088	A2	-	-	-	16	Identified in the Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines. One of a line of three anomalies with 7231 and 7233 running NE-SW for approximately 100 m, which may be related. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	36.829099
7233	Magnetic	607313	6080048	A2	-	-	-	46	Identified in the Mag. dataset as a small, sharp asymmetric dipole with peak and trough on one profile line. One of a line of three anomalies with 7231 and 7232 running NE-SW for approximately 100 m, which may be related. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	13.80844
7234	Dark reflector	607473	6079767	A2	2.4	0.4	-	-	Identified in the SSS dataset as an irregular, slightly 'v' shaped dark reflector of variable width, with no apparent shadow. Slightly distinct within a relatively featureless seabed. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	-	175	0

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7235	Wreck	607303	6080190	A1	12.1	5.8	0.7	-	Identified in the SSS data as an elongate area of high reflectivity with slight height and a single distinct dark reflector with height at its centre. Feature is outside of the MBES and Mag. data coverage. The closest Mag. line was approximately 13 m to the south and no magnetic anomaly was identified, suggesting the feature does not contain a significant amount of ferrous material. Feature corresponds with the UKHO record 89472 of an unknown wreck discovered in 2018 during a MBES survey. In the UKHO record, the feature is described as a dangerous wreck, lying on its side measuring 18.3 x 5.5 x 0.8 m and orientated 050/230 degrees in a general depth of 10 m. Although the feature appears slightly anomalous in the SSS data, it does not appear to be an obvious wreck and may instead represent an area of natural outcropping. However, the feature has been retained as a precaution based on its anomalous form and classified as a wreck based on the UKHO information.	UKHO 89472, WA 2017	175	148.307181
7236	Magnetic	607389	6079715	A2	-	-	-	24	Identified in the Mag. dataset as a small, asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	0
7237	Magnetic	607179	6079982	A2	-	-	-	67	Identified in the Mag. dataset as a medium, sharp symmetric dipole with peak and trough on one profile line. Also visible on other profile lines. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	5.79921
7238	Magnetic	607026	6079792	A2	-	-	-	59	Identified in the Mag. dataset as a medium asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	0
7239	Magnetic	606976	6079888	A2	-	-	-	74	Identified in the Mag. dataset as a medium, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	175	0
7240	Debris field	606618	6079955	A1	49.4	18.8	0.2	9783	Identified in the SSS data as a large area containing numerous dark reflectors, including linear features, some of which appear elongate and slatted in form. Feature is identified in an area of outcropping geology and therefore it is not always distinct from the background natural features. Some data distortion is observed towards the outer data extents, so dimensions may not be accurate. Possibly related to nearby features 7241 and 7242. Identified at the location of a very large magnetic anomaly along with features 7241 and 7242 and likely associated, although due to the area of magnetic variation, it is not possible to discern whether the magnetic anomaly relates to one or all of the features. The feature is located close to an area of foul ground marked on the admiralty chart and is therefore potentially related; however, as this cannot be confirmed without further investigation, the feature has been retained as a feature of archaeological potential. It should also be noted that the feature is also located approximately 350 m south-west of UKHO record 57777, which is that of the steamship Norman which sank in 1881 after becoming stranded. Although this wreck is currently recorded by the UKHO as a dead wreck, previous investigations suggested the wreck was identified as a few pieces of scattered iron in an area of rocky ground with very little recognisable structure. Possible ferrous debris field which has the potential to be a dispersed area of wreckage, possibly related to UKHO record 57777, or modern items of debris.	-	176	65.427057
7241	Debris	606590	6079939	A1	1.5	1.3	0.6	9783	Identified in the SSS dataset as a small, angular rhomboidal dark reflector with long irregular shadow, situated within small area of featureless seabed surrounded by rocky outcrops. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible debris related to nearby debris field 7240 and debris item 7242 approximately 10 m away. Identified at the location of a very large magnetic anomaly along with features 7240 and 7242 and likely associated, although due to the area of magnetic variation, it is not possible to discern whether the magnetic anomaly relates to one or all of the features. The feature is located close to an area of foul ground marked on the admiralty chart and is therefore potentially related; however, as this cannot be confirmed without further investigation, the feature has been retained as a feature of archaeological potential. Possibly related to nearby features 7240 and 7242. Possible ferrous debris.	-	176	53.376412

ID	Classification	Easting	Northing	Archaeological discrimination	Length (m)	Width (m)	Height (m)	Magnetic amplitude (nT)	Description	External References	Nearest KP	Distance to MIC (m)
7242	Debris	606584	6079931	A1	5.4	0.5	0.5	9783	Identified in the SSS dataset as a long, narrow, elongate dark reflector with indistinct boundaries and long tapered shadow, oriented approximately north-east to south-west. A small elongate, angular dark reflector with short rounded shadow is located at a right angle adjacent to this feature and may be attached. Situated in an area surrounded by rocky outcrops. Identified at the location of a very large magnetic anomaly along with features 7240 and 7241 and likely associated, although due to the area of magnetic variation, it is not possible to discern whether the magnetic anomaly relates to one or all of the features No corresponding MBES contacts. Interpreted as possible ferrous debris. The feature is located close to an area of foul ground marked on the admiralty chart and is therefore potentially related; however, as this cannot be confirmed without further investigation, the feature has been retained as a feature of archaeological potential. Likely related to nearby features 7240 and 7241. Possible ferrous debris.	-	176	46.265024
7243	Magnetic	606670	6079578	A2	-	-	-	92	Identified in the Mag. dataset as a medium, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	176	0
7244	Dark reflector	606505	6079862	A2	4.4	0.1	-	-	Identified in the SSS dataset as an distinct, angular, elongate dark reflector with no apparent shadow. This feature is oriented NNW-SSE and is distinct from surrounding seabed. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	-	176	0
7245	Magnetic	606532	6079629	A2	-	-	-	212	Identified in the Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	176	0
7246	Magnetic	606501	6079604	A2	-	-	-	66	Identified in the Mag. dataset as a medium, negative monopole with peak and trough on one profile line. No corresponding MBES or SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	-	176	0

Appendix E Maritime Recorded Losses

NRHE ID	Canmore ID	HER ID	Name	Type	Year Lost	Description
NRHE_1391879	-	SMR_15043	WILLIAN AND JANE	Cargo vessel	1793	Wreck of British cargo vessel which foundered a little north of Souter Point following a collision with the GARLAND on her passage from Newcastle-upon-Tyne with coal.
-	CANMORE_327686	MEL10632	SUSANNAH	Cargo vessel	1806	Cargo vessel wrecked in 1806 at Thortonloch.
-	CANMORE_329683	MEL10668	BARBARA	Vessel	1807	Vessel lost in 1807 at Thortonloch.
-	CANMORE_326813	MEL10512	AIMABLE	Vessel	1810	French vessel lost in 1810.
NRHE_1315910	-	-	Unknown	Cargo vessel	1829	1829 wreck of cargo vessel which foundered off Souter Point. Wooden sailing vessel possibly laden with wine. Location given the same as the William and Jane.
-	CANMORE_197021	-	HYTHE	Brig	1841	Brig lost in 1841 off Eyemouth.
-	CANMORE_246913	-	AGENORIA	Brig	1847	19th century brig lost in 1847.
NRHE_1362417	-	SMR_15052	TOPHILL	Sloop	1852	Run down off Souter Point by the Blyth-registered sailing vessel WIDRINGDON in 1852. Sailing sloop.
-	CANMORE_326380	MEL10719	EARLY	Vessel	1855	Vessel lost in 1855 at Thortonloch.
-	-	MEL10631	UNKNOWN	Unknown	1864	-
NRHE_996874	-	SMR_14062	EDWARD AND JAMES	Vessel	1867	English Dandy sunk 1867. Foundered following collision with the ZEPHYR, of Montrose.
-	-	MEL10552	UNKNOWN	Unknown	1872	Lost in 1872.
NRHE_1365130	-	SMR_15051	PREMIER	Sloop	1876	Sloop foundered and lost off Souter Point in wind conditions S force 5, 1876.
NRHE_1365323	-	SMR_15047	HANNAH	Schooner	1884	Schooner foundered and lost following collision with the Sunderland registered S.S KEPIER in wind and foggy conditions, 1884.
-	CANMORE_199485	-	I	Steam ship	1893	Iron steam lighter sunk in 1893.

NRHE ID	Canmore ID	HER ID	Name	Type	Year Lost	Description
-	CANMORE_119981	MEL2395	CYDUM	Schooner	1898	Wreck of schooner, 1898.
NRHE_1365619	-	SMR_14058	PINTA	Brig	1898	English Brig, 1896. Vessel foundered and lost following collision in wind conditions SW force 5 with the West Hartlepool-registered SS PICTON.
NRHE_1365953	-	SMR_14676	QUICKSTEP	Tug Boat	1899	English tug which foundered and lost in wind conditions N force 1, following collision with the Sunderland registered S. S. BROOKSIDE 1899.
-	CANMORE_325492	MEL10504	YDUN (YOUN ?) (CYDUM ?)	Screw Steamer	1905	Wooden screw steamer lost in 1905 whilst in ballast. Stranded and wrecked at Lunciwick, near Thorntonloch.
NRHE_908777	-	SMR_13982	RECORDER	Fishing vessel	1915	Sunk by bombs from German submarine UB18 15-16 miles NE of the Tyne, 1915. The fishing trawler was captured by a German submarine, her crew forced to abandon ship without loss of life, after which she was sunk by explosive scuttling charges.
-	CANMORE_201130	MEL10615	SPARTAN	Ketch	1916	Wooden ketch stranded in 1916.
NRHE_1367108	-	SMR_14670	NARCISSUS	Fishing vessel	1917	This fishing trawler was stopped and captured by a German submarine, her crew forced to abandon ship, after which she was sunk by explosive scuttling charges in 1917.
-	-	SMR_13855	ELTERWATER	Steam ship	08.08.1927	A steamship which ran aground 8th August 1927. Now lies at a depth of 5m. The wreck has been heavily salvaged.
NRHE_908725	-	-	GRIT	Cargo vessel	1943	Remains of the 1943 wreck of an English cargo vessel located approximately 6.1 nautical miles east of Souter Point. The GRIT was a steel-hulled cargo vessel. Outside corridor on UKHO record.
NRHE_908629	-	-	STAG 5	Tug Boat	1950	Possible remains of the 1950 wreck of an English steam tug located approximately 6 nautical miles ENE of Roker Light, Sunderland. The STAG 5 foundered after capsizing while towing the newly built steamship CITY OF MANCHESTER from Wallsend to the River We
-	CANMORE_324692	-	POWERBOAT MAGAZINE	Speedboat	1969	Speedboat lost in 1969.
-	CANMORE_325062	-	FOUR SEASONS	Unknown	1975	Craft (Possibly). On edge of UKHO 63946 location. Sunk in 1975.

NRHE ID	Canmore ID	HER ID	Name	Type	Year Lost	Description
-	CANMORE_195902	MEL10505	FRIENDSHIP	Brig	Unknown	18th century brig.
-	CANMORE_246918	-	JOHNS	Unknown	Unknown	19th century craft.
-	CANMORE_201817	-	ROSSO	Steam ship	Unknown	20th century steam ship.
NRHE_1003747	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003746	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003744	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003745	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003748	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003925	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003917	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003913	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003916	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003910	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003915	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003914	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1004060	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.

NRHE ID	Canmore ID	HER ID	Name	Type	Year Lost	Description
						Possible debris from the wreck of the GRIT (UKHO 5736) and linked to 908725
NEHE_1313338	-	SMR_14681	JANET AND MARY	Brig	Unknown	Vessel foundered off Souter Point in wind conditions W force 4 whilst under tow. Brigantine-rigged sailing lighter.
NRHE_1312886	-	SMR_15050	PHOENIX	Schooner	Unknown	Run down off Souter Point by the Blyth-registered sailing vessel WIDRINGDON. Sailing schooner.
NRHE_1365497	-	SMR_15049	OSPREY	Vessel	Unknown	Vessel foundered and lost offshore, following collision with the Aberdeen-registered SS SPRAY.
NRHE_1313236	-	SMR_15048	M	Vessel	Unknown	Vessel foundered and lost in wind conditions NNW force 9, whilst carrying 200 tons of cargo in chequers and bulk, secured only by their own weight. During the gale the M broke her tiller, her stern post was started, her hatches stove in by a heavy sea, so that she became unmanageable and had to be abandoned. Sailing sloop.
NRHE_908633	-	-	Unknown	Vessel	Unknown	REMAINS OF UNIDENTIFIED VESSEL. Close to UKHO_5729 and NRHE_1004050
NRHE_1004050	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1004056	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1004035	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1004021	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1004019	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature. Close to Blue Dawn (UKHO 64121)
NRHE_1004015	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1004000	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.

NRHE ID	Canmore ID	HER ID	Name	Type	Year Lost	Description
NRHE_1001755	-	-	Unknown	Cargo vessel	Unknown	Upright and partially intact remains of a wreck located 3.8 nautical miles NE of Seaham Harbour. The wreck is believed to be a cargo vessel of the First World War era. Possibly SAGA in UKHO, and within corridor, or ELFI in NRHE, and outside corridor.
NRHE_1003960	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003950	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003946	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature. Possibly debris from the SAGA (UKHO 5672) or NRHE 1001755
NRHE_1003961	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003951	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.
NRHE_1003959	-	-	Unknown	Obstruction	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.

Appendix F OASIS Record Form

